



# Review of Environmental Factors February 2018

Upgrade to existing boat ramp and associated  
vehicular access and parking arrangements



PO Box 492, Bega NSW 2550  
**P.** (02) 6499 2222  
**F.** (02) 6499 2200  
**E.** [council@begavalley.nsw.gov.au](mailto:council@begavalley.nsw.gov.au)  
**W.** [begavalley.nsw.gov.au](http://begavalley.nsw.gov.au)  
**ABN.** 26 987 935 332  
**DX.** 4904 Bega

## Contents

Contents.....	1
1. Introduction .....	3
2. Existing Site Features.....	4
Function/ Usage.....	4
Boat Ramp .....	4
Pontoon/ Jetty.....	4
Access .....	4
Launching Area .....	4
Vehicle/ Trailer Parking .....	4
Fish Cleaning Facilities.....	5
Engine Flush/ Boat Wash Facilities.....	5
Public Toilets .....	5
Waste Disposal .....	5
Signage.....	5
Other.....	5
3. NSW Boating Now Funding Approved Scope of Works .....	6
4. Existing Environment.....	6
General Description.....	6
Flora .....	6
Fauna.....	7
Geology .....	8
Heritage .....	8
Socio-Economic.....	8
4. Legislation and Policy Requirements .....	9
Legislative Requirements.....	9
NSW Crown Land/ NSW Land and Property Management Authority.....	9
State Environment Planning Policy (Infrastructure) 2007 .....	9
Bega Valley Local Environment Plan, 2013.....	9
Biodiversity Conservation Act 2016 .....	9
Environmental Planning & Assessment Act, 1979 & EP&A Regulation 2000 .....	10
Protection of the Environment Operations Act, 1997 .....	10
National Parks & Wildlife Act 1974 (NPW Act) .....	10
Biosecurity Act 2015 .....	10
Fisheries Management Act 1994 .....	10
Roads Act NSW, 1993.....	11

Environmental Protection and Biodiversity Conservation Act 1999.....	11
NSW Coastal Policy 1997 .....	11
Heritage Act 1977 .....	11
5. Environmental Assessment.....	12
6. Conclusion.....	15
APPENDIX A. Environmental Impact Assessment .....	16
APPENDIX B. Assessment of Significance (Five Part Test) for Threatened Species or Endangered Ecological Communities.....	20
APPENDIX C. Maritime Design Documentation .....	22
APPENDIX D. Civil Design Documentation .....	32
APPENDIX E. Photographs of Existing Facilities .....	40
APPENDIX F. Threatened Entities Evaluation .....	43
Threatened Flora .....	43
Threatened and Migratory Fauna.....	50

## 1. Introduction

This Review of Environmental Factors (REF) has been prepared by the Bega Valley Shire Council (BVSC) to assess the actual and potential environmental impacts of the proposed boat ramp, vehicular access and parking upgrade at Beauty Point, pursuant to Part 5 of the *Environmental Planning and Assessment Act 1979*.

The Beauty Point boat ramp site is on Bega Valley Shire Council (BVSC) managed Crown Land at Wallaga Lake; Lot 246 DP 1127081.



Figure 1- Beauty Point Boat Ramp Location

The existing Beauty Point boat ramp is a two lane boat ramp of bitumen over compacted road base to the mean high water mark (MHW), then insitu sand/ shell grit into the water.

Funding has been secured under the NSW Roads and Maritime Services (RMS) "NSW Boating Now Program" to carry out the following broad scope of works at the site:

- Replacement of the existing gravel boat ramp with a new reinforced concrete double boat ramp;
- Enlargement and upgrade of the existing access road and boat launching area;
- Enlargement and formalisation of the car /trailer parking; and
- Upgrade of lighting.

## 2. Existing Site Features

### Function / Usage

The existing boat ramp provides access to Wallaga Lake - principally for recreational boating, water-skiing and recreational fishing.

Beauty Point experiences significant influx of visitors and tourists during holiday periods, with resultant high demand on existing boating infrastructure.

### Boat Ramp

The existing boat ramp is a two lane boat ramp of bitumen over compacted road base to the MHWL, then insitu sand / shell grit into lake. The gradient of the existing ramp is less than 20°.

### Pontoon / Jetty

A Bellingham concrete pontoon, installed in 2006, currently services the boat ramp. The pontoon consists of 3 pods anchored by 2 steel piles. Access to the pontoon is via an aluminium truss walkway from a rock pitched abutment.

The condition of the existing pontoon is good.

### Access

Existing access to the boat ramp is provided via a sealed road off Beauty Point Road. The road, however, is narrow and during high usage periods does not cater for boat preparation, queuing or two way traffic of vehicles and trailers.

Current local practice during high usage periods is for one-way traffic on the access road and using the unsealed road that follows the lake foreshore as a return loop back to Beauty Point Road - a distance of approximately 700m. The shoulders of the unsealed road are also used for vehicle and trailer parking during high usage periods, which further compounds congestion and traffic flow issues.

### Launching Area

The existing launching area consists of bitumen over compacted road base, and is simply an extension of the boat ramp. The surface/ pavement is of average condition. At present, there is very limited space to manoeuvre vehicles and trailers, no line marking or traffic flow directions.

### Vehicle / Trailer Parking

Vehicle/ trailer parking is located on the grassed area at the beginning of the access road. This area is of limited size and constrained by numerous large trees. The shoulders of the unsealed loop road are also used for vehicle and trailer parking during high usage periods.

Overall, the existing vehicle and trailer parking is inadequate and ad-hoc.



### **Fish Cleaning Facilities**

There are no fish-cleaning facilities at this location.

### **Engine Flush / Boat Wash Facilities**

There are no engine flush or boat washing facilities at this location.

### **Public Toilets**

Public toilets are located at the beginning of the access road in the vehicle / trailer parking area.

### **Waste Disposal**

One 240L Litter bin is located adjacent to the boat ramp. Additional bins are required in strategic locations, to deal with the issue of waste.

### **Signage**

Signage is very limited and of various age and condition - mainly Batemans Marine Park. Additional information and direction signage is required.

### **Other**

The existing boat ramp site is on BVSC managed Crown Land; as such a Crown Licence is required for the facility upgrade.

Wallaga Lake is part of the Batemans Marine Park; as such any works below the MHWL or impacting on the lake will require a Permit Application.

An Aboriginal Cultural Heritage Assessment Report carried out identified that Aboriginal objects are known to be present in certain areas; as such an Aboriginal Heritage Impact Permit (AHIP) is required.

### 3. NSW Boating Now Funding Approved Scope of Works

The proposed Beauty Point boat ramp project is one of three projects being delivered in the Far South Coast Region under Round 1 of the NSW Boating Now Program. The project is predominantly funded by RMS under the program, with a BVSC co-contribution bringing total project funding to \$410,000. This funding covers project management, design and construction of the following broad scope of works:

1. Replacement of the existing gravel boat ramp with a new reinforced concrete double boat ramp.
2. Enlargement and upgrade of the existing access road and launching area.
3. Enlargement and formalisation of the car /trailer parking.
4. Upgrade of lighting.

### 4. Existing Environment

#### General Description

The Beauty Point Boat Ramp site has been impacted by vehicle movement over approximately 60 years. While a sealed access road and boat launching area have been constructed, vehicle movement below the MHWL at the boat launching area has disturbed the original natural surface and contributed to the loss of seagrasses within the lake; this vehicular impact is also evident along the informal loop road following the shoreline and at the informal car/ trailer parking area at the top of the sealed access road.

#### Flora

Terrestrial: While the site has been historically modified to provide lake access and public parkland it is still dominated by a canopy of endemic eucalypt species including Bangalay (*Eucalyptus botryoides*), Red Bloodwood (*Corymbia gummifera*), Apple Gum (*Angophora floribunda*) and Yellow Stringybark (f. *muelleriana*). A single Kurrajong (*Brachychiton populneus*) also exists on the site. The mid storey has been extensively cleared in the proposed access road area to create a public park, however isolated stands dominated by Sweet Pittosporum (*Pittosporum undulatum*) exist around the bases of larger trees. Other mid and understorey species found in these small stands and along the less disturbed coastal fringe include Rough-fruited pittosporum (*Pittosporum revolutum*), Native Cherry (*Exocarpos cupressiformis*), Lightwood (*Acacia implexa*), Coffee bush (*Breynia oblongifolia*), Wombat Berry (*Eustrephus latifolius*) and Burrawang (*Macrozamia communis*). Ground cover is regularly mowed in the park area and includes native and exotic grasses, (however identification is difficult as no flowers/seed heads are present). The vegetation present on site is consistent with the following classifications:

NSW Vegetation Formation (Keith 2004)	KF_CHSB Dry Sclerophyll Forests (Shrubby sub-formation)
---------------------------------------	---



NSW Vegetation Class (Keith 2004)	South Coast Sands Dry Sclerophyll Forests
Plant Community Type (PCT)	Bangalay - Old-man Banksia open forest on coastal sands, Sydney Basin Bioregion and South East Corner Bioregion

This plant community type is listed under the NSW Biodiversity Conservation Act 2016 as Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions (Bangalay Sand Forest) Endangered Ecological Community (EEC). While impacts to this community will be minor (removal of up to six mature trees and removal of 0.05 ha of mid storey vegetation for the access road over a total of 0.26 ha) an assessment of significance has been completed (Appendix B). This assessment concludes that, with application of the proposed mitigation measures, the proposal will not have a significant impact on Bangalay Sand Forest EEC.

**Threatened Vegetation:** The site provides marginal habitat for several threatened flora species (refer to Appendix F) however their presence is considered unlikely and none were identified during a survey of the site.

**Weeds:** The site is relatively weed free considering the high levels of disturbance and the close proximity of residential properties. Weeds identified on site include exotic grasses (Kikuyu, Crowsfoot Grass), Cotoneaster (in low numbers) and a dense infestation of Cobblers Pegs (*Bidens pilosa*) along the existing access road to the boat ramp.

**Aquatic flora:** the area of existing boat launching use is largely free of any seagrass or important ecological communities. In the broader project footprint, there are several beds of seagrass, *Zostera meulleri*, which should not be impacted by the proposed works if the construction footprint is adhered to. Of lesser importance are some stands of *Codium fragile* (Green Sea Fingers or Dead Man's Fingers) and other unidentified benthic and epiphytic macroalgae, both growing on the existing jetty structure and underneath the jetty gangway.

## Fauna

The native canopy cover of the site provides habitat for a range of native fauna species. Data base searches (NSW BioNet, EPBC Protected Matters search) were undertaken to identify any threatened species likely to occur in the locality. A survey (including nocturnal survey) targeting these species and their habitat was undertaken on 12/3/2018 under favourable conditions. A review of likelihood of occurrence, presence of habitat and potential to be impacted by the proposal was completed following the survey (Appendix F). Hollow bearing trees occur in close proximity to the site however none will be impacted by the proposed works. One dead stag is proposed to be removed by the works. This stag is of a relatively young age and doesn't contain any obvious hollows, however a stag watch was undertaken as a precautionary measure - no fauna were detected using this tree. Fauna detected during a nocturnal survey of the site and adjacent forest include Sugar Glider, Boobook Owl, Common Brushtail Possum, Feathertail Glider, Common Ringtail Possum and several foraging microbats.

The site is exposed to a range of anthropomorphic disturbances due to the proximity to the Beauty Point residential area, public park, road and boat ramp. Fauna utilising the site are already exposed to this disturbance and the proposed works are unlikely to cause any significant additional disturbance. The removal of up to 6 trees will not result in significant habitat loss for any native species as none of the trees to be removed are hollow bearing and considering the large number of trees to be retained and located in the adjacent reserve.

Connectivity through the site will not be significantly reduced as the remaining trees will facilitate movement for any species that can currently move across the site.

## Geology

In the immediate footprint of the existing boat ramp and launching area geology comprises gravelly sands overlaying parent bedrock that is exposed as reefs (protruding into the lake in several places).

Published risk maps show the Beauty Point boat ramp site as having a low risk of potential acid sulphate soils.

## Heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) has been prepared for several BVSC sites including Beauty Point with the intention of gaining an Aboriginal Heritage Impact Permit (AHIP) to undertake these proposed works. Key findings of the report include:

- There are no overall heritage constraints regarding the proposed impacts;
- Aboriginal objects are known to be present in certain areas and an AHIP is required;
- The sites are generally highly disturbed because of extensive previous impacts;
- The cultural and archaeological significance of the sites has not been assessed to be of sufficient significance to warrant the implementation of avoidance or mitigation strategies; and
- No areas have been identified which warrant further archaeological investigation in order to formulate appropriate management and mitigation strategies.

There are no known non-Aboriginal heritage items that will be impacted by the proposed development.

## Socio-Economic

The facility is extensively used by locals and the area experiences a significant influx of visitors and tourists during holiday periods, with resultant high demand on existing boating infrastructure. This influx of tourists provides economic benefits to the community.

## 4. Legislation and Policy Requirements

### Legislative Requirements

Relevant provisions of the following legislation must be considered in relation to the proposed works.

- NSW Crown Lands Act, 1989
- State Environmental Planning Policy (Infrastructure) 2007
- Bega Valley Shire Council Local Environment Plan, 2013 (LEP)
- Biodiversity Conservation Act, 2016
- Environmental Planning & Assessment Act, 1979 (EP & A)
- The Local Government Act, 1993
- Protection of the Environment Operations Act, 1997
- National Parks & Wildlife Act, 1974 (NPW Act)
- Noxious Weeds Act, 1993
- Fisheries Management Act, 1994
- Roads Act NSW, 1993
- Environmental Protection and Biodiversity Conservation Act, 1999
- NSW Coastal Policy, 1997
- Heritage Act, 1977

### NSW Crown Land / NSW Land and Property Management Authority

The Beauty Point boat ramp site is located on a BVSC managed Crown reserve. The proposed upgrade works will be subject to a new licence application to Crown Lands.

### State Environment Planning Policy (Infrastructure) 2007

As the proposal involves a wharf or boating facility the development is permitted without consent under clause 68(5)(a) of the *State Environment Planning Policy (Infrastructure) 2007*.

### Bega Valley Local Environment Plan, 2013

The Beauty Point boat ramp is located within zone RE1 (Public Recreation) under the 2013 LEP. Boat launching ramps are permitted developments with consent within this zone. The adjoining land uses are Zone E2 (Environmental Conservation), Zone R2 (Low Density Residential) and Zone WI (Natural Waterways).

### Biodiversity Conservation Act 2016

The recently gazetted *Biodiversity Conservation Act 2016* has replaced two key pieces of biodiversity legislation, being the *Threatened Species Conservation Act 1995* and the *Native Vegetation Act 2003*.

The *Biodiversity Conservation Act 2016* establishes a modern and integrated legislative framework for land management and biodiversity conservation. Biodiversity elements include major innovations to offsetting and private land conservation, as well as improvements to threatened species conservation and how the community manages human-wildlife interactions.

### **Environmental Planning & Assessment Act, 1979 & EP&A Regulation 2000**

Council's obligation is to assess environmental impacts under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act, 1979). Consideration has been given to environmental impacts from the proposed activities, under section 111 and 112 of the EP&A Act 1979 and Clause 228 of the *Environmental Planning and Assessment Regulation 2000* which are addressed in the following sections.

### **Protection of the Environment Operations Act, 1997**

The *Protection of the Environment Operations Act 1997* (POEO Act) aims to protect, restore and enhance the quality of the environment in NSW having regard to the need to maintain ecological sustainable development and to reduce risk to human health and the degradation of the environment.

### **National Parks & Wildlife Act 1974 (NPW Act)**

All activities on reserve land must be consistent with the objects and purpose of the National Parks and Wildlife Act 1974 (NPW Act) and any adopted plan of management for the area. The site of works is not located within a National Park. This development is adjoining an Environmental Conservation Zone, therefore is sympathetic to the values of such areas.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and declared Aboriginal places by establishing offences of harm. Under the NPW Act, it is an offence to do any of the following things without an exemption or defence provided for under the NPW Act:

- A person must not knowingly harm or desecrate an Aboriginal object.
- A person must not harm or desecrate an Aboriginal object or Aboriginal place (strict liability).
- Harm includes destroy, deface or damage of Aboriginal object or Aboriginal Place, and in relation to an object, move the object from the land on which it has been situated.

This project is subject to an Aboriginal Heritage Impact Permit issued under Section 90A of the **NPW Act**.

### **Biosecurity Act 2015**

The aim of this Act is to reduce the negative impact of weeds on the economy, community and environment of this State by establishing control mechanisms.

Potential risks associated with this project together with mitigation measures are identified in Section 5 of this REF.

### **Fisheries Management Act 1994**

The objective of the Fisheries Management Act 1994 (FM Act) is to conserve fish stocks and key fish habitats, threatened species, population and ecological communities of fish and marine vegetation and biological diversity.

Under Part 7, Divisions 3, 4 and 8, a local government authority requires a fisheries permit to carry out dredging and reclamation works. An application for a Fisheries permit will be submitted during the planning phase of the project.

### **Roads Act NSW, 1993**

There will be improvements to the sealed access road and informal parking area delivered under this project. Civil design for these improvements will be carried out by BVSC. The extent of these works lies within the Council managed Crown reserve, with two connection points back in to Beauty Point Road, therefore no further consideration has been given to the Roads Act for the purpose of this REF.

### **Environmental Protection and Biodiversity Conservation Act 1999**

The objective of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as matters of national environmental significance. An EPBC Act Protected Matters search was undertaken for the site and threatened entities identified with a potential to occur on site have been included in the threatened species evaluation (Appendix F).

### **NSW Coastal Policy 1997**

The NSW Coastal Policy 1997 addresses four main principles of Ecological Sustainable Development; conservation of biological diversity and ecological integrity; intergenerational equity; improved valuation and incentive mechanisms; and the requirement of a risk adverse approach to decision making.

Council will implement mitigation measures and procedures to minimise the short term and long impacts to the coastal environment.

### **Heritage Act 1977**

Places, buildings, works, relics, moveable objects and precincts of State or local heritage significance are to be listed in the Heritage Schedule of the Bega Valley Local Environmental Plan 2013 or listed on the State Heritage Register.

No objects have been found on the above listed registers. Therefore, no further consideration has been given to the Heritage Act.

## 5. Environmental Assessment

Through a process of desktop analysis and site inspection an Environmental Impact Assessment (Appendix A) has been carried out for the proposed project. A consequence and likelihood risk matrix method has been utilised to determine the risk rating factor for this assessment.

This section focuses on those aspects that are identified as a potential risk during construction and addresses the issues with mitigation measures.

Soil
<b>Risk:</b> Eroded sediments may be transported and deposited on terrestrial vegetation or within aquatic habitats
<b>Risk Rating:</b> Low
<b>Mitigation Measures:</b>
Erosion and sediment control plan will be developed and implemented to manage run-off. Sediment and erosion control measures applied prior to commencement of work and during construction. Controls are to be installed and maintained in accordance with 'Blue Book'- Managing Urban Stormwater - Soils and Construction.
Disturbed areas are stabilised post construction, including removing control measures when they are no longer required.
Areas of bare soil and stockpiles managed to prevent erosion during construction in accordance with Landcom 'Blue Book' soils and construction. Suitable areas for stockpiling will be identified before commencement of works.

Work to be stopped if conditions are not suitable.

Traffic, Noise and Vibration
<b>Risk:</b> Amenity impacts - safety, minor noise and vibration pollution
<b>Risk Rating:</b> Low
<b>Mitigation Measures:</b>
Construction hours limited to those set out by Council and according to Interim Construction Noise Guideline.
Plant and equipment operators would be required to operate machinery in a manner that is proper and efficient and does not create excessive noise.

All plant and equipment maintained in a proper and efficient condition.



**Suitability of incoming organics and contamination****Risk:** Contamination of incoming construction material (imported fill)**Risk Rating:** Low**Mitigation Measures:**

Provision of certification clearance for imported material.

**Litter****Risk:** Windblown litter leaving the construction site**Risk Rating:** Low**Mitigation Measures:**

Regular inspection of the facility and surrounding areas to ensure construction site is litter free. Collection of windblown litter if required.

**Dust****Risk:** Airborne matter leaving the site during construction - impacts to local amenity and increasing stormwater sediment load**Risk Rating:** Low**Mitigation Measures**

Monitor dust generation on site.

Trucks are covered at all time when transporting materials that could generate dust.

Use dust management practices e.g. wetting unsealed roads.

**Flora and Fauna****Risk:**

1. Introducing or spreading weeds or pathogens
2. Impacting/endorsing threatened species
3. Damaging habitat adjacent to the development footprint

**Risk Rating:** Low**Mitigation Measures:**

Ensure a vehicle hygiene protocol is used to prevent introduction of weeds/pathogens

No work is to be undertaken outside the development footprint. Areas of native vegetation outside the footprint will be taped off to ensure no accidental damage.

Avoid pushing disturbed soil into adjacent areas of native vegetation.

Ensure road alignment will not require removal of hollow bearing trees outside the road

footprint for safety reasons.

Ensure operators protect root systems of retained trees.

#### Aboriginal Heritage - Due Diligence

**Risk:** Harm to Aboriginal objects or places

**Risk Rating:** Low

#### Mitigation Measures:

Work crews are inducted into the site informed of cultural heritage requirements and protocols.

If objects are found, which are thought to be of an Aboriginal site or cultural remains, the works are to stop immediately, the contractor is to contact BVSC project representative, who will contact the relevant NSW Office of Environment and Heritage (OEH) representative and provide details on the correct course of action.

In the unlikely event of skeletal remains being found during the activity, work must stop immediately, secure the area to prevent unauthorised access and contact the Project Representative who will contact NSW Police and OEH Representative.

#### Water

**Risk:** Pollution of waters

**Risk:** Low

#### Mitigation Measures:

Maintain diversion structures to prevent construction run-off from entering waterways.

Provide pollution control barriers (i.e. floating silt boom) during boat ramp construction.

Monitor water quality pre and post-construction.

## 6. Conclusion

The impact on the environment of the construction of the new boat ramp and associated civil infrastructure is assessed as low. This project is unlikely to result in significant adverse impacts on the environment in terms of a Part 5 'activity'.

It has been determined from this that an Environmental Impact Statement is not considered necessary and that the proposed works should apply the appropriate environmental mitigation measures during construction.

## APPENDIX A. Environmental Impact Assessment

For the purposes of Part V of the *Environment Planning and Assessment Act 1979*, the following assessment is made pursuant to Part 14, Division 1, Clause 228 of the *Environment Planning and Assessment Regulation 2000*.

### **{a) Any environmental impact on a community.**

There will be a short term impact (construction timeframe is anticipated to be 3-4 months) on the community during construction of the boat ramp and associated civil upgrades as the facilities will not be available for use by locals or visitors during this period. To minimise this impact the reconstruction is planned to occur throughout the winter months, which is a low activity period of use before the peak visitor/ tourist season arrives.

An alternative Wallaga Lake launch location is available at nearby Fairhaven Point.

The proposal will provide ongoing and long-term benefits to the community (locals and visitors alike) by replacing the current below standard facilities with a new boat ramp and improved access.

### **{b) Any transformation of a locality.**

The proposal involves the replacement of the below standard existing boat ramp with a new two lane boat ramp as well as improved access, parking, lighting and signage. The overall transformation of standard, functionality, condition, durability, aesthetics, safety, accessibility and usability will be considerable but will not transform the locality.

### **{c) Any environmental impact on the ecosystems of the locality.**

The impact of the proposal will be confined to the immediate vicinity of the boat ramp facility, and will have minimal impact on the ecosystems of the locality.

### **{d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.**

This proposal will result in an improvement, rather than a reduction, of the aesthetic, recreational, scientific or other environmental quality or value of a locality. Refer also to the response to (b) above.

**{e) 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.**

An Aboriginal Cultural Heritage Assessment Report (ACHAR) encompassing the extent of works at Beauty Point was completed, noting the following points:

- There are no overall heritage constraints regarding the proposed impacts;
- Aboriginal objects are known to be present in certain areas and an AHIP is required;
- The sites are generally highly disturbed because of extensive previous impacts;
- The cultural and archaeological significance of the sites has not been assessed to be of sufficient significance to warrant the implementation of avoidance or mitigation strategies; and
- No areas have been identified which warrant further archaeological investigation in order to formulate appropriate management and mitigation strategies.

**{f) Any impact on the habitat of protected fauna {within the meaning of the *National Parks and Wildlife Act 1974*).**

The proposed works will impact a maximum of 0.26 hectares of Bangalay Sand Forest EEC. This includes up to six mature canopy trees (no hollow bearing trees), .005 hectares of midstorey vegetation and 0.19 hectares of mown native and exotic grasses. Due to the small scale of impact, the high occurrence of the EEC in the locality and the already modified nature of the EEC on site the proposed works are not considered to have a significant impact to the habitat of protected fauna.

**{g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air.**

With respect to aquatic species, the area of existing boat launching use is largely free of any seagrass or important ecological communities. In the broader project footprint, there are several beds of *Zostera meulleri* which should not be impacted by the proposed works if possible. Of lesser importance are some stands of *Codium fragile* and other unidentified benthic and epiphytic macroalgae, both growing on the existing jetty structure and underneath the jetty gangway.

Database searches (NSW BioNet and EPBC Protected Matters search tool) and onground surveys have been undertaken to determine the potential for the proposal to impact terrestrial threatened species and communities. The proposal is considered unlikely to significantly impact any threatened species or threatened ecological community (refer to Appendix B and Appendix F).

Published risk maps show Beauty Point as having a low risk of potential acid sulphate soils.

**{h) Any long-term effects on the environment.**

The proposal will result in beneficial effects on the environment in the long-term by replacing a below standard facility with a new facility of significantly better standard, functionality, condition, durability, aesthetics, safety, accessibility and usability.

**{i) Any degradation of the quality of the environment.**

Short-term - refer to the response to (g) above.

Long-term - refer to the response to (h) above.

**{j) Any risk to the safety of the environment.**

The proposal will result in enhanced site safety through expansion and formalisation of the existing access road and informal car/ trailer parking area.

**{k) Any reduction in the range of beneficial uses of the environmental.**

The proposal will significantly improve the existing facility and therefore increase the range of beneficial uses of the environment. Refer also to the response to (b) above.

**{l) Any pollution of the environment.**

The proposal only presents a pollution risk during construction. This risk will be minimised by BVSC normal practices in contractor selection including consideration of their environmental record and management of the contractor based on their project specific documentation such as Erosion and Sediment Control Plan (ESCP) or an Environmental Management Plan (EMP).

**{m) Any environmental problems associated with the disposal of waste.**

Waste disposal will be detailed in the appointed contractor's EMP; essentially all construction, general and recyclable waste will be removed from the site and disposed of at BVSC facilities.

**{n) Any increased demand on resources {natural or otherwise) that are, or are likely to become, in short supply.**



The design does not include any items, materials or components that require resources (natural or otherwise) that are, or are likely to become, in short supply.

**{o) Any cumulative environmental effect with other existing or likely future activities.**

There are no existing or known likely future activities that will cumulatively impact the environment.

**{p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions.**

The location of the boat ramp facility at Beauty Point is subject to tidal processes, coastal inundation and riverine flooding. The design and construction of the boat ramp and carpark are such that they will withstand the impacts of coastal processes or irregular coastal hazards.

## APPENDIX B. Assessment of Significance (Five Part Test) for Threatened Species or Endangered Ecological Communities

Part 7.3 NSW *Biodiversity Conservation Act 2016 (BC Act)* requires that an assessment of significance be undertaken to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

The following assessment of significance has been undertaken for possible impacts to Bangalay sand forest, Sydney Basin and South East Corner bioregions (Bangalay sand forest) Endangered Ecological Community (EEC) as part of the proposed Beauty Point boat ramp upgrade. While the floristics of the vegetation community on site are consistent with Bangalay sand forest, the substrate it is growing on is not sandy. It could be argued that the site therefore cannot be considered to support Bangalay sand forest as the substrate is a defining attribute of this community. However, this five part test has been completed as a precautionary measure.

Bangalay sand forest occurs on deep, freely draining to damp sandy soils on flat to moderate slopes within a few kilometres of the sea and at altitudes below 100 m. Bangalay Sand Forest has a dense to open tree canopy, approximately 5 - 20 m tall, depending on exposure and disturbance history, an understorey of mesophyllous or sclerophyllous small trees and shrubs, and a variable groundcover dominated by sedges, grasses or ferns. The most common tree species include *Eucalyptus botryoides* (Bangalay) and *Banksia integrifolia* subsp. *integrifolia* (Coast Banksia), while *Eucalyptus pilularis* (Blackbutt) and *Acmena smithii* (Lilly Pilly) may occur in more sheltered situations

**{a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:**

N/A

**{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.*

The proposed works will have a minimal direct impact on Bangalay sand forest. The relatively small footprint and already modified nature of the EEC means that the proposed works are highly unlikely to place the local occurrence of the EEC at risk of extinction. Conservatively there are 30 hectares of this community within 1km of the site, which is a significant proportion of the total vegetation as most of the area within 1km is water (Wallaga Lake).

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

The proposed works will impact a maximum of 0.26 hectares of Bangalay Sand Forest EEC. This includes up to six mature canopy trees (no hollow bearing trees), .005 hectares of midstorey vegetation and 0.19 hectares of mown native and exotic grasses. Due to the small scale of impact, the high occurrence of the EEC in the locality and the already modified nature of the

EEC on site the proposed works are unlikely 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.

**{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.*

As described above a maximum of 0.26 ha of Bangalay sand forest could be directly impacted in. A conservative estimate of the occurrence of this EEC within 1km of the site is 30 ha.

*(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.*

No EEC habitat will become fragmented by the works. The site is already modified with high public use and cleared native mid and understorey, the proposed works will not further compromise connectivity.

*(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.*

Due to the small scale of impact and the occurrence of the EEC in the surrounding locality, the area impacted is not considered significant to the long term survival of the EEC in the locality.

**{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 value have been declared in the Bega Valley Shire.

**{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:**

Clearing of native vegetation and Invasion of native plant communities by exotic perennial grasses are relevant Key Threatening Processes that impact Bangalay sand Forest. The proposed works are unlikely to increase the impact of these Key Threatening Processes due to the mitigation measures described above (e.g. vehicle hygiene protocol) and the small scale of the works in an already disturbed patch.

## **APPENDIX C. Maritime Design Documentation**

## GENERAL NOTES

- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL CONTRACT DOCUMENTS, & THE REQUIREMENTS OF THE RELEVANT BUILDING AUTHORITIES. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- CONSTRUCTION FROM THESE DRAWINGS, AND THEIR ASSOCIATED CONSULTANTS' DRAWINGS, IS NOT TO COMMENCE UNTIL APPROVED BY THE LOCAL AUTHORITIES.
- THIS PERFORMANCE SPECIFICATION DETAILS THE MINIMUM WORKMANSHIP STANDARDS & MATERIALS REQUIRED TO COMPLETE THE WORKS. IT IS NOT NECESSARILY PRESCRIPTIVE OF ALL ITEMS REQUIRED. THE CONTRACTOR SHALL COMPLY TO BEST INDUSTRY STANDARDS AS WELL AS ALL RELEVANT AUSTRALIAN STANDARDS.
- ALL DIMENSIONS ARE IN MILLIMETRES (MM). ALL LEVELS ARE IN METRES (M) TO 0.0 C.D (CHART DATUM) APPROX -0.925M AUSTRALIAN HEIGHT DATUM (AHD).
- DO NOT OBTAIN DIMENSIONS BY SCALING FROM THESE DRAWINGS. ALL DIMENSIONS & MEASUREMENTS MUST BE VERIFIED ON SITE BY THE CONTRACTOR PRIOR TO COMMENCING WORK.
- ANY DISCREPANCY BETWEEN THESE DRAWINGS AND ACTUAL CONDITIONS ON SITE SHALL BE REFERRED TO THE ENGINEER & WRITTEN INSTRUCTION OBTAINED BEFORE PROCEEDING WITH THE WORK.
- ALL ABBREVIATIONS ARE IN ACCORDANCE WITH AS 1100.
- THE CONTRACTOR MUST FULLY FAMILIARIZE THEMSELVES WITH

- THE SITE AND THE SITE CONDITIONS, AND SHALL ALLOW FOR ALL CONSTRAINTS, TEMPORARY WORKS OR OTHER MEASURES REQUIRED ENABLING THE WORKS TO PROCEED SMOOTHLY.
- AN INDUSTRY PRODUCT SPECIFIED MAY ONLY BE SUBSTITUTED WITH AN EQUIVALENT PRODUCT IF FIRST APPROVED BY PRINCIPAL.
- THE CONTRACTOR SHALL KEEP DETAILED RECORDS & RECEIPTS OF ALL ASPECTS AND STAGES OF WORK AND MATERIALS USED & SUBMIT TO PRINCIPAL AS REQUESTED.
- THE CONTRACTOR SHALL PROTECT ALL WORKERS AGAINST OHS RISK.
- DURING CONSTRUCTION THE CONTRACTOR SHALL MAINTAIN THE STRUCTURE AND ANY ASSOCIATED EXCAVATIONS IN A STABLE & SAFE CONDITION & NO PART SHALL BE OVERSTRESSED.
- ALL WORK SHALL BE DONE IN SUCH A WAY THAT ADEQUATELY PREVENTS MATERIAL OR POLLUTANTS FROM ENTERING HARBOR. PROVIDE PROPRIETARY SILT CURTAIN AROUND ALL EXCAVATION.
- REMOVE ALL CONSTRUCTION DEBRIS FROM SITE.

## STANDARDS

- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THIS SPECIFICATION AND THE RELEVANT CURRENT STANDARDS AUSTRALIA CODES, AND THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES INCLUDING:
  - THE NSW MARITIME AUTHORITY ENGINEERING STANDARDS & GUIDELINES FOR MARITIME STRUCTURES
  - PWD DESIGN GUIDELINES FOR WHARVES & JETTIES - 1990
  - PWD BOAT LAUNCHING RAMPS GUIDELINES - 1985
  - AS 1170 LOADING CODE
  - AS 3962 DESIGN OF MARINAS
  - AS 4997 GUIDELINES FOR DESIGN MARITIME STRUCTURES
  - AS 1720 TIMBER STRUCTURES
  - AS 4100 STEEL STRUCTURES
  - AS 3600 CONCRETE STRUCTURES
  - AS 1664 /1665 ALUMINIUM STRUCTURES
  - AS 2312 PROTECTION OF STEEL AGAINST CORROSION

## DESIGN PARAMETERS

- VEHICLE LOAD  
BOATRAMP = 10 KPA OR 9 KN PT LOAD  
3T CAR PLUS 2T VESSEL
- DESIGN WIND BASIC WIND VELOCITY  
REGION A, CATEGORY 2, R=50  
VR(50) = 41 M/S ULTIMATE, VDES = 37 M/S,  
QZ = 0.57 KPA
- THE MAXIMUM DESIGN WAVE FOR THIS SITE IS  
H 0.2M T 2.0S
- DESIGN WAVE LOAD ON FIXED STRUCTURES IS  
FWAVE = 2.0 KN/M  
(FACTORED FROM 2 KN/M FOR A 0.6M WAVE AS 3962.)

- DESIGN CURRENT AT SITE IS MAX  
VC = 2 KNOTS
- DESIGN VESSEL FOR USE ON BOATRAMP  
RUNABOUT 8.0 m x 2.4m x 0.5m @ 2 T

## SURVEY DATA

- THE DIGITAL DATA FOR THE FORESHORE LINES, PROPERTY BOUNDARIES & DIVISION OF WATERWAYS LINES AND HYDROGRAPHIC DATA SHOWN ON THESE DRAWINGS HAVE BEEN PROVIDED BY BEGA VALLEY SHIRE COUNCIL SURVEY.
- THE CONTRACTOR SHALL CHECK FOR DISCREPANCIES AS APPROPRIATE.

## GEOTECHNICAL INFORMATION

- THE GEOTECHNICAL INFORMATION AVAILABLE AT THE TIME OF DESIGN WAS LIMITED.
- ASSUMED CONDITIONS ARE BASED ON LIMITED PROBING AND RECORDATION.
- THE CONTRACTOR FOR SHALL MAKE THEIR OWN ASSESSMENT OF THE GEOTECHNICAL CONDITIONS TO ENSURE THAT THE DESIGN LOADS ARE ACHIEVED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSESSING THE INFORMATION PROVIDED AND CONDUCTING ANY FURTHER INVESTIGATIONS HE MAY DEEM NECESSARY TO ENSURE PROPER FOUNDING OF THE WORKS.
- THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IF GROUND CONDITIONS VARY FROM THOSE SHOWN ON THE DRAWINGS

## TEMPORARY WORKS

- TEMPORARY PROPPING OF THE EXISTING STRUCTURE SHALL BE TO THE CONTRACTOR'S DETAILS AND DESIGN. ALL TEMPORARY WORKS, INCLUDING ASSESSMENT OF EXISTING STRUCTURE TO SUPPORT TEMPORARY PROPPING AND /OR DEMOLITION ACTIVITIES AND EQUIPMENT, ARE THE RESPONSIBILITY OF THE CONTRACTOR.

## DEMOLITION

- THE CONTRACTOR SHALL CARRY OUT ALL DEMOLITION ACTIVITIES, INCLUDING, BUT NOT LIMITED TO, THE PROTECTION OF THE PUBLIC, THE PROTECTION OF THE ADJOINING PREMISES AND TENANCIES, AND DEMOLITION METHODS, IN STRICT ACCORDANCE WITH THE AUSTRALIAN STANDARD AS 2601 - THE DEMOLITION OF STRUCTURES, AND ALL RELEVANT WORKCOVER GUIDELINES, CODES OF PRACTICE AND REQUIREMENTS AND ALL RELEVANT STATE AND LOCAL AUTHORITIES REGULATIONS, SPECIFICATIONS AND DOCUMENTS.
- DISPOSE OF DEMOLISHED MATERIAL APPROPRIATELY.
- ALL COMPONENTS SPECIFIED FOR REUSE SHALL BE CAREFULLY REMOVED & STORED BY THE CONTRACTOR AND REMAIN THE PROPERTY OF THE PRINCIPAL AT ALL TIMES.
- ALL DEMOLISHED STRUCTURES SHALL BE FULLY REMOVED FROM THE SEABED AND FROM THE SITE INCLUDING PILE STUMPS.

## MONITORING DURING EXCAVATION

- THE BUILDER SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ANY EXCAVATIONS IN A STABLE CONDITION WITHOUT ADVERSELY AFFECTING SURROUNDING PROPERTIES INCLUDING STRUCTURES AND SERVICES. THIS INCLUDES OBTAINING ALL NECESSARY APPROVALS FOR SHORING AND ANCHORING SYSTEMS.
- THE CONTRACTOR SHALL CARRY OUT AN APPROPRIATE DETAILED DILAPIDATION SURVEY OF SURROUNDING BUILDINGS PRIOR TO ANY SITE WORKS COMMENCING.
- THE CONTRACTOR SHALL KEEP DETAILED PHOTOGRAPHIC RECORD OF ALL STAGES OF WORKS & SUBMIT TO PRINCIPAL.
- A SURVEY AFTER EXCAVATION IS COMPLETED SHALL BE COMPLETED.
- CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY AND MAKE GOOD ANY DAMAGE CAUSED DURING EXCAVATION WORKS.

## EXIST STRUCTURE & SERVICES

- THE CONTRACTOR SHALL MAKE GOOD ANY DAMAGE TO EXISTING PROPERTY & SERVICES RESULTING FROM EXCAVATION WORKS.
- CONTRACTOR MUST ESTABLISH LOCATION AND EXTENT OF ALL EXISTING SERVICES INCLUDING UNDERGROUND SERVICES AND SUBMARINE CABLES AND THE LIKE PRIOR TO COMMENCEMENT ON SITE.
- PRIOR TO RELYING ON ANY EXISTING STRUCTURES, THE CONTRACTOR SHALL CONFIRM THAT THE EXISTING STRUCTURE IS IN GOOD CONDITION, AND CAN SUPPORT THE REQUIRED LOADS.
- SHOULD THE EXISTING STRUCTURE REQUIRE STRENGTHENING THEN A QUALIFIED STRUCTURAL ENGINEER SHALL BE ENGAGED TO PROVIDE WRITTEN INSTRUCTIONS ON REPAIRS.

## FOUNDATIONS

- FOUNDATIONS ARE DESIGNED FOR THE FOLLOWING ALLOWABLE PRESSURES:

ELEMENT	BEARING PRESSURE	SHAFT ADHESION	LATERAL CAPACITY
SLAB ON GROUND	100 KPA	N/A	NA
FOOTINGS ON SAND	100 KPA	NA	NA
FOOTINGS ON CLAY	150 KPA	NA	NA
FOOTINGS ON SHALE	400 KPA	NA	NA
FOOTINGS ON SANDSTONE PILES ON WEAK ROCK	650 KPA	NA	NA
- CLASS 3 SANDSTONE - 3500 KPA  
CLASS 3 SANDSTONE IS DESCRIBED AS MEDIUM STRONG AND SANDSTONE CORES CAN BE BROKEN BY HAND & EASILY SCORABLE BY KNIFE  
SOUND ROCK TO BE FREE OF DEFECTS OR SEAMS IN THE TOP 600MM AND WITH AGGREGATE THICKNESS OF SEAMS BELOW THIS OF LESS THAN 50MM
- SAND MUST BE MEDIUM DENSE SAND WITH THE FOLLOWING MINIMUM DESIGN CHARACTERISTICS:  
INTERNAL FRICTION ANGLE - 30 DEG  
DRY DENSITY - 18 KN/M3  
ELASTIC MODULOUS ES - 75 MPA
- COHESIVE MATERIAL MUST BE STIFF TO FIRM WITH THE FOLLOWING MINIMUM DESIGN CHARACTERISTICS:  
UNDRAINED SHEAR STRENGTH CU > 35 KPA  
ELASTIC MODULOUS ES > 6MPa

- THE CONTRACTOR MUST PROVIDE SUFFICIENT RECORDS AND TO CERTIFY THAT THE FOUNDATION REQUIREMENTS HAVE BEEN ACHIEVED.

## FOOTINGS

- FOOTINGS MUST BEAR 250 MM MINIMUM IN NATURAL GROUND
- OBTAIN THE APPROVAL OF THE ENGINEER FOR ALL EXCAVATIONS AND FOOTINGS PRIOR TO CONCRETING WHERE FOOTINGS ARE OVER-EXCAVATED, FILL OVER-EXCAVATED AREAS WITH BLINDING CONCRETE GRADE 1 SAME AS FOOTING TO A MINIMUM THICKNESS OF 50MM.
- KEEP FOOTINGS CLEAN AND FREE OF LOOSE MATERIAL BEFORE INSPECTION, IMMEDIATELY PRIOR TO POURING OF CONCRETE AND DURING POURING.
- FOOTINGS ARE TO BE CONSTRUCTED AND BACKFILLED AS SOON AS POSSIBLE FOLLOWING EXCAVATION TO AVOID SOFTENING OR DRYING OUT BY EXPOSURE.
- SHOULD THE FOUNDATION CONDITION PROVE TO BE PART ROCK AND PART SOIL (SUCH AS FLOATERS AND THE LIKE) THE CONTRACTOR SHALL OBTAIN STRUCTURAL DETAILS AND APPROVAL IN WRITING FROM THE ENGINEER PRIOR TO CONTINUING.
- FILLING SHALL BE GRANULAR MATERIAL COMPACTED IN NOT MORE THAN 200 MM LAYERS TO A MINIMUM DRY DENSITY RATIO (AS 1289/E4.2 1982)

## BULK EARTHWORKS

- ALL EXCAVATION WORK TO BE CARRIED OUT TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT INCLUDING INSPECTION OF STRIPPING, APPROVAL OF FILL MATERIAL AND APPROVAL OF COMPACTION.
- CONTRACTOR SHALL MAKE OWN ASSESSMENT FOR EXCAVATION CONDITIONS, INCLUDING NATURAL WATER LEVELS AND GROUND CONDITIONS.
- REFER TO SURVEY DRAWINGS FOR EXISTING SERVICES AND LEVELS.
- V.R.C. INDICATES VERTICAL ROCK CUT, ROCK TO BE CUT NEAR UNLESS NOTED OTHERWISE
- OVERBURDEN OCCURRING ABOVE ROCK SHALL BE BATTERED BACK AT 2:1 AS REQUIRED.
- SITE SURFACE CONTOURS SHOWN ARE INDICATIVE ONLY. FOR TRUE SURFACE LEVELS REFER SURVEY DRAWINGS.

## GEOTEXTILES

- NEW SEAWALLS TO HAVE GEOFABRIC BEHIND WALL
- GEOTEXTILES SHALL BE CAL SHIPCO SUEALASIA PTY LTD BIDIM RANGE A44 NON-WOVEN GEOTEXTILE OR EQUIVALENT.
- PROTECT GEOFABRIC FROM EXPOSURE TO DIRECT SOLAR RADIATION BEFORE PLACING OF SHARP PROJECTIONS & ROCKS

## ROCK FILL

- ROCK FILL SHALL BE IGNEOUS BASALT HARD ROCK ANGULAR AND ROUGH BROKEN. PROVIDE A SAMPLE TO SUPERINTENDANT FOR APPROVAL PRIOR TO ORDER.
- MPA MINIMUM SATURATED COMPRESSIVE STRENGTH
- PLACE ROCKS IN SUCH A MANNER AS TO AVOID SMOOTH PLACEMENT
- ALL FILL SHALL BE WASHED WHERE IT IS TO BE PLACED IN THE WATER COLUMN TO ENSURE THAT MINIMUM SILT ENTERS THE WATER.

## GEOGRID

- GEOGRID SHALL BE TENSAR TRIAX GEOGRID TXL - LARGE APERTURE GRID BY TENSAR PTY LTD

## EARTHWORKS FOR SEAWALLS

- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH AS4678 EARTH RETAINING STRUCTURES AND TO BEST INDUSTRY PRACTICE FOR SEAWALL CONSTRUCTION.
- THE CONTRACTOR IS TO UNDERTAKE ALL EXCAVATION NECESSARY AND ALL EARTHWORKS TO COMPLETE REPAIR WORKS COMPLETE THE WORKS
- SOIL TO BE COMPACTED TO AS2870 REQUIREMENTS & TESTED BY A NATA APPROVED LAB IF REQUESTED BY ENGINEER
- EXCAVATION AND CONSTRUCTION MAY HAVE TO BE UNDERTAKEN IN SECTIONS TO ENSURE STABILITY.
- PROVIDE A TEMPORARY COFFERDAM OR SILT CURTAIN TO ALL WORKS TO PREVENT MATERIAL FROM ENTERING THE HARBOR & TO PROTECT THE WORKS DURING CONSTRUCTION
- THE CONTRACTOR SHALL PROVIDE ALL GEOTECHNICAL SERVICES REQUIRED TO COMPLETE THE WORKS.
- THE CONTRACTOR SHALL PROVIDE ALL ADDITIONAL FILL REQUIRED.
- THE CONTRACTOR SHALL REINSTATE THE SOIL TO CORRECT DEPTH SHOWN ON THE PLANS.

## SEAWALLS

- EXISTING SEAWALLS TO REMAIN & MAKE GOOD
- ENSURE STABILITY AND INTEGRITY OF SEAWALLS IS MAINTAINED AT ALL TIMES.
- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH AS4678 EARTH RETAINING STRUCTURES AND TO BEST INDUSTRY PRACTICE FOR SEAWALL CONSTRUCTION.
- THE CONTRACTOR IS TO UNDERTAKE ALL EXCAVATION NECESSARY AND ALL EARTHWORKS TO COMPLETE REPAIR WORKS COMPLETE THE WORKS
- SOIL TO BE COMPACTED TO AS2870 REQUIREMENTS & TESTED BY A NATA APPROVED LAB IF REQUESTED BY ENGINEER
- EXCAVATION AND CONSTRUCTION MAY HAVE TO BE UNDERTAKEN IN SECTIONS TO ENSURE STABILITY.
- PROVIDE A TEMPORARY COFFERDAM OR SILT CURTAIN TO ALL WORKS TO PREVENT MATERIAL FROM ENTERING THE HARBOR & TO PROTECT THE WORKS DURING CONSTRUCTION
- THE CONTRACTOR SHALL PROVIDE ALL GEOTECHNICAL SERVICES REQUIRED TO COMPLETE THE WORKS.
- THE CONTRACTOR SHALL PROVIDE ALL ADDITIONAL FILL AND ROCKS AS REQUIRED.
- THE CONTRACTOR SHALL REINSTATE THE SOIL TO CORRECT DEPTH SHOWN ON THE PLANS.

## BACKFILL FOR SEAWALLS

- GRANULAR BACKFILL BEHIND WALLS TO BE SELECTED FREE DRAINING GRANULAR FILL WITH FOLLOWING MINIMUM REQUIREMENTS:  
MAXIMUM PARTICLE SIZE = 75 MM,  
PROPORTION PASSING THROUGH A 0.60MM SEIVE = ZERO  
COMPACTED DENSITY INDEX OF 75% TO AS 1289.5.6.1 IN 150MM LAYERS MAXIMUM.
- EXISTING FILL MAY BE RE-USED BEHIND THE NEW WALL PROVIDING THAT IT MEETS WITH THESE REQUIREMENTS.
- ALL NEW WORKS TO HAVE GEOFABRIC PLACED BEHIND WALL

## DREDGING

- APPROPRIATE POLLUTION CONTROL MEASURES SHALL BE INSTALLED AS REQUIRED TO SATISFY THE POLLUTION CONTROL AUTHORITY
- DREDGED MATERIAL TO BE REMOVED FROM SITE & DISPOSED IN AN APPROVED MANNER ON LANDS
- SHOWN ON THE PLAN TO GIVE AN EVEN SURFACE FREE FROM POTHOLES OR ROCKS PROJECTING ABOVE THE DESIGN SURFACE LEVEL.
- DREDGED MATERIAL TO BE REMOVED FROM SITE & DISPOSED IN AN APPROVED MANNER ON LANDS
- SUFFICIENT TO PROVE THE DREDGING HAS MET TARGET LEVELS.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY LICENCES AND PERMITS FOR WORK.

## FORMWORK

- THE DESIGN, CERTIFICATION CONSTRUCTION & PERFORMANCE OF FORMWORK, FALSEWORK & PROPPING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- FORMWORK DESIGN, CONSTRUCTION, TOLERANCES & STRIPPING SHALL COMPLY WITH AS1509 AUSTRALIAN FORMWORK CODE; AS 3600 & AS 3610 UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- ALL ERECTION AND DISMANTLING OF FORMWORK TO BE CARRIED OUT IN A SAFE AND TRADESMAN LIKE MANNER AND TO LOCAL AUTHORITY REQUIREMENTS AND OHS REGULATIONS.
- CONTRACTOR SHALL ENSURE THAT THE SUPPORTING GROUND OR SLAB HAS ADEQUATE CAPACITY TO SUPPORT THE IMPOSED LOADS.
- DURING CONSTRUCTION SUPPORT PROPPING WILL BE REQUIRED WHERE LOADS FROM STACKED MATERIALS, FORMWORK AND OTHER SUPPORTED SLABS INDUCE LOADS IN A SLAB OR BEAM WHICH EXCEED THE DESIGN LOAD FOR STRENGTH OR SERVICEABILITY AT THAT AGE. ONCE THE NOMINATED 28 DAY STRENGTH HAS BEEN ATTAINED, THESE LOADS SHALL NOT EXCEED THE DESIGN SUPERIMPOSED LOADS.
- CONSTRUCTION SUPPORT PROPPING IS TO BE LEFT IN PLACE WHERE NEEDED TO AVOID OVERSTRESSING THE STRUCTURE DUE TO CONSTRUCTION LOADING.
- MAINTAIN THE STABILITY OF ALL FORMWORK AT ALL TIME. THE FORMWORK AND FALSEWORK SHALL BE MONITORED BEFORE CONCRETE POURING AND IF NECESSARY ADJUSTED TO MAINTAIN STABILITY.
- NO WORK IS TO BE CONSTRUCTED ON SUSPENDED LEVELS UNTIL ALL PROPPING IS REMOVED AND THE SLAB HAS ABSORBED ITS DEAD LOAD DEFLECTION.
- THE FORMWORK SHALL NOT BE DESIGNED TO RELY ON ANY RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE WITHOUT PRIOR APPROVAL BY ENGINEER
- CLEAN FORMWORK THOROUGHLY OF ALL DEBRIS INCLUDING STEEL TIE SNIPS PRIOR TO CASTING CONCRETE
- PROVIDE UPWARD CAMBER TO FORMWORK OF REINFORCED CONCRETE CANTILEVERS OF L/120, WHERE L IS THE PROJECTION BEYOND COLUMN OR WALL FACE, AND TO FORMWORK OF SLABS WHERE NOTED ON PLAN. MAINTAIN THE SLAB AND BEAM DEPTHS SHOWN.
- CONCRETE FORMED SURFACES TO HAVE CLASS 2 FINISH TO AS3610 UNLESS ARCHITECTS SPECIFY OTHER
- ALL PATHWAYS TO BE COARSE BROOM FINISHED IN TRANSVERSE DIRECTION

## CONCRETE

- ALL MATERIALS & WORKMANSHIP SHALL BE IN ACCORDANCE WITH AS3600 AND AS3610 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS
- PREMIXED OR READY MIX CONCRETE SUPPLY SHALL BE IN ACCORDANCE WITH AS1379. PORTLAND CEMENT SHALL BE TYPE SL AND SHALL BE OBTAINED FROM AN APPROVED SOURCE
- ALL THE REQUIREMENTS OF THE ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO FORMWORK, REINFORCEMENT AND CONCRETE.
- PROJECT CONTROL TESTING SHALL BE CARRIED OUT TO AS3600 AND AS1379 CLAUSE 87
- CONCRETE MIX DESIGNS TO BE SUBMITTED FOR REVIEW PRIOR TO USE.
- MARINE CEMENT SHALL BE A BLENDED CEMENT SUITABLE FOR MARINE USE CONFORMING TO AUSTRALIAN STANDARDS SUPER PLASTISER MAY BE USED TO REDUCE THE WATER CONTENT WHILE MAINTAINING ADEQUATE WORKABILITY.
- WHERE APPROVED SHRINKAGE REDUCING ADMIXTURES IF USED SUCH AS ECOLIFE OR APPROVED EQUIVALENT IF SPECIFIED, MUST BE ADDED TO MIX PRIOR TO POUR.
- NO ADMIXTURES OR ASH CONTENT SHALL BE USED UNLESS APPROVED BY ENGINEER IN WRITING.
- FOR THESE CONCRETE MIXES THE REQUIREMENTS SPECIFIED FOR STRENGTH AND SHRINKAGE ARE MANDATORY, OTHER PARAMETERS FOR THESE MIXES HAVE BEEN SUGGESTED BUT MAY BE VARIED.
- WHERE POSSIBLE ALL CONCRETE IS TO BE PLACED IN THE DRY. WHERE NECESSARY, CONCRETE PLACED UNDER WATER TO BE POURED USING A TREMIE.
- ALL CONCRETE INCLUDING SLABS ON GROUND AND FOOTINGS SHALL BE COMPACTED USING MECHANICAL VIBRATORS.
- FINISHED CONCRETE SHALL BE A DENSE HOMOGENOUS MASS, COMPLETELY FILLING THE FORMWORK & THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS
- CURING OF CONCRETE IS TO BE ACHIEVED BY KEEPING SURFACES CONTINUOUSLY WET FOR A PERIOD OF 3 DAYS AND BY PREVENTING MOISTURE LOSS FOR A TOTAL OF 7 DAYS FOLLOWED BY A GRADUAL DRYING OUT.
- APPROVED SPRAYED ON CURING COMPOUNDS THAT COMPLY WITH AS 3799 MAY BE USED WHERE FLOOR FINISHES WILL NOT BE AFFECTED (REFER MANUFACTURER'S SPECIFICATION).
- POLYTHENE SHEETING OR WET HESSIAN MAY BE USED TO RETAIN CONCRETE MOISTURE WHERE PROTECTED FROM WIND AND TRAFFIC.
- CONCRETE SIZES SHOWN DO NOT INCLUDE THICKNESS OF APPLIED FINISHES
- DEPTH'S OF BEAMS ARE GIVEN FIRST AND INCLUDE SLAB.60 SOFT AREAS ARE TO BE REMOVED & REPLACED WITH A SUITABLE COMPACTED FILL.
- PROOF ROLL NATURAL GROUT & THOROUGHLY COMPACT SUB-GRADE MATERIAL USING MULTIPLE PASSES OF A HEAVY ROLLER TO ACHIEVE A UNIFORM MINIMUM OF 98% STANDARD DENSITY AS DETERMINED BY THE LABORATORY PROCEDURE 1289 E1.1 AS DESCRIBED IN AS1289. METHODS OF TESTING SOILS FOR ENGINEERING PURPOSES
- PLACE FILL IN MAXIMUM 150MM THICK LAYERS TO A MAXIMUM DEPTH OF 750MM UNO IN ACCORDANCE WITH THE FOLLOWING:

-	3	8
-	LOW FINES CONTENT	
-	PROPORTION PASSING 0.075MM SIEVE 25% MAX	
-	PLASTICITY INDEX >2%, <15%	
-	COMPACTION TO 95% STANDARD COMPACTION IN ACCORDANCE WITH AS1289-E1.1 FOR COHESIVE SOILS AND 75% DENSITY INDEX FOR GRANULAR SOILS.	
- INSTALL 50MM SAND BLINDING IF REQUIRED TO SMOOTH SURFACE.
- PLACE 0.2MM POLYTHENE MEMBRANE
- PROVIDE N12 TRIMMER 1500 L TO UNDERSIDE MESH TO ALL REINFORCING JOINTS
- PROVIDE 10MM JOINTS OR APPROVED EQUIVALENT BETWEEN ALL WALLS, COLUMNS AND SLAB TYPICAL.
- CURE CONCRETE USING WET HESSIAN FOR 7 DAYS.
- INSTALL SAWN OR TOOLED JOINTS IN ACCORDANCE WITH THE DRAWINGS
- PROVIDE ALL GRADES TO ADEQUATELY DRAIN WATER TO PITS. REFER TO ARCHITECTS AND HYDRAULIC ENGINEERS DRAWINGS FOR LOCATION OF ALL GRADES, PITS, DRAINS, KERBS, AND SERVICES INFORMATION

## STEEL REINFORCEMENT

- ALL REINFORCEMENT SHALL BE TO AS4671 - 2001
- ALL REINFORCEMENT SHALL BE STRENGTH GRADE 500N UNO
- ALL CAST IN SITU REINFORCEMENT SHALL BE GALVANISED TO 600 GM/2 TO AS4680.
- THE GALVANISING OF REINFORCING SHALL BE UNDERTAKEN AFTER ALL CUTTING, BENDING AND WELDING OF CAGES IS COMPLETE. REPAIR ANY DAMAGE TO GALVANISING OR CUTS FOLLOWING THE PROCEEDURES IN AS4680. DO NOT ACTIVATE ADJACENT STEELWORK BY CONTACT WITH THE GALVANISED REINFORCEMENT.
- SYMBOLS AS PER AS4671  
R - ROUND BAR GRADE 250 TO AS3679.1  
D500L - DEFORMED BAR LOW DUCTILITY  
D500N - DEFORMED BAR NORMAL DUCTILITY GRADE 500  
SL - SQUARE MESH GRADE 500
- REINFORCEMENT IS REPRESENTED DIAGRAMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION
- ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS.
- IN EXPOSURE CONDITIONS GREATER THAN B1 USE ONLY PLASTIC CHAIRS.
- SUPPORT BARS AT MAX 1000MM CENTRES BOTH WAYS.
- FABRIC SHALL BE SUPPORTED AT NOT GREATER THAN 800MM CTS. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.
- LAPS AND SPLICES IN REINFORCEMENT SHALL BE MADE ONLY BY THE ENGINEER. CROWN OR OTHERWISE APPROVED IN WRITING BY THE ENGINEER.
- TENSION LAP LENGTHS (MM) SHALL BE:

N12	N16	N20	N24	N28	N32	N36
500	750	1000	1200	1450	1800	2150

THE LAP LENGTH SHALL BE INCREASED BY 40% FOR SLAB BARS SPACED LESS THAN 150MM.
- FABRIC LAP SHALL BE SUCH THAT THE TWO OUTERMOST WIRES OF ONE SHEET OVERLAP THE TWO OUTERMOST WIRES OF THE OTHER SHEET BY 25MM MINIMUM.

25mm MIN.
- A MAXIMUM OF THREE SHEETS OF FABRIC SHALL BE LAPPED AT ANY POINT.
- SITE BENDING OF DEFORMED REINFORCING BARS SHALL BE DONE WITHOUT HEATING USING MECHANICAL BENDING TOOLS.
- WELDING OF REINFORCEMENT IS NOT PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWINGS OR APPROVED BY THE ENGINEER. WHERE WELDING OF REINFORCEMENT IS SPECIFIED BY ENGINEER, COMPLY WITH AS1564.3
- WHERE TRANSVERSE TIE BARS ARE NOT SHOWN PROVIDE N12-300 SPICED WHERE NECESSARY AND LAP WITH MAIN BARS 450MM U.N.O.
- ENGINEER SHALL BE GIVEN 48 HOURS NOTICE FOR REINFORCEMENT INSPECTION & CONCRETE SHALL NOT BE POURED UNTIL FINAL APPROVAL IS OBTAINED.

## CONCRETE MIX TABLE

- GENERAL
- MAX AGG SIZE = 20 MM
- CEMENT TYPE = MARINE
- MAX WATER : CEMENT RATIO = 0.4
- MAX SHRINKAGE STRAIN AT 56 DAYS 600E-6 UM TO AS1012.13
- CURING = 7 DAYS WET CURE
- SLABS AND SLAB ON GROUND IN TIDAL OR SPLASH ZONE.
- EXPOSURE CLASSIFICATION = C
- FC = 50 MPA
- COVER = 65 MM
- SLUMP = 80 MM
- CEMENT CONTENT = 470 KG/M3 (HIGHER TO REDUCE COVER)
- DURABILITY AT 28 DAYS = 1000 COLOMBS.
- NON SHRINK GROUT
- FOSROC CONBEXTRA UW BY PARCHEM 50 MPa
- INSTALL PER MANUFACTURER SPECIFICATIONS

## PRECAST PANELS

- TO BEST INDUSTRY PRACTICE FOR PRECAST CONCRETE
- DO NOT LIFT PANELS FOR 14 DAYS MINIMUM
- PROVIDE ADEQUATE CHAMPHERS TO EDGES TO ENSURE GOOD FINISH
- PROVIDE PROPRIETARY REID 10T LIFT EYES TO ALL PANELS WITH 4 N12 - 900 LONG TRIMMERS AROUND EACH

## SLAB ON GROUND NOTES

- ALL SLAB ON FOOTINGS TO AS2870 UNO
- SOIL TO BE COMPACTED TO AS2870 REQUIREMENTS
- TEST SOIL IF REQUIRED BY ENGINEER BY NATA APPROVED LAB
- TRIM EXISTING FORMATION REMOVING ANY LOOSE MATERIAL INCLUDING SOIL, ROOTS AND ANY OTHER ORGANIC MATERIAL. STORE TOP SOIL AS REQUIRED.
- CLAY SUBGRADE FORMATION IS TO BE MAINTAINED AT OPTIMUM MOISTURE CONTENT 0-3% PRIOR TO COVERING. AREAS TO BE REMOVED & REPLACED WITH A SUITABLE COMPACTED FILL.
- PROOF ROLL NATURAL GROUT & THOROUGHLY COMPACT SUB-GRADE MATERIAL USING MULTIPLE PASSES OF A HEAVY ROLLER TO ACHIEVE A UNIFORM MINIMUM OF 98% STANDARD DENSITY AS DETERMINED BY THE LABORATORY PROCEDURE 1289 E1.1 AS DESCRIBED IN AS1289. METHODS OF TESTING SOILS FOR ENGINEERING PURPOSES
- PLACE FILL IN MAXIMUM 150MM THICK LAYERS TO A MAXIMUM DEPTH OF 750MM UNO IN ACCORDANCE WITH THE FOLLOWING:

-	3	8
-	LOW FINES CONTENT	
-	PROPORTION PASSING 0.075MM SIEVE 25% MAX	
-	PLASTICITY INDEX >2%, <15%	
-	COMPACTION TO 95% STANDARD COMPACTION IN ACCORDANCE WITH AS1289-E1.1 FOR COHESIVE SOILS AND 75% DENSITY INDEX FOR GRANULAR SOILS.	
- INSTALL 50MM SAND BLINDING IF REQUIRED TO SMOOTH SURFACE.
- PLACE 0.2MM POLYTHENE MEMBRANE
- PROVIDE N12 TRIMMER 1500 L TO UNDERSIDE MESH TO ALL REINFORCING JOINTS
- PROVIDE 10MM JOINTS OR APPROVED EQUIVALENT BETWEEN ALL WALLS, COLUMNS AND SLAB TYPICAL.
- CURE CONCRETE USING WET HESSIAN FOR 7 DAYS.
- INSTALL SAWN OR TOOLED JOINTS IN ACCORDANCE WITH THE DRAWINGS
- PROVIDE ALL GRADES TO ADEQUATELY DRAIN WATER TO PITS. REFER TO ARCHITECTS AND HYDRAULIC ENGINEERS DRAWINGS FOR LOCATION OF ALL GRADES, PITS, DRAINS, KERBS, AND SERVICES INFORMATION

## STAINLESS STEEL

- ALL MATERIALS SHALL BE SUPPLIED, MANUFACTURED & INSTALLED IN ACCORDANCE WITH AS1418, AS 4100; AS 1554; 2.0 SUPPLY S.S IN ACCORDANCE WITH ASTM A240 / 480 AND ASTM A276
- CONFORM TO AUSTRALIAN STAINLESS REFERENCE MANUAL ISSUED BY THE AUSTRALIAN STAINLESS STEEL DEVELOPMENT ASSOCIATION ASSDA
- ALL STAINLESS STEEL SHALL BE 316 S MARINE GRADE
- PROTECT S.S DURING FABRICATION TO PREVENT DISCOLORATION BY IRON PARTICLES AND THE LIKE.
- PICKLE & PASSIVATE ALL S.S PLATES & SECTIONS.
- S.S WELDING SHALL BE 6MM TYPE SP USING AN 'OVER ALLOYED ELECTRODE COMPATIBLE WITH THE STRENGTH GRADE OF THE SECTION AT THE WELD.
- REMOVE ANY SHARP EDGES TO CUT SS
- APPLY A LIGHT OIL TO PINS & BEARING SURFACES PRIOR TO INSTALLATION.
- APPROPRIATELY SEIZE ALL STAINLESS STEEL NUTS TO THE BOLT TO PREVENT NUT COMING UNDONE OVER TIME
- TO PREVENT 'GAULING OR PICKUP', ALL STAINLESS STEEL FASTENERS AND ARE TO BE TREATED WITH 'DURALAC' OR EQUIVALENT NICKEL ANTI-SEIZE COMPOUND TO THE BOLT THREAD, PRIOR TO FASTENING.

## S.S BOLTS & FIXINGS

- ALL SS FASTENERS SHALL BE SS CLASS 80
- NO JOINT SHALL HAVE LESS THAN 2 FASTENERS
- S.S BOLTS TO BE GRADE 316 MINIMUM GRADE 50 U.N.O
- ALL SCREWS TO BE COUNTERSUNK SOCKET SCREWS
- EITHER USE NYLON NUTS OR TACK WELD OR OTHERWISE
- APPROPRIATELY SEIZE ALL STAINLESS STEEL NUTS TO THE BOLT TO PREVENT NUT COMING UNDONE OVER TIME
- TO PREVENT 'GAULING OR PICKUP', ALL STAINLESS STEEL FASTENERS AND ARE TO BE TREATED WITH 'DURALAC' OR EQUIVALENT NICKEL ANTI-SEIZE COMPOUND TO THE BOLT THREAD, PRIOR TO FASTENING.

## STRUCTURAL STEELWORK

- ALL MATERIALS AND WORKMANSHIP MUST BE IN ACCORDANCE WITH AS 4100. & ASCE STRUCTURAL STEEL FABRICATION AND SHOP DRAWINGS ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL 7 DAYS BEFORE FABRICATION COMMENCES. FABRICATION MUST NOT COMMENCE WITHOUT ENGINEERS APPROVAL OF WORKSHOP DRAWINGS.
- STEEL GRADE 350 U.N.O
- ALL STEEL MUST BE IN ACCORDANCE WITH AS 3678 GRADE 250, AS 3679 GRADE 300 FOR T OR I SECTIONS, AS 1163 GRADE 350 HOLLOW SECTIONS.
- ALL STEEL TO BE GALVANISED TO 600 GM/2 TO AS1650 UNLESS OTHERWISE PROTECTED BY PAINT COATING OR HDPE SLEEVE
- MINIMUM STEEL PLATE THICKNESS SHALL BE 8MM UNO.
- ALL PLATES SHALL BE 8MM UNO
- FABRICATION MUST COMPLY TO AS 4100 SECTION 14.
- ERECTION MUST COMPLY TO AS 4100 SECTION 15.
- THE FABRICATION AND ERECTION OF THE STEELWORK MUST BE SUPERVISED BY A QUALIFIED ENGINEER
- CONTRACTOR TO PROVIDE ALL MATERIALS, CLEATS AND TO DRILL ALL HOLES NECESSARY FOR FIXING THE STEEL IN PLACE WHETHER OR NOT SHOWN IN DRAWINGS
- ALL DIMENSIONS AND SETOUTS TO BE OBTAINED FROM ARCHITECTURAL DRAWINGS WHERE NOT INDICATED ON STRUCTURAL DRAWINGS.
- PROVIDE SEAL PLATES TO ALL HOLLOW SECTIONS, WITH PREPARED HOLES WHERE MEMBER IS TO BE GALVANIZED
- PREPARED HOLES FROM TWISTS AND DISTORTIONS BEFORE AND AFTER WELDING.
- WHERE THE FABRICATOR PROVIDES A SPLICE FOR AN APPROVED REASON (EG. TRANSPORTATION) THE SPLICE SHALL BE COMPLETE PENETRATION BUTT WELDED (CATEGORY SP) AND TESTED AS SPECIFIED

## BOLTING STEELWORK

- ALL BOLTING TO AS 4100
- ALL BOLTS SHALL BE MINIMUM GRADE 8.8/5 UNO
- ALL BOLTS, NUTS WASHER TO BE HOT DIPPED GALVANIZED UNO
- NO CONNECTION SHALL HAVE LESS THAN 2 BOLTS UNO
- BOLT DESIGNATION 8.8/5 - HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED TO AS 4100 AS A BEARING JOINT
- 8.8/TF - HIGH STRENGTH STRUCTURAL BOLTS FULLY TENSIONED TO AS 4100 AS A FRICTION JOINT WITH FACING SURFACES UNCOATED
- 8/TFB AND /TFB BOLTS TO BE INSTALLED IN ACCORDANCE WITH AS 4100 SECTION 15, USING APPROPRIATE LOAD INDICATING WASHERS USING EITHER THE PART TURN METHOD OR DIRECT TENSION INDICATOR METHOD.

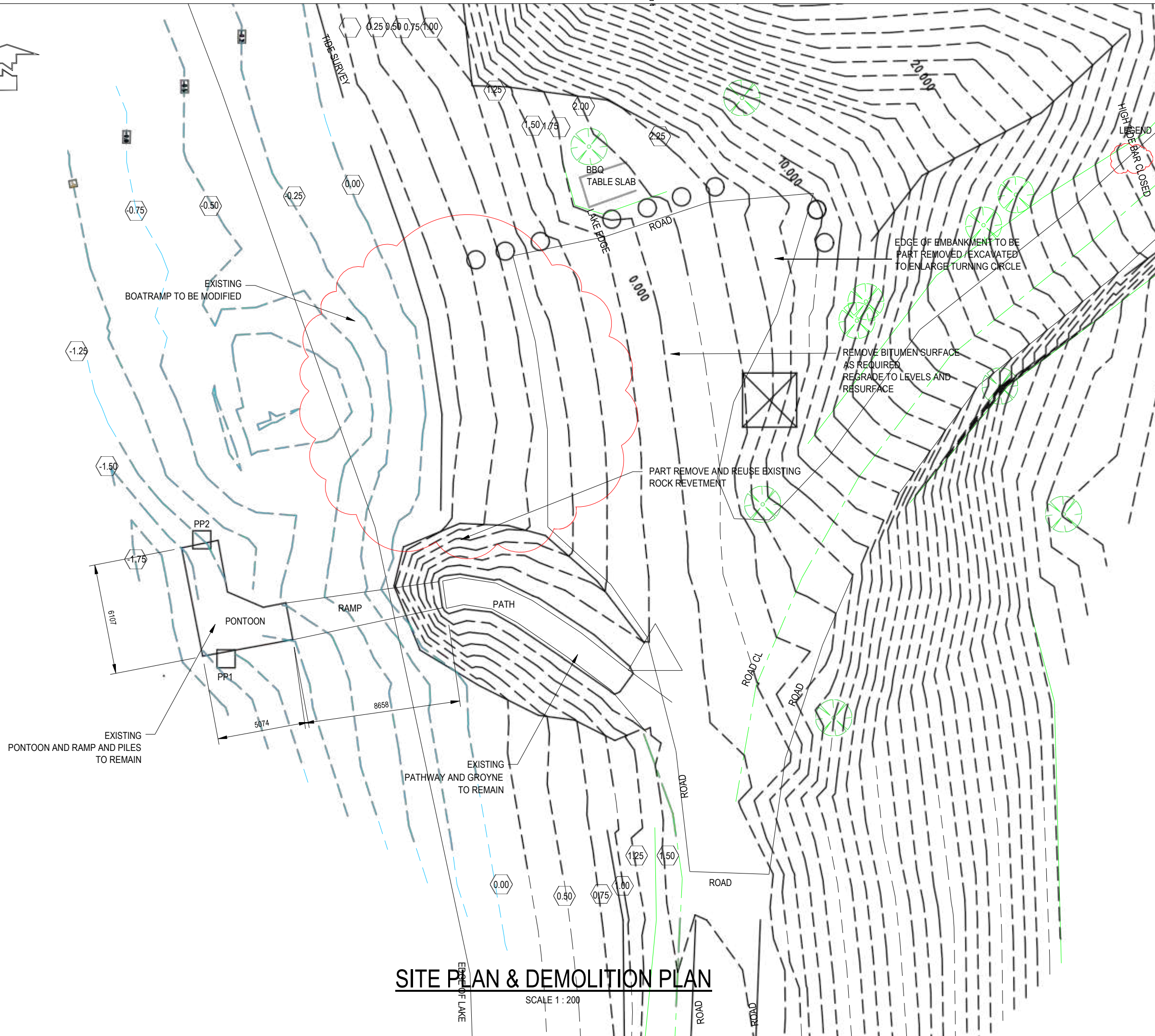
## WELDING

- ALL WELDING TO BE CARRIED OUT IN ACCORDANCE WITH AS1554 BY SKILLED TRADESMEN.
- BUTT WELDS MUST BE FULL PENETRATION BUTT WELDS UNO AND DEVELOP THE ULTIMATE TENSILE STRENGTH OF THE MEMBER.
- FILLET WELDS SHALL BE CONTINUOUS WELDS 6 MM TYPE SP USING 484X8 ELECTRODES.
- SURFACES TO BE WELDED MUST BE SMOOTH, FREE OF ALL SCALE, RUST, GREASE, PAINT, SALT OR ANY OTHER FOREIGN MATERIAL. CONTACT BEARING SURFACES MUST BE FLUSH WITH NO VOIDS UNDER.
- WELDING IS TO BE EXAMINED BY AN INDEPENDENT NATA TESTING AUTHORITY TO AS2207 AS FOLLOWS.  
FILLET SP VISUAL 100% OF LENGTH  
BUTT WELD SHOP VISUAL 100% OF LENGTH  
BUTT WELD SHOP NDT/ULTRASONIC 10% LENGTH  
BUTT WELD SITE VISUAL 100% OF LENGTH  
BUTT WELD SITE NDT/ULTRASONIC 20% LENGTH
- ALL WELDS ARE TO BE MAINTAINED AND SUBMITTED TO THE SUPERINTENDENT.
- THE SUPERINTENDENT MAY AT HIS DISCRETION MAY REQUIRE THAT THE CONTRACTOR CARRY OUT TESTING OF WELDS BY RADIOGRAPHIC TESTING TO AS 2177.1 OR ADDITIONAL ULTRASONIC TESTING OR OTHER MEANS.
- ANY FURTHER TESTING REQUIRED AS A RESULT OF THE DISCOVERY OF A DEFECTIVE WELD SHALL BE CARRIED OUT AT THE CONTRACTOR'S EXPENSE. ANY WAITING TIME DUE TO CARRYING OUT THE ABOVE TESTS SHALL BE AT THE CONTRACTOR'S EXPENSE
- DEFECTIVE PORTIONS OF WELDS SHALL BE REMOVED, RE-WELDED AND RE-INSPECTED. FULL RECORDS SHALL BE KEPT OF ALL REPAIRS.
- THE CONTRACTOR SHALL PROVIDE ACCESS AT ALL REASONABLE TIMES AND ALL FACILITIES NECESSARY FOR INSPECTION DURING MANUFACTURE AND ON COMPLETION. THE CONTRACTOR SHALL SUPPLY TEST CERTIFICATES AND EVIDENCE THAT ALL MATERIALS OR PARTS CONFORM WITH THE TESTS REQUIRED.

## INSPECTIONS & TESTING

- THE CONTRACTOR MUST UNDERTAKE APPROPRIATE INSPECTIONS AND TESTING TO DEMONSTRATE COMPLIANCE WITH THE REQUIREMENTS OF THE SPECIFICATION.
- WORK SHALL NOT BE APPROVED NOR PRACTICAL COMPLETION GIVEN WITHOUT ADEQUATE INSPECTION BY THE ENGINEER. SUCH INSPECTION SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OF HIS RESPONSIBILITIES UNDER THIS CONTRACT.
- THE CONTRACTOR SHALL PERFORM ANY TESTS WHICH THE ENGINEER MAY REASONABLY DIRECT THE CONTRACTOR TO ENGAGE TO DEMONSTRATE THE INTEGRITY, FUNCTIONALITY, QUALITY OR STANDARD OF THE WORK.
- CONTRACTOR MUST GIVE ADEQUATE 24 HOUR NOTICE FOR ENGINEER TO INSPECT THE FOLLOWING MIN





1.0 REFER TO GENERAL NOTES & SPECIFICATION  
2.0 ALL HYDROGRAPHIC DATA TO COUNCIL HYDRO  
3.0 ALL LEVELS TO CHART DATUM 0.0 = AHD -0.925  
4.0 PLAN IS BASED ON COUNCIL DIGITAL DATA

EX. ROAD

PP1 - PP2 323 CHS

NOT TO BE USED FOR CONSTRUCTION

C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

REVISION COMMENTS DATE  
CLIENT

BEGA VALLEY SHIRE COUNCIL

## PROPOSED ALTERATIONS & ADDITIONS

### BEAUTY POINT BOATRAMP

# SITE PLAN & DEMOLITION PLAN

DRUM                      DESIGNED  
STEVE FITZHENRY B.E

PROJECT NO	PAPER SIZE	SHEET NO	ISSUE
17.05034	A3	S01	C





PLAN  
S11

NEW 2 LANE CONCRETE  
BOATRAMP  
REFER DRAWING S11

NEW 1.0 M  
ROCK EXTENSION  
REFER S11

ADJACENT  
JETTY TO REMAIN

EXISTING  
GROYNE

INSTALL NEW BITUMEN  
ROAD TO MATCH  
NEW RAMP LEVELS  
BY OTHERS

INSTALL NEW BITUMEN  
ROAD TO MATCH  
NEW RAMP LEVELS  
BY OTHERS

NEW MANOEUVERING  
AREA BY OTHERS  
REFER BEGA VALLEY SHIRE COUNCIL  
DRAWINGS  
REGRADE MANOEUVRE AREA  
AND RE-BITUMEN SURFACE  
AND EXTEND ROADWAY  
PROVIDE APPROPRIATE DRAINS  
FOR OVERLAND FLOW  
TO COUNCIL DETAILS

BANK  
BY OTHERS  
PLAN DIMENSION ONLY

ANY DISTURBANCE OR DAMAGE TO THE EXISTING  
STRUCTURES OR GROUNDS SHALL BE  
REINSTATED TO ORIGINAL CONDITION PRIOR TO  
DISESTABLISHMENT FROM SITE

## NOTES:

- 1.0 REFER TO GENERAL NOTES & SPECIFICATION
- 2.0 ALL LEVELS & HYDROGRAPHIC DATA  
TO COUNCIL SURVEY
- 3.0 TRAFFIC AND PARKING TO AS 2890.1 BY COUNCIL
- 4.0 ALL SETOUT BY CONTRACTOR USING A  
REGISTERED SURVEYOR
- 5.0 DLT DESIGN LOW TIDE  
DHT DESIGN HIGH TIDE

## LEGEND

RED LINES - PROPOSED WORKS

## PILE SCHEDULE

PP1, PP2 EXISTING PONTOON PILE  
STEEL PILE 406 \* 12.7 CHS CUT OFF RL2.83  
TO REMAIN BUT EXTEND TO RL3.85  
1.7+ 1( 00 +3( 6/(9(  
OVER AT 8.0M  
DRIVE 3.0M INTO SEA BED  
FULLY SEAL WITH WELDED CAP AND BUNG  
NEW WHITE CONE CAP  
SIKAFLEX ON TO HDPE

## MEMBER SCHEDULE

PS1 PRECAST CONCRETE SLAB  
GB1 CONCRETE GROUND BEAM  
600D \* 450W  
KERB 1 PRECAST CONCRETE WHEELSTOP KERB  
BY DENLIZ TRADING 1650 L \* 90H  
50 GAP BETWEEN PLANKS  
1.7+ 6 6 \$/7+5(\$%2/76  
CHEMSET INTO SLAB  
WITH RECESSED NUTS AND WASHERS

## SETOUT COORDINATES

SET OUT POINT (S.O.P)	X	Y
1	236509.2276	5970066.6722
2	236510.8272	5970058.4259
3	236494.0677	5970055.1763
4	236492.4684	5970063.4211

Drawing Status

**TENDER**

NOT TO BE USED FOR CONSTRUCTION

C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

REVISION COMMENTS DATE

BEGA VALLEY SHIRE COUNCIL

PROJECT  
PROPOSED ALTERATIONS & ADDITIONS  
BEAUTY POINT BOATRAMP

GENERAL ARRANGEMENT

DESIGNED BY  
STEVE FITZHENRY B.E

PROJECT NO 17.05034 PAPER SIZE A3 SHEET NO S10 ISSUE C

**LM** Land & Marine  
engineering consulting  
structural & maritime engineers  
ABN: 17443 645 973 P: 0411 316 315 E: steve@landmarine.com.au  
33 HORDERN LANE BUNDEENA SYDNEY NSW 2230

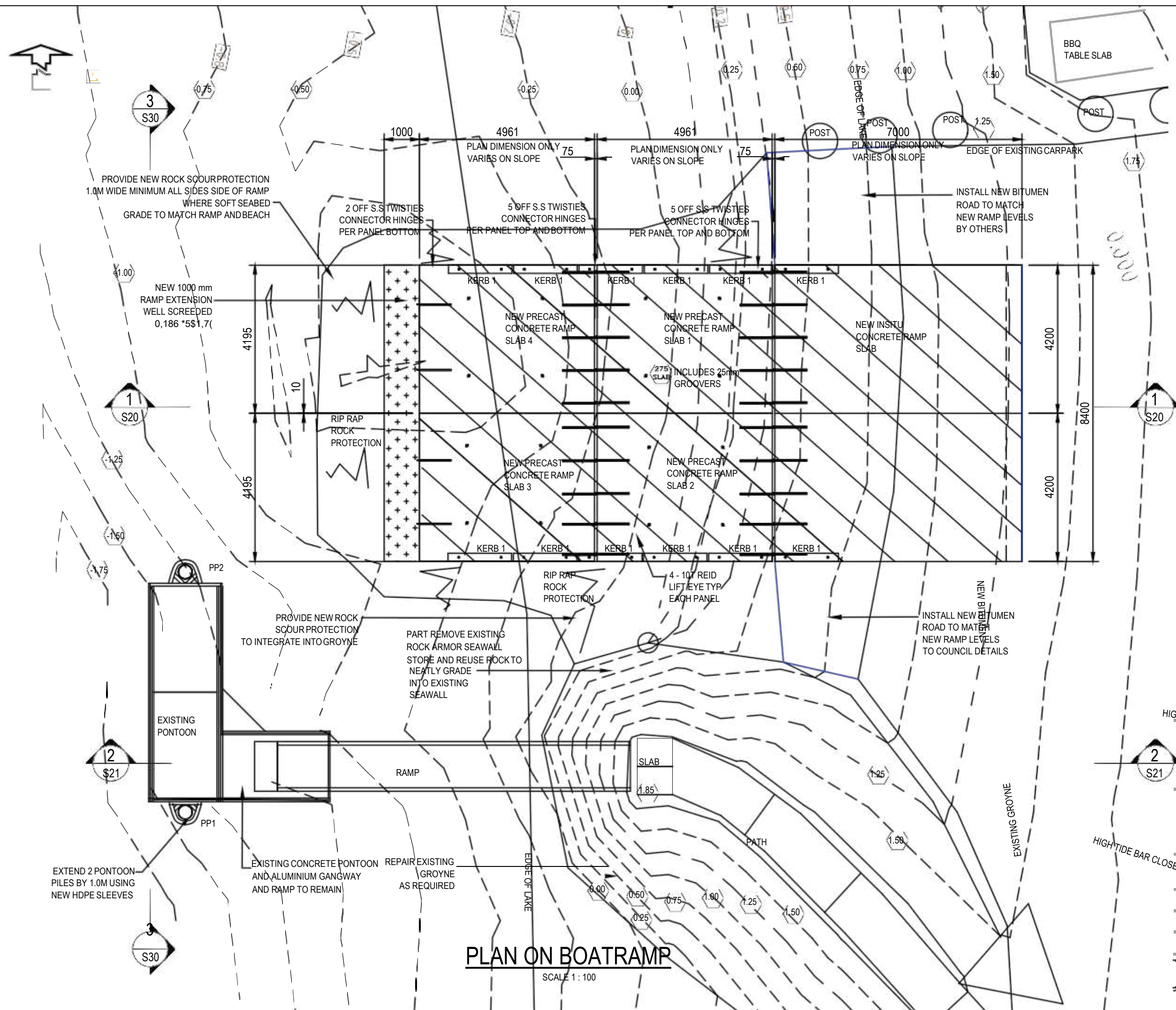
## BERTHING AND MOORING NOTE

- 1.0 VESSELS ARE TO BERTH FACILITY IN A CONTROLLED  
MANNER IN KEEPING WITH PROCEEDURE  
DEVELOPED BY A COMPETANT SKILLED  
PROFESSIONAL OWNER/ CAPTAIN
- 2.0 DO NOT BERTH STRUCTURE UNDER ADVERSE  
WEATHER CONDITIONS

# GENERAL ARRANGEMENT

SCALE 1: 200





- ## NOTES:
- 1.0 REFER TO GENERAL NOTES & SPECIFICATION
  - 2.0 REFER MEMBER SCHEDULE S10
  - 3.0 ALL LEVELS & HYDROGRAPHIC DATA  
TO COUNCIL SURVEY
  - 4.0 TRAFFIC AND PARKING TO AS 2890.1  
BY COUNCIL
  - 5.0 ALL SETOUT BY CONTRACTOR USING  
A REGISTERED SURVEYOR
  - 6.0 DLT DESIGN LOW TIDE  
DHT DESIGN HIGH TIDE

Drawing Status

**TENDER**

NOT TO BE USED FOR CONSTRUCTION

HIGH TIDE BAR CLOSED

C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

REVISION COMMENTS DATE

---

CLIENT

**BEGA VALLEY SHIRE COUNCIL**

HIGH TIDE BAR CLOSED

PROJECT PROPOSED ALTERATIONS & ADDITIONS  
BEAUTY POINT BOATRAMP

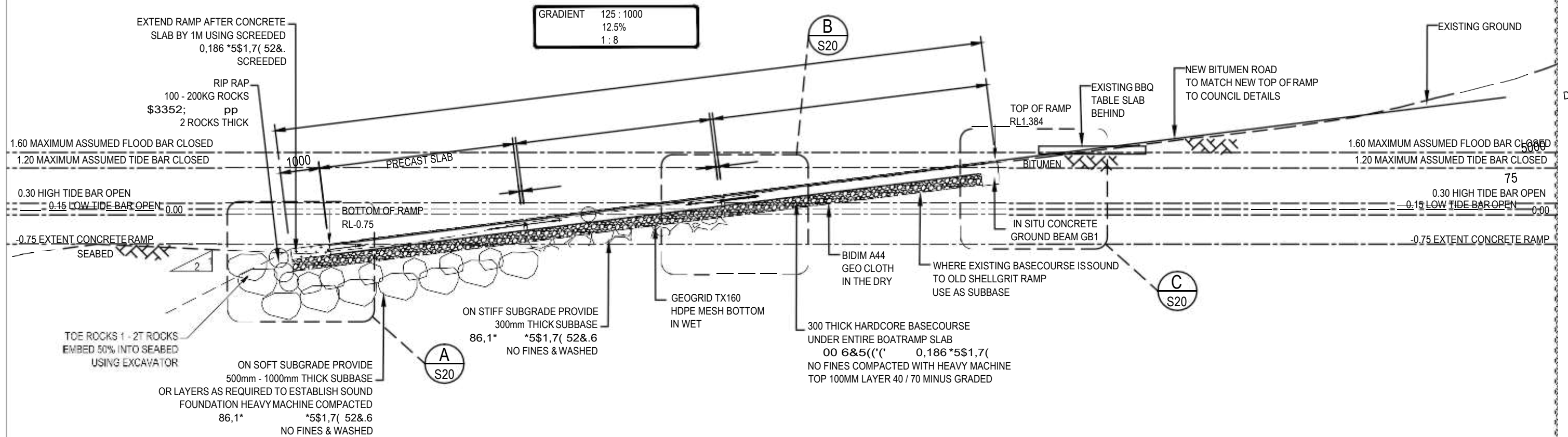
## GENERAL ARRANGEMENT

STEVE FITZHENRY B.E

PROJECT NO	PAPER SIZE	SHEET NO	ISSUE
17.05034	A3	S11	C

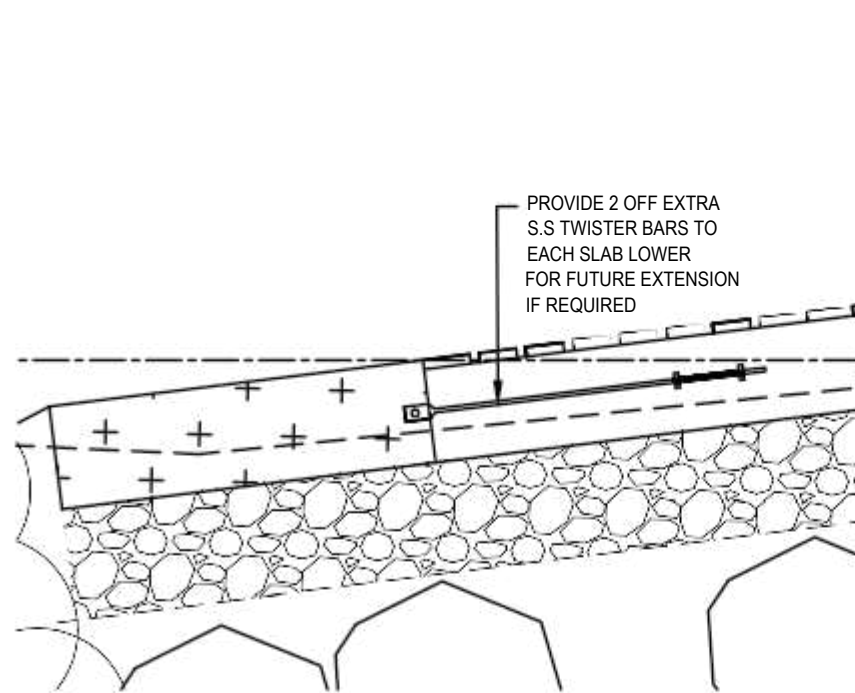


NOTES:  
1.00 REFER TO GENERAL NOTES & SPECIFICATION

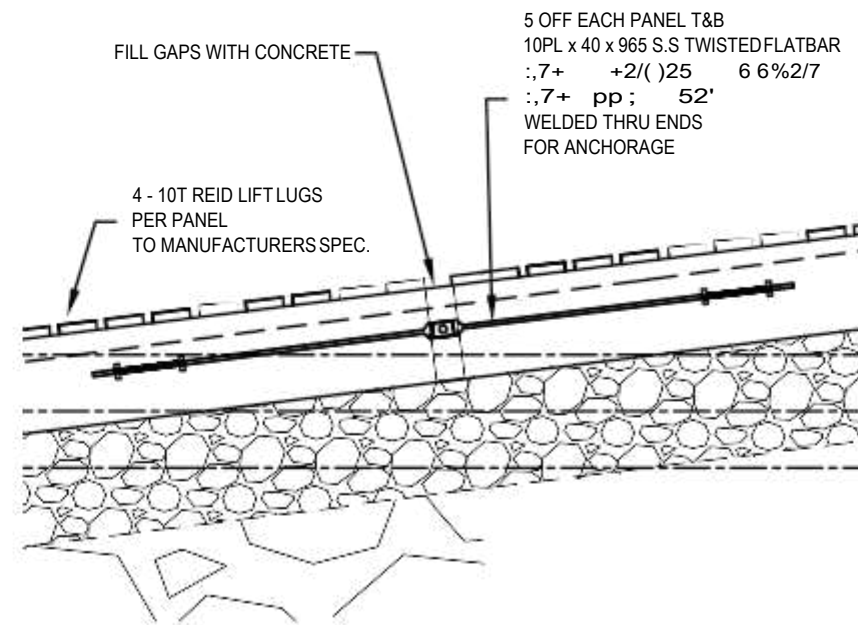


SECTION 1  
SCALE 1:100  
S11

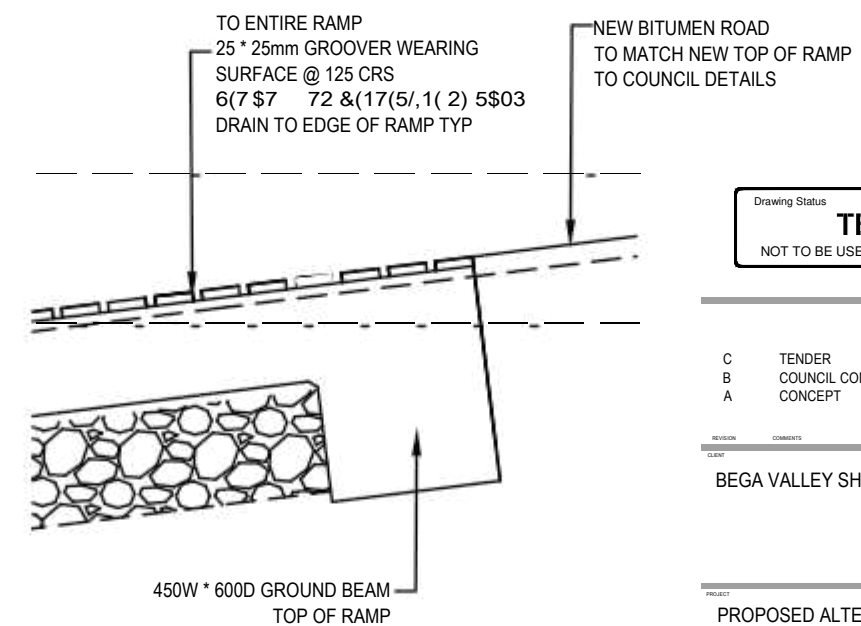
FILL NOTE  
ALL FILL TO BE WASHED PRIOR TO INSTALL TO ENSURE NO FINES ENTER WATER



DETAIL A  
SCALE 1:20



DETAIL B  
SCALE 1:20



DETAIL C  
SCALE 1:20

Drawing Status  
**TENDER**  
NOT TO BE USED FOR CONSTRUCTION

C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

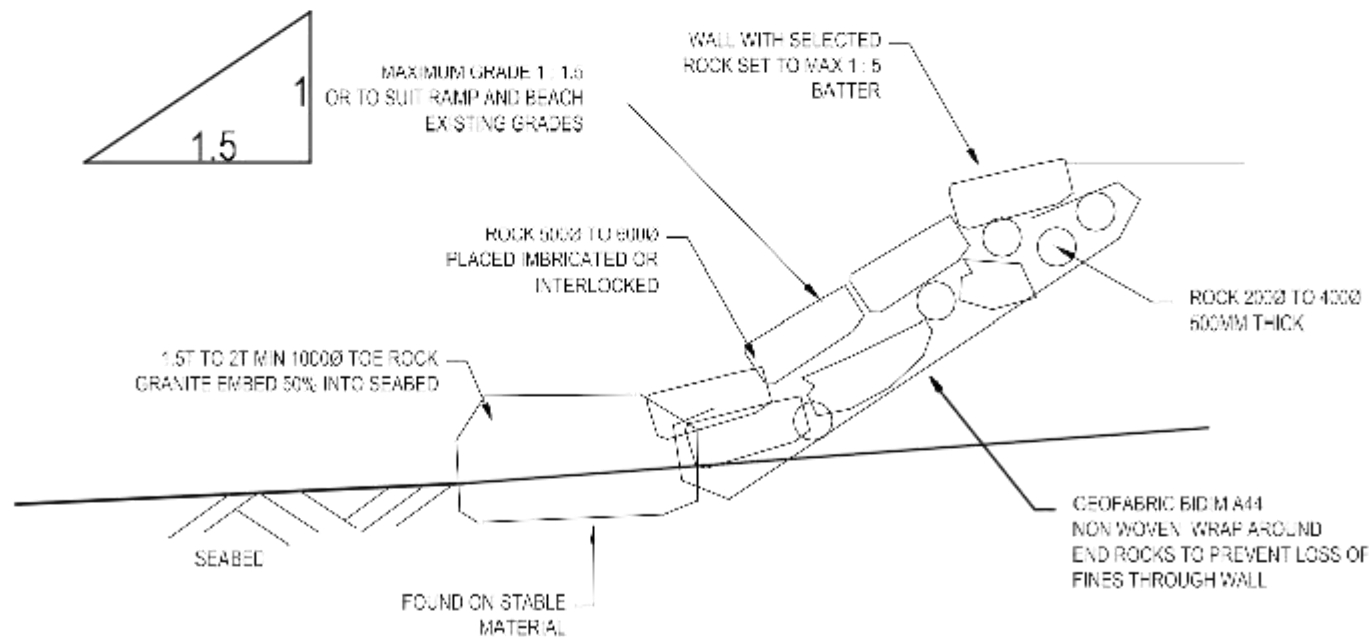
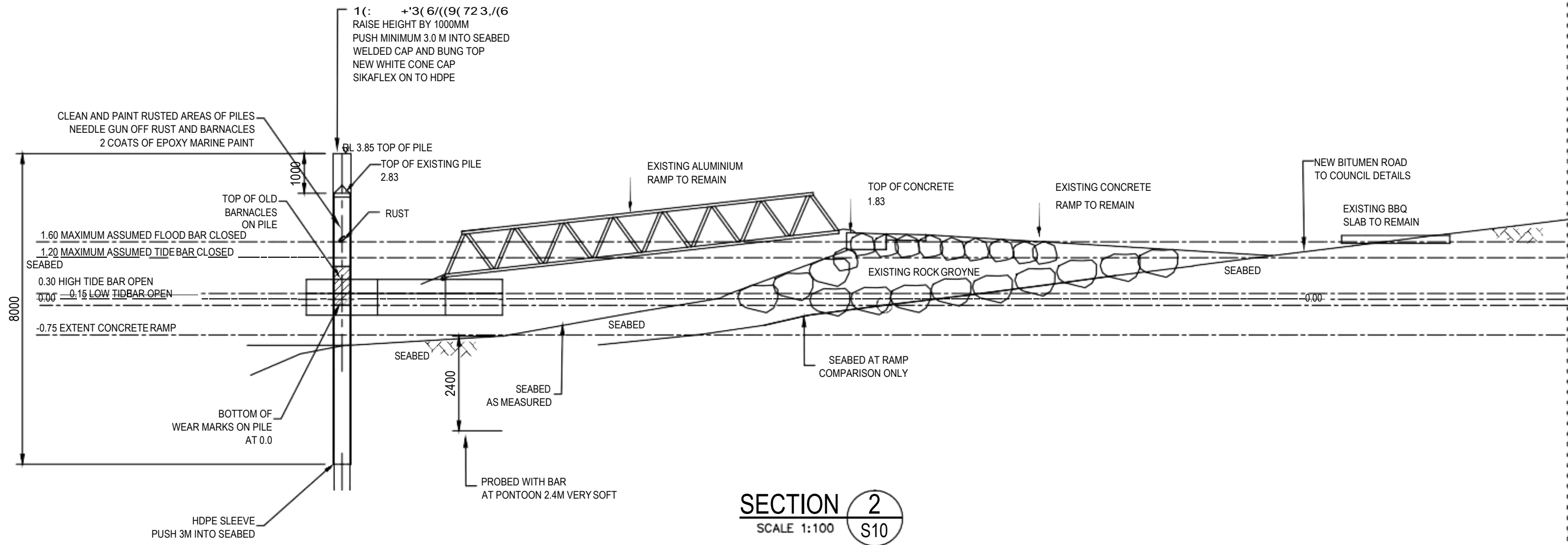
BEGA VALLEY SHIRE COUNCIL

PROPOSED ALTERATIONS & ADDITIONS  
BEAUTY POINT BOATRAMP

SECTION ON WHARF

STEVE FITZHENRY B.E

17.05034 A3 S20 C



HDPE PILE SLEEVES

1. HDPE SHALL BE TAKEN TO MEAN HIGH DENSITY POLYETHYLENE
2. ALL STEEL PILE S TOGETHER WITH ATTACHMENTS SHALL BE PROTECTED AGAINST CORROSION FROM THE TOP OF THE PILE DOWN TO 3.0M INTO THE SEABED USING HDPE SLEEVES
3. MINIMUM WALL THICKNESS 9.0mm HDPE
4. DIAMETER OF SLEEVE TO SUIT STEEL PILE
5. HDPE SLEEVES TO BE FACTORY WELDED TO CORRECT LENGTH AND HAVE TOP CAP WELDED IN FACTORY PRIOR TO DELIVERY
6. CONTRACTOR SHALL ESTABLISH THE GROUND CONDITIONS AND DETERMINE SLEEVE LENGTHS IN ADVANCE
7. THE HDPE SLEEVE SHALL BE FULLY AIR-SEALED TO PREVENT ANY OXYGEN REACHING THE STEEL PILE BY WELDING A PROPRIETARY CAP TO THE TOP OF THE SLEEVE
8. DO NOT PENETRATE THE HDPE SLEEVE TO INSTALL ANY ATTACHMENTS OR BOLTS
9. WELDED CAPPED SLEEVES DURING DRIVING TO HAVE A 12MM +2/(-0.5), 0.80 72 7+ (723 2) 7+ ( &\$3 72 \$/2: \$,5 72 EXIT.
10. THIS HOLE SHALL BE FULLY SEALED AFTER PILING BY INSTALLING STAINLESS STEEL SCREW AND STAINLESS STEEL 75 SQ \* 5 MM PLATE WITH LIBERAL SIKAFLEX TO SEAL.
11. FINALLY A WHITE CONE CAP SHALL BE INSTALLED OVER THE SLEEVE AND SIKAFLEX APPLIED LIBERALLY TO SEAL

PAINTING STEEL PILES

- 1.0 ALL SURFACES SHALL BE PREPARED BY NEEDLE GUN ALL RUST OFF AND WASH IN FRESH WATER
- 2.0 THE SPECIFIED PAINT SYSTEM SHALL CONSIST OF:-
  - COAT 1  
HIGH BUILD HIGH SOLIDS 2-PACK EPOXY COATING, APPLIED IN AT LEAST TWO COATS, AND MORE COATS IF NECESSARY, TO AN AVERAGE DFT OF 300 UM.
  - COAT 2  
STRIPE COAT TO ALL WELDS AND SEAMS TO 75 UM
  - COAT 3  
HIGH BUILD HIGH SOLIDS 2-PACK EPOXY COATING APPLIED IN AT LEAST TWO COATS, AND MORE COATS IF NECESSARY, TO AN AVERAGE DFT OF 300 UM.
- 3.0 THE COATING SHALL BE A TWO-PACK HIGH BUILD EPOXY COATING, SUITABLE FOR THIS USE AND MEETING THE REQUIREMENTS OF AS 3750.14. COATING SHALL BE RECOMMENDED BY THE MANUFACTURER FOR THIS USE AND WITH THE SELECTED FINISH COAT WHERE APPROPRIATE. RECOMMENDED PRODUCTS INCLUDE:-
  - AMERLOCK 400 FROM AMERON COATINGS
  - BAR-RUST 256 FROM ALTEX COATINGS
  - INTERZONE 954 FROM INTERNATIONAL COATINGS
  - DEVSHIELD 236
- 4.0 THE HIGH BUILD EPOXY COATING SHALL BE APPLIED IN TWO OR MORE COATS TO AN AVERAGE DRY FILM THICKNESS OF, AT LEAST 80 : 7+ \$ MINIMUM DRY FILM THICKNESS AT \$1 < 21 ( /28\$7.21 2) 80
- 5.0 TEST PROTECTIVE COATING TO AS 3894.1 AND MAKE GOOD ANY DEFECTS.
- 6.0 RECTIFICATION OF DEFECTS - ON-SITE REPAIR OF SCRATCHED AND SLIGHTLY DAMAGED AREAS OF THE COATING SHALL BE CARRIED OUT USING THE SAME PROCEDURES AS FOR INITIAL APPLICATION, AFTER FIRST WASHING DOWN WITH FRESH WATER TO REMOVE SALT CONTAMINATION FROM THE SURFACE. ANY ( ;326( ' 67( ( / 6+ \$ / ( % ( 6327 % / \$67( ' 72 \$6 CLASS SA 3.

Drawing Status  
**TENDER**  
NOT TO BE USED FOR CONSTRUCTION

C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

BEGA VALLEY SHIRE COUNCIL

PROPOSED ALTERATIONS & ADDITIONS  
BEAUTY POINT BOATRAMP

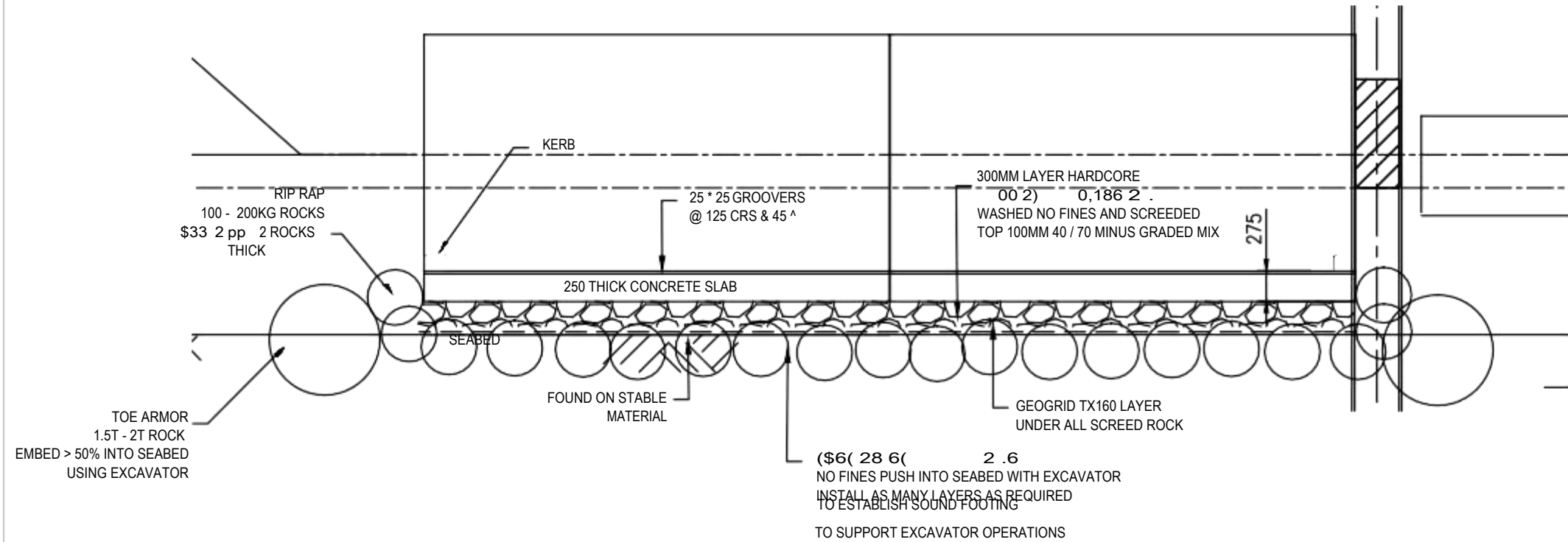
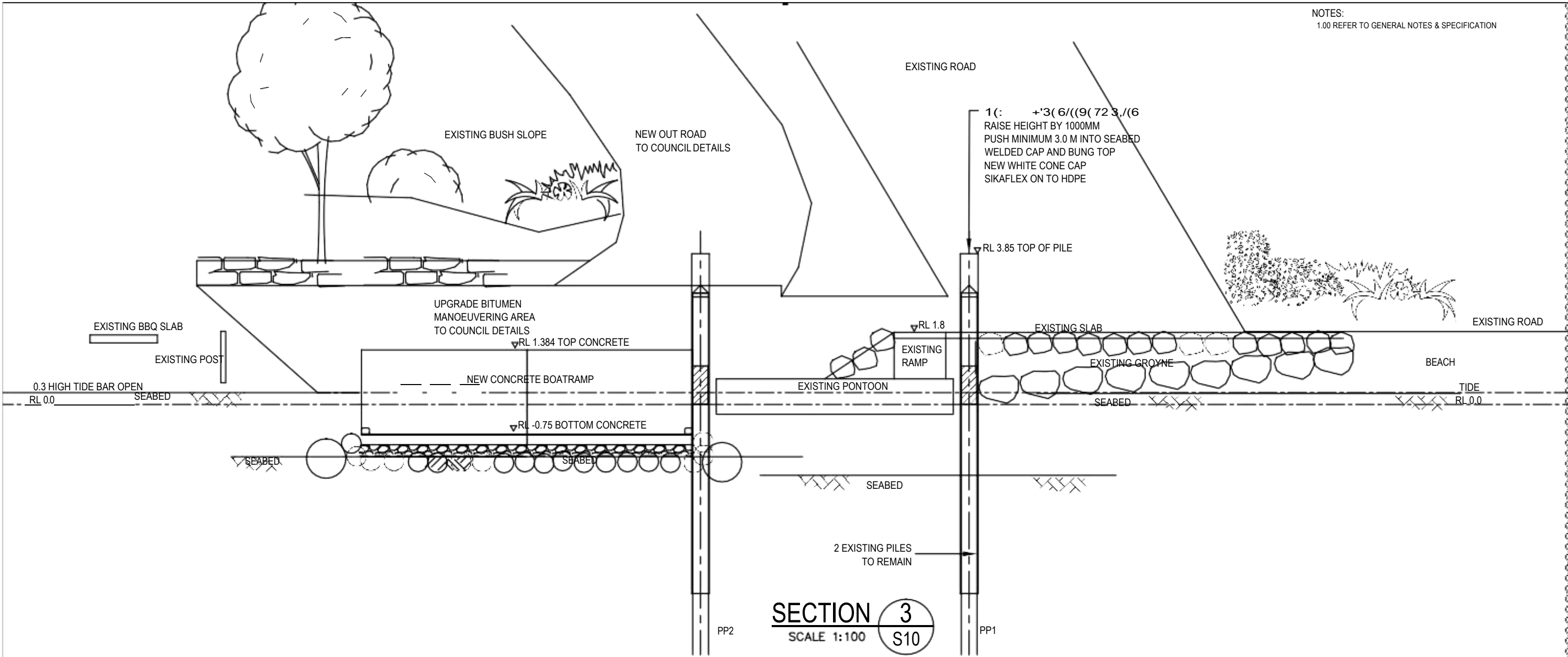
SECTION ON PONTOON

STEVE FITZHENRY B.E

17.05034 A3 S21 C



NOTES:  
1.00 REFER TO GENERAL NOTES & SPECIFICATION



Drawing Status  
**TENDER**  
NOT TO BE USED FOR CONSTRUCTION

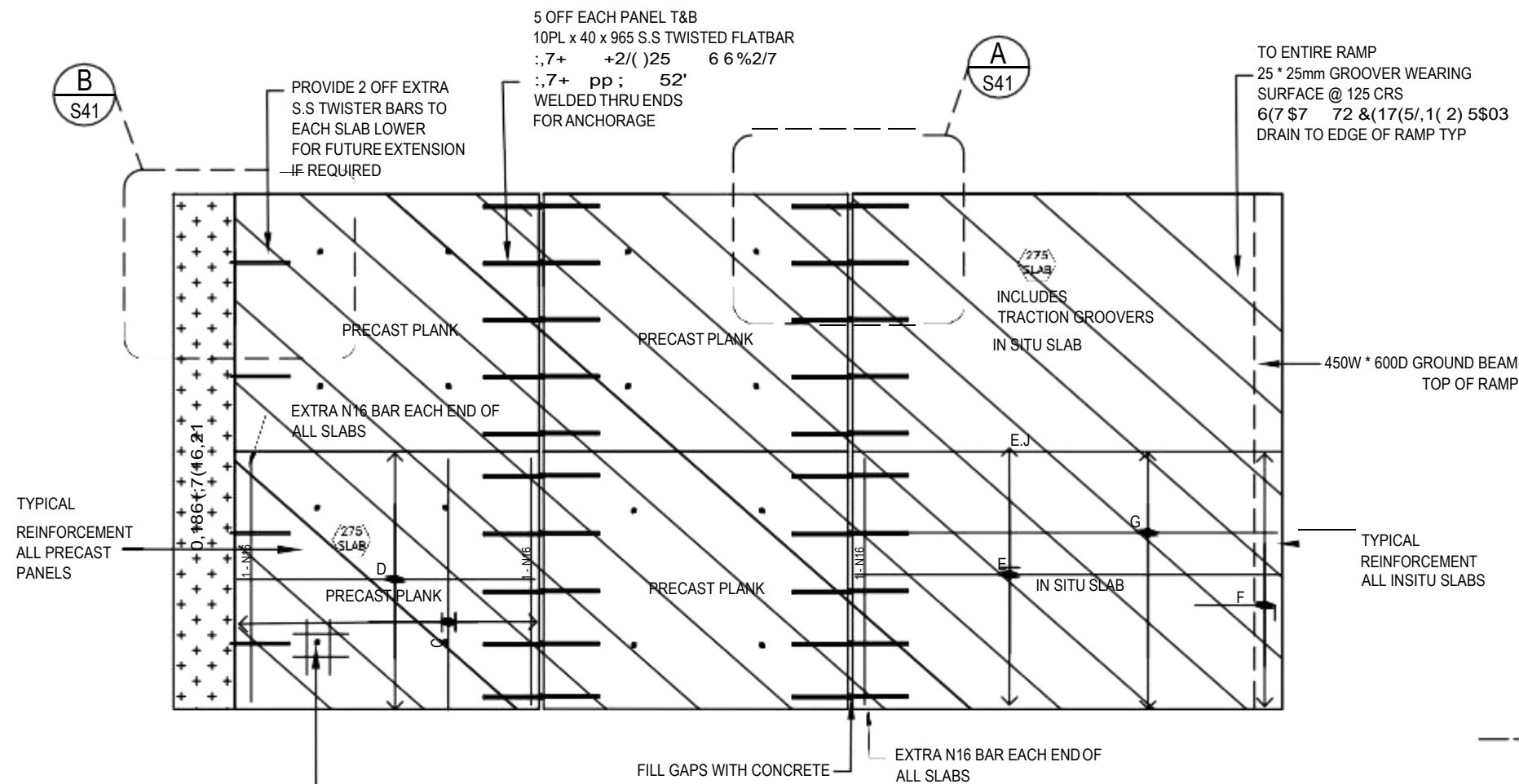
C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

REVISION COMMENTS DATE  
CLIENT  
BEGA VALLEY SHIRE COUNCIL

PROJECT  
PROPOSED ALTERATIONS & ADDITIONS  
BEAUTY POINT BOATRAMP

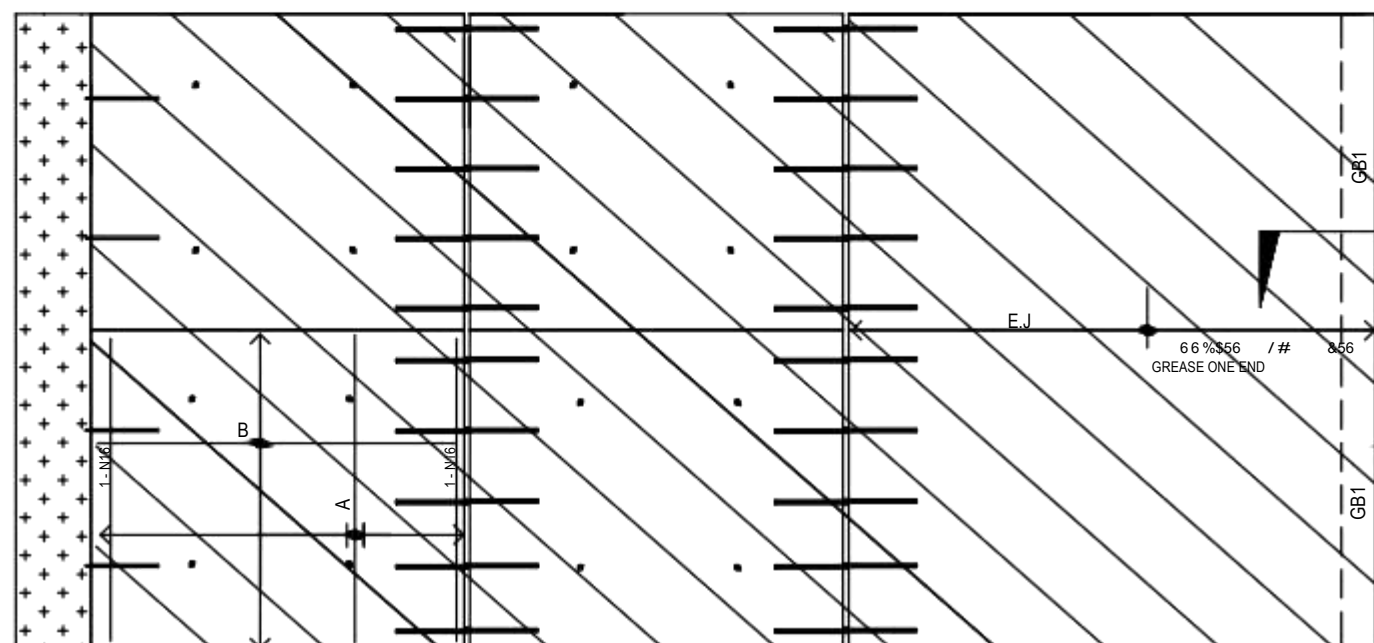
DESIGNER  
STEVE FITZHENRY B.E

PROJECT NO 17.05034 PAPER SIZE A3 SHEET NO S30 ISSUE C



## PLAN ON TOP REINFORCEMENT

SCALE 1 : 100



## PLAN ON BOTTOM REINFORCEMENT

SCALE 1 : 100

- NOTES:
- 1.0 REFER TO GENERAL NOTES & SPECIFICATION
  - 2.0 ALL HYDROGRAPHIC DATA BY COUNCIL
  - 3.0 PRECAST PANEL LENGTH IS DIFFERENT TO PILE SETOUT DUE TO SLOPE

### LEGEND

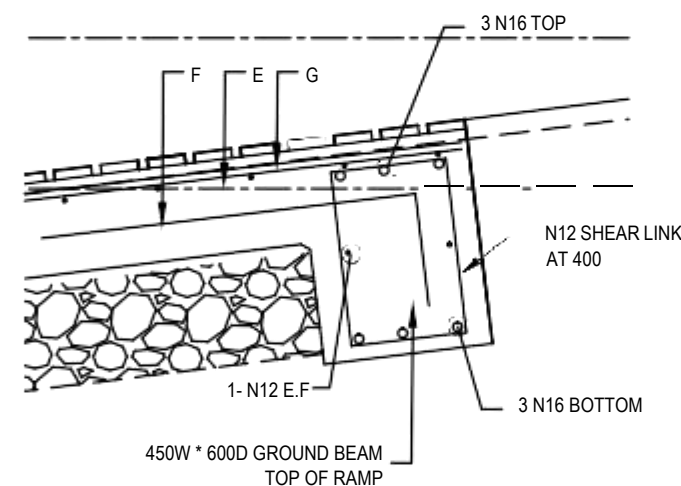


### CONCRETE NOTES

- 1.0 EXPOSURE CLASSIFICATION C
- 2.0 CONCRETE STRENGTH 50 MPa MINIMUM @ 28 DAYS
- 3.0 BARS AS SHOWN
- 4.0 65mm COVER
- 5.0 TYPICAL SLAB SHOWN
- 6.0 ALL REINFORCEMENT SHALL BE GALVANISED
- 7.0 STAGGER ANY MESH JOINTS SO THERE IS NO CONTINUOUS JOINT BETWEEN SHEETS

### REINFORCEMENT NOTES

A	5	0(6+ % :7+ %5 %27720
B	N16 AT 150 CRSB2	
C	5	0(6+ 7 :7+ %5 %27720
D	N16 AT 150 CRS T4	
E	6/ *\$ / 0(6+ 7 :7+ %5 %723	
F	N16 - 300 L-BAR T2 - 1300 L	
G	N16 - 600 T2	



## SECTION 1

SCALE 1: 20

Drawing Status  
**TENDER**  
NOT TO BE USED FOR CONSTRUCTION

C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

BEGA VALLEY SHIRE COUNCIL

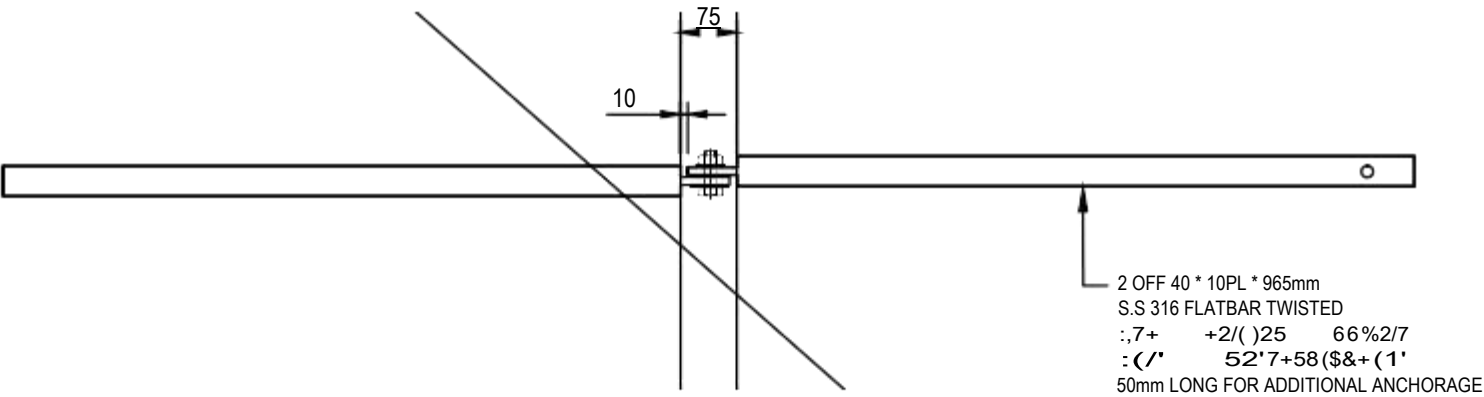
PROPOSED ALTERATIONS & ADDITIONS  
BEAUTY POINT BOATRAMP

REINFORCEMENT PLAN

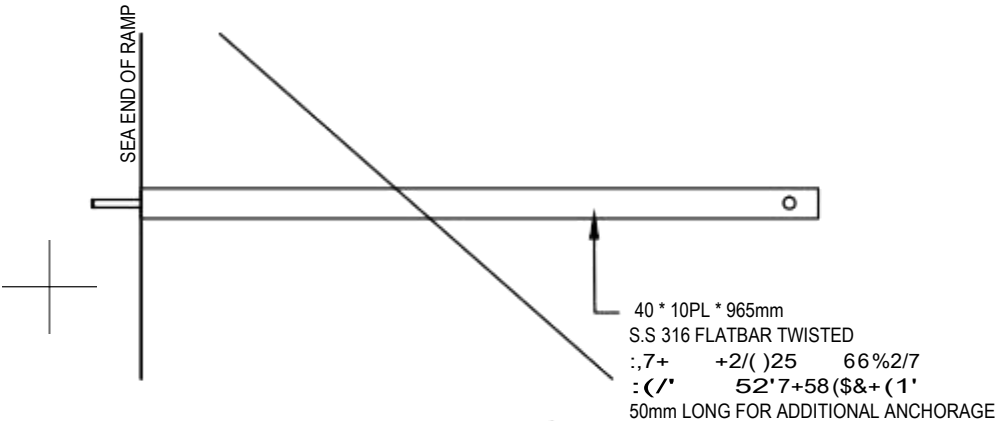
STEVE FITZHENRY B.E

17.05034 A3 S40 C

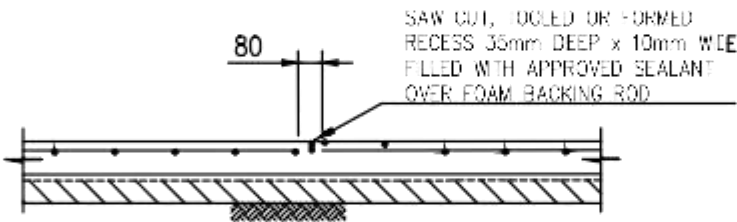




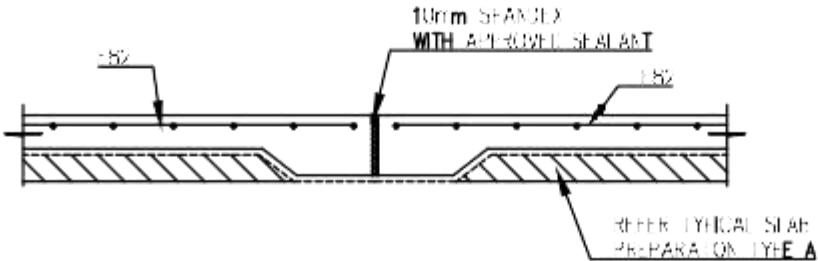
DETAIL A  
SCALE 1:10  
S40



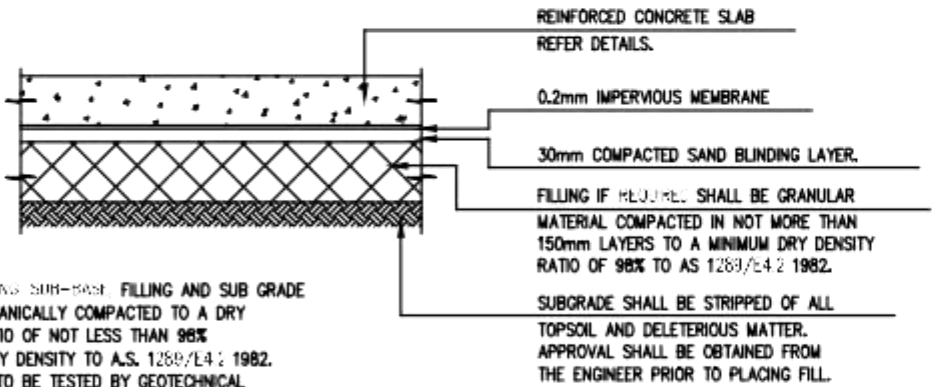
DETAIL B  
SCALE 1:10  
S40



CONTRACTION JOINT DETAIL  
DENOTED C.J. ON PLAN  
SCALE = NTS

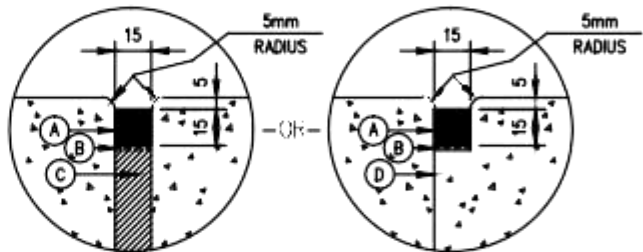


EXPANSION JOINT DETAIL  
DENOTED E.J. ON PLAN  
SCALE = NTS



NOTE:  
SAND BLINDING, SUB-BASE, FILLING AND SUB GRADE TO BE MECHANICALLY COMPACTED TO A DRY DENSITY RATIO OF NOT LESS THAN 98% MAXIMUM DRY DENSITY TO A.S. 1289/t42 1982. ALL AREAS TO BE TESTED BY GEOTECHNICAL ENGINEER AND RESULTS FORWARDED TO STRUCTURAL ENGINEER PRIOR TO POURING CONCRETE.

TYPICAL SLAB PREPARATION TYPE A  
SLAB ON GRADE



- (A) - THIOFLEX 600 POURING OR GUN GRADE SEALANT BY PARBURY TECHNOLOGIES OR APPROVED EQUIVALENT.  
(B) - POLYETHYLENE TAPE BOND BREAKER  
(C) - FLEXIBLE FOAM OR SELF EXPANDING CORK REFER DETAILS  
(D) - KEYED JOINT OR SAW CUT JOINT

NOTE:  
THIOFLEX 600 POURING GRADE IS SUITABLE ONLY FOR HORIZONTAL JOINTS WITH SOUND BACKING. FOR INCLINED OR VERTICAL JOINTS THIOFLEX 600 GUN GRADE SHOULD BE USED. BOTH GRADES OF THIOFLEX 600 SHALL BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.

TYPICAL JOINT SEALANT DETAILS  
N.T.S.

Drawing Status  
**TENDER**  
NOT TO BE USED FOR CONSTRUCTION

C	TENDER	180322
B	COUNCIL COMMENT	171212
A	CONCEPT	171030

BEGA VALLEY SHIRE COUNCIL

PROPOSED ALTERATIONS & ADDITIONS  
BEAUTY POINT BOATRAMP

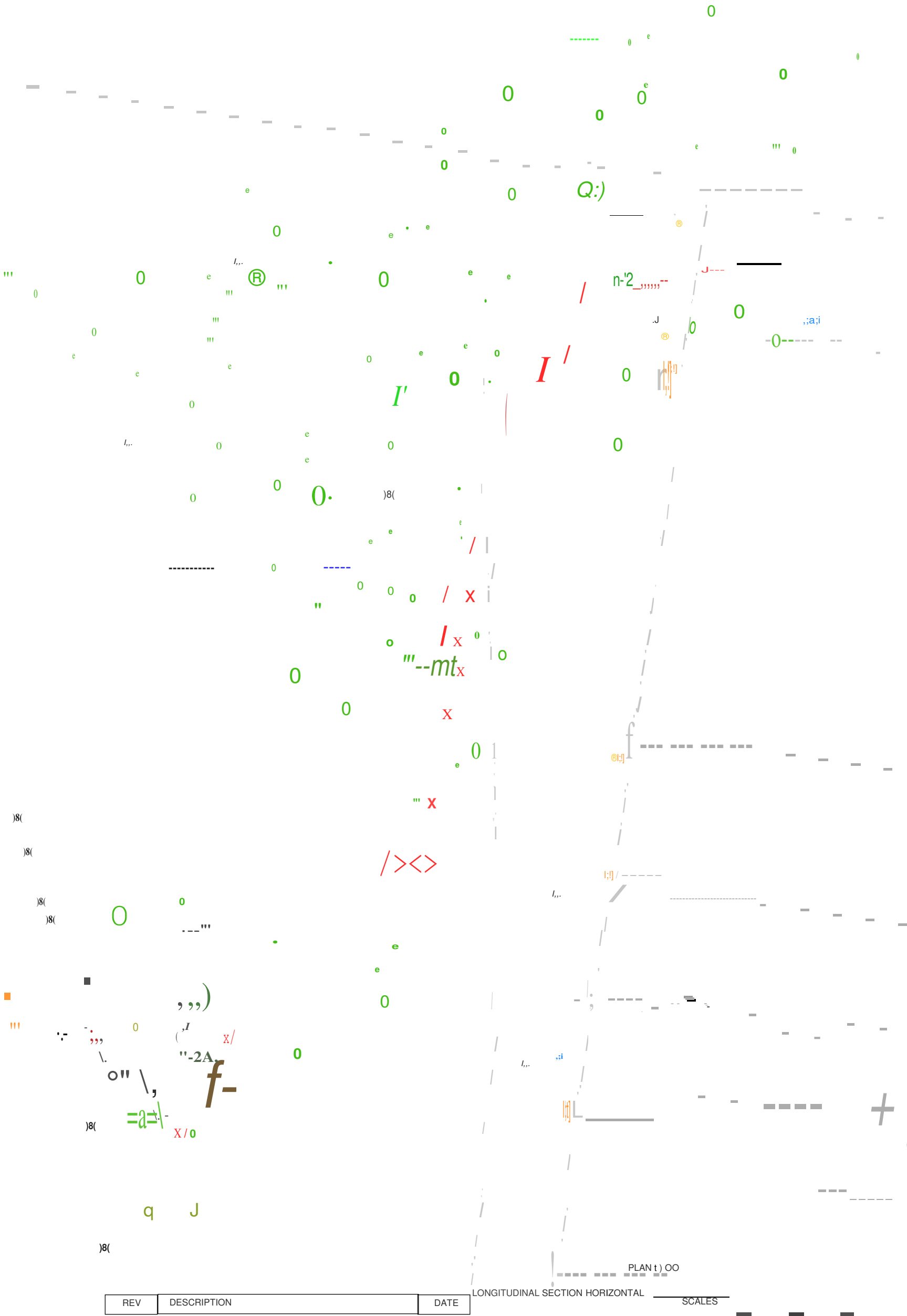
CONCRETE DETAILS

STEVE FITZHENRY B.E

PROJECT NO: 17.05034 PAPER SIZE: A3 SHEET NO: S41 ISSUE: C

## **APPENDIX D. Civil Design Documentation**

# BEAUTY POINT BOAT RAMP EXT ROAD AND LOOP ROAD



## TABLE OF CONTENTS

PAGE 1 - OVERVIEW AND NOTES  
PAGE 2 - DETAILED PLANS  
PAGE 3 - SECTION DETAILS  
PAGE 4 - LONG SECTION OF EXIT LANE AND PARKING LANE  
PAGE 5 - EXIT LANE CROSS SECTIONS  
PAGE 6 - PARKING LANE CROSS SECTIONS CH 0 - CH 80  
PAGE 7 - PARKING LANE CROSS SECTIONS CH 87 - CH 134

## IMPORTANT

IF ANY ABORIGINAL ARTIFACTS OR BONES ARE FOUND, WORK IS TO CEASE IMMEDIATELY AND THE SITE IS TO BE INSPECTED BY AN APPROVED REPRESENTATIVE OF THE LOCAL ABORIGINAL COMMUNITY

## NOTES

- 11 TYPICAL ROAD SECTION IS TO CONSIST OF 200MM PAVEMENT WITH A 2 COAT SEAL
- 21 THE MANEUVERING AREA IDENTIFIED ON PAGE 1 IS TO BE AN ASPHALT CONCRETE SEAL
- 41 THE ASPHALT CONCRETE SEAL IS TO BE 150MM
- 5) THE CONCRETE RIP RAP IS TO CONSIST OF 150MM MIN RANDOMLY PLACED CLEAN ROCK
- 6) THE CONCRETE RIP RAP IS TO MATCH THE PROFILE OF THE CONCRETE V DRAIN THEN GRADUALLY FLATTEN OUT OVER THE LENGTH OF THE RIP RAP TYING INTO THE NATURAL SURFACE
- 7) PARKING IS TO REMAIN INFORMAL ALONG THE PARKING ROAD
- 8) CH 100 OF THE EXIT LANE STARTS TOP OF THE BOAT RAMP
- 9) WATER SERVICE IS TO BE EXTENDED FROM AMENITIES BLOCK FOR A NEW TAP TO BE INSTALLED IN THE BOAT WASH AREA.
- 10) FILL BATTERS ARE NOT TO EXCEED 1:3.
- 11) CUT BATTERS ARE NOT TO EXCEED 1:3.
- 12) NEW WORKS ARE TO TIE INTO EXISTING ROAD LEVELS AT THE INTERSECTIONS
- 13) BOLLARDS ON THE NORTHERN SIDE OF THE MANEUVERING AREA ARE TO BE REMOVED TO MAKE ROOM FOR THE NEW V DRAIN.
- 14) CONCRETE TO HAVE MINIMUM COMPRESSIVE STRENGTH OF 50 MPa AT 28 DAYS.
- 15) BASE UNDERNEATH V DRAIN TO BE WELL COMPACTED GRANULAR BASE, MAX 10mm PARTICLE SIZE.
- 16) VEGETATION REMOVAL WILL BE DONE BY AN APPROPRIATELY QUALIFIED PROFESSIONAL
- 17) WHERE VEGETATION IS REMOVED IT IS TO BE MULCHED AND REUSED ON SITE FOR REVEGETATION PURPOSES, EXCESS MULCH IS TO BE REMOVED FROM SITE

## QUANTITIES

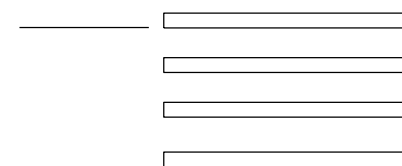
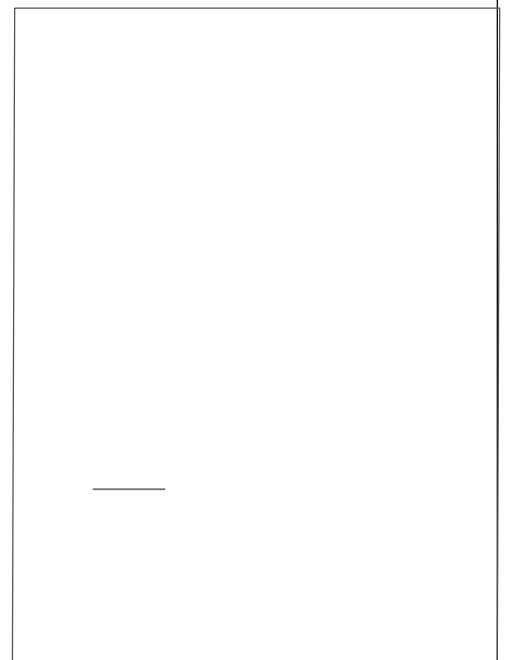
ITEM	QTY
PAVEMENT	~ 320m <sup>3</sup>
40 mm AC SEAL	~ 350m <sup>2</sup>
BITUMEN SEAL	~ 1020m <sup>2</sup>
CUT MATERIAL	~ 240m <sup>3</sup>
CONCRETE V DRAIN	~ 80m
REVEGETATION AREA	~ 230m <sup>2</sup>
PARKING ROAD TREE REMOVAL	4
EXIT ROAD VEGETATION REMOVAL	330m <sup>2</sup>

NOTE: ONLY TREES WITH A TRUNK DIAMETER LARGER THAN 200mm HAVE BEEN IDENTIFIED

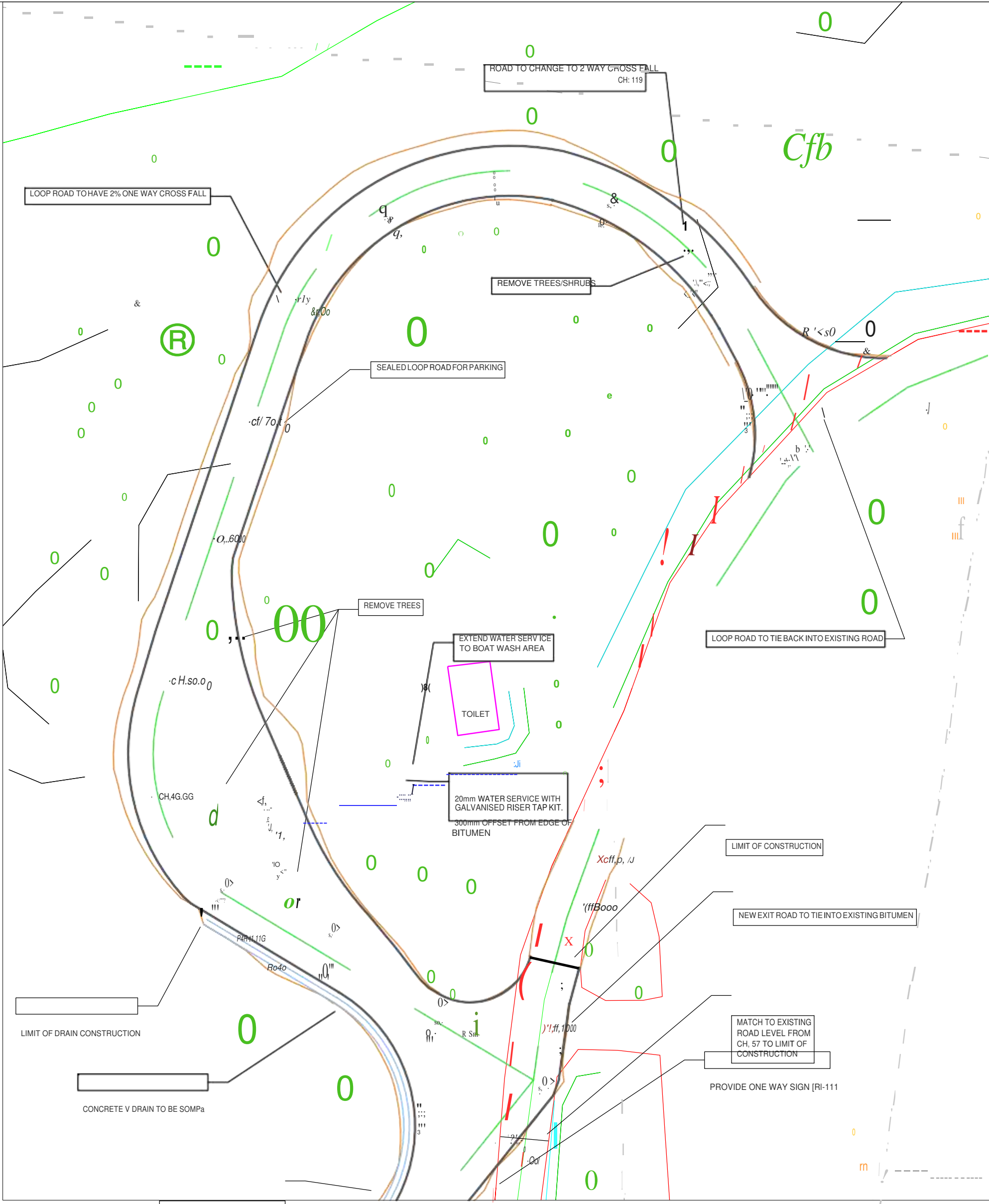
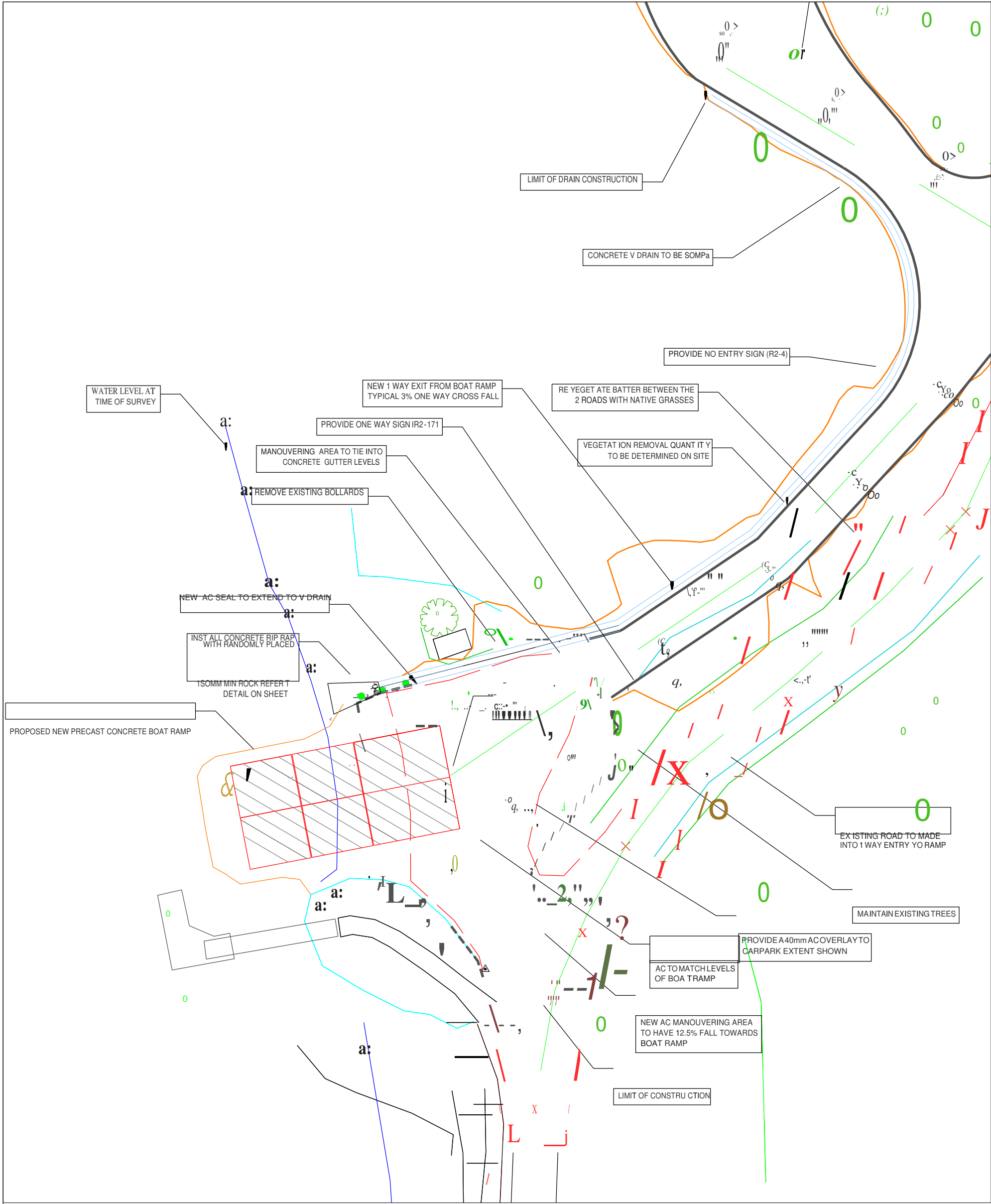
## LEGEND

	PROPERTY BOUNDARY
	WATER SERVICE
	BITUMEN SEAL
	AC SEAL
	TOP OF BANK
	BOTTOM OF BANK
	BATTER
	EDGE OF BITUMEN EXISTING

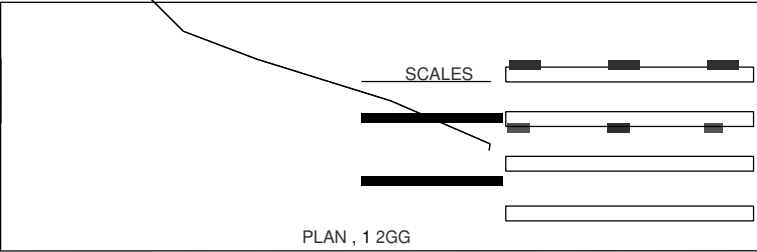
	TELSTRA PIT
	WATER HYDRANT
	DRAWN JS
	DESIGN JS
	SURVEYED GP
	CHECKED
	DATUM







REV	DESCRIPTION	DATE
A	BEAUTY POINT BOAT RAMP ACCESS ROAD	G1/2 G1B



SURVEYED	GP
CHECKED	

DATUM	

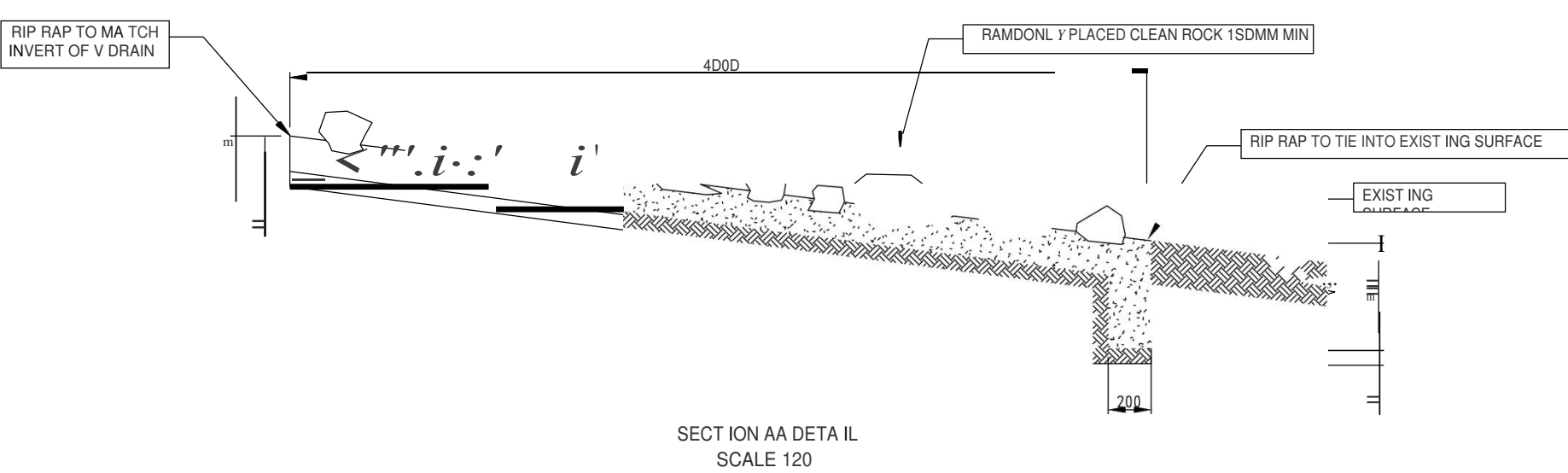
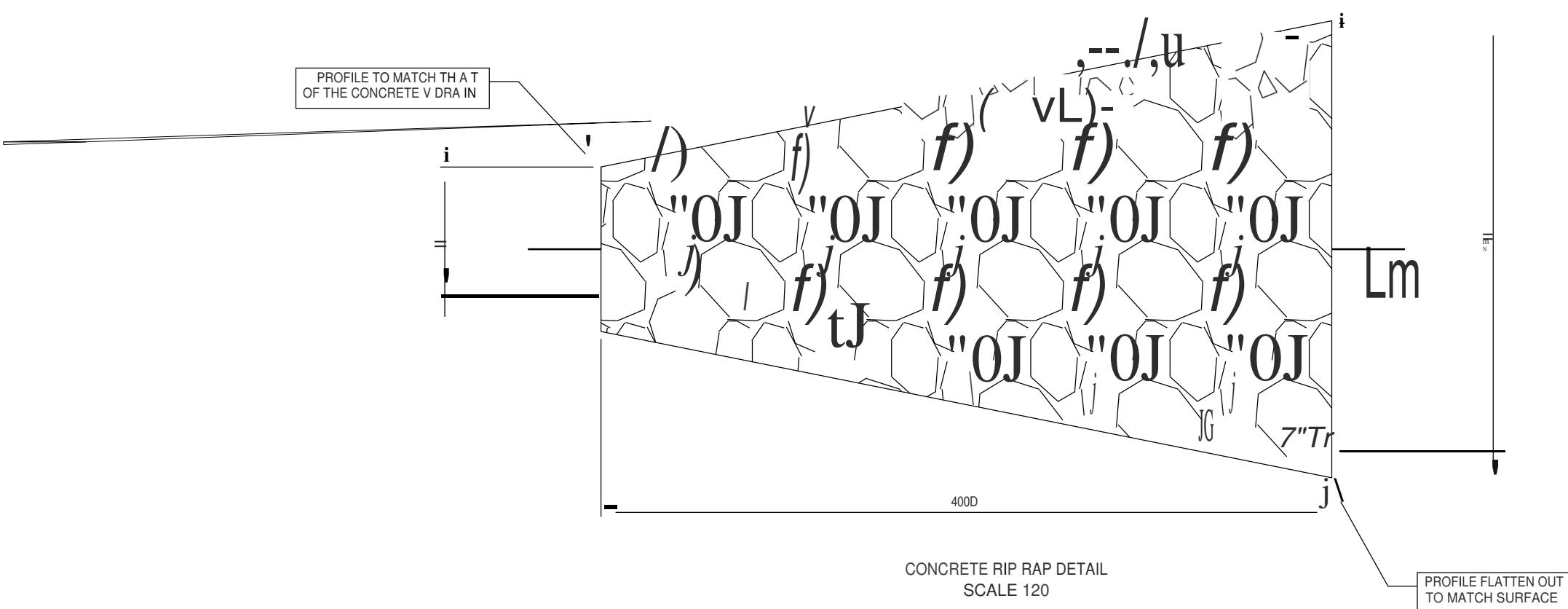
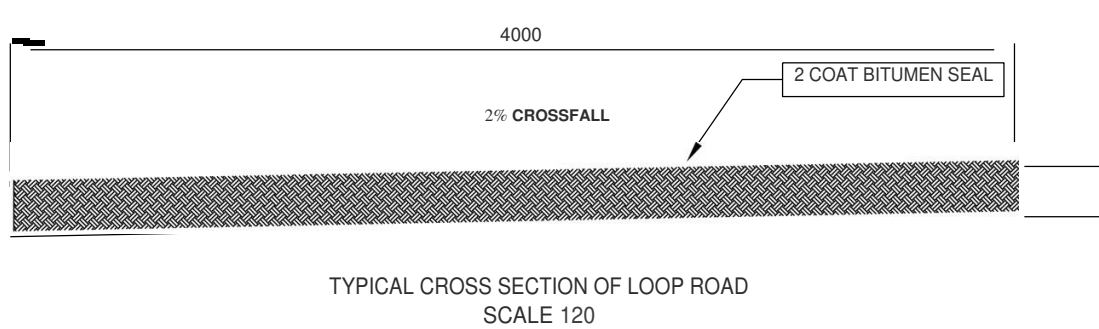
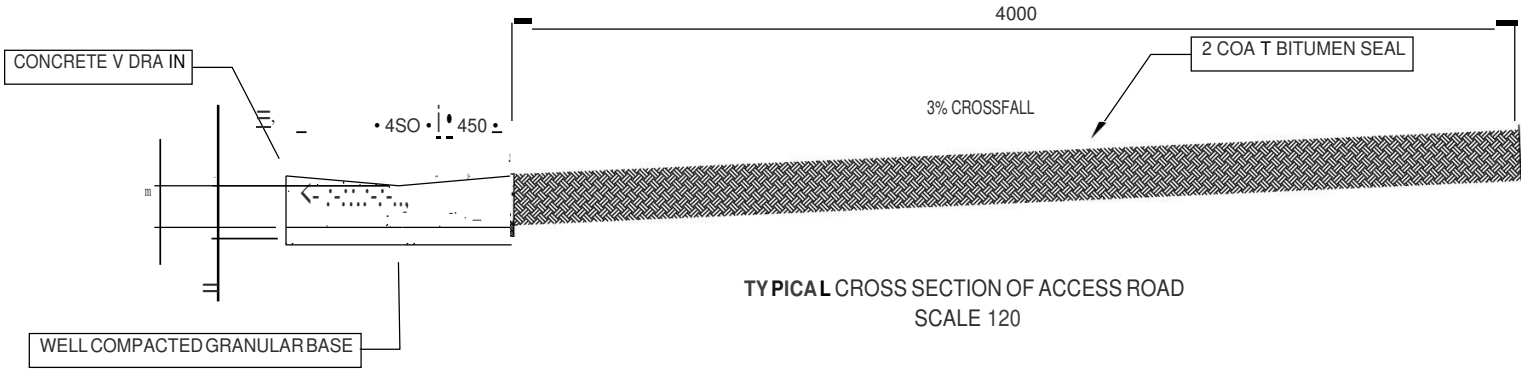


PROJECT				

LONGITUDINAL SECTION HORIZONTAL \_\_\_\_\_  
VERTICAL  
CROSS SECTION

DRAWN JS  
DESIGN SP  
JS  
  
DATE 01/18

BEAUTY POINT  
DESCRIPTION  
BEAUTY POINT BOAT RAMP  
JOB NAME: TUG.PD.2G17.G71 PLAN No. 48BG SHEET No. 2 OF 7 A1



REV	DESCRIPTION	DATE
A	BEAUTY POINT BOAT RAMP ACCESS ROAD	D112D18



SURVEYED	GP	DATUM	AHO
DRAWN	JS	FINAL	
DESIGN	JS		
CHECKED	SB		
DATE	D1/18		



PROJECT			
BEAUTY POINT			
DESCRIPTION			
BEAUTY POINT BOAT RAMP			
JOB NAME: TUG.PD.2D17.D71	PLAN No. 488D	SHEET No. J OF 7	A1













## APPENDIX E. Photographs of Existing Facilities



Figure 1: Existing pontoon and boat ramp



Figure 2: Existing boat ramp and launching area





Figure 3: Existing access road



Figure 4: Existing access road





Figure 5: Existing (informal) parking area



Figure 6: Existing (informal) parking area

## APPENDIX F. Threatened Entities Evaluation

### Threatened Flora

#### ***Presence of habitat:***

**Present:** Potential or known habitat is present within the study area

**Marginal:** Habitat present is not typical but may be suitable

**Absent:** No potential or known habitat is present within the study area

#### ***Likelihood of occurrence***

**Unlikely:** Species known or predicted within the region but no suitable habitat present within the study area, or species known or predicted within the region, habitat may be present in the study area but the proximity of nearest records suggest it is unlikely to occur

**Possible:** Suitable habitat present and the species could occur in the study area based on the proximity of nearest records.

**Present:** Species was recorded during the field investigations

#### ***Potential to be impacted***

**No:** The Proposal will not result in an impact to this species. No Assessment of Significance (AoS) is necessary for this species

**Low:** The Proposal is unlikely to result in an impact to this species. No Assessment of Significance (AoS) is necessary for this species

**Moderate:** The Proposal could impact this species or its habitats. An AoS has been applied to these entities.

**High:** The Proposal is likely to impact this species or its habitats. An AoS has been applied to these entities.

(table adapted from ngenvironmental 2011)

Species	Description of habitat <sup>1</sup>	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Narrabarba Wattle Acacia constablei V BC V EPBC	<p>This species is a South Coast endemic known from only two localities. The largest population is found at Narrabarba Hill south of Eden. The other population is found on a rocky ridgetop 1.4 km to the north on the other side of the Wonboyn River.</p> <p>Confined to rhyolite outcrops with very poor soil development .</p> <p>It is often dominant or co-dominant in an open shrubland community which also includes Giant Honey-myrtle , Tick Bush, Coastal Zieria and Lance-leaf Platysace; the herbaceous component of the vegetation is dominated by Long-leafed Wallaby Grass (Notodanthonia longifolia) and Lepidosperma urophorum.</p> <p>Is assumed to develop a long-lived soil-stored seed bank but no data exist to confirm this.</p> <p>Apparently an obligate seeder - (i.e. it is killed by fire and regenerates then only from seed) .</p>	Absent	Unlikely	No
Bega Wattle Acacia georgensis V BC V EPBC	<p>Only occurs in the far South East of NSW with known sites at Kianinny Bay in Bournda National Park, on Dr George Mountain , Wadbilliga National Park and in Bemboka and Coolangubra Sections (one location on cliffs above the Towamba River) of the South East Forests National Park.</p> <p>Typically occurs on well-drained , shallow soils at sites with considerable exposed rock.</p> <p>The sites where it is found represent a range of different environments with correspondingly varied vegetation ; in general , other tree species are uncommon but can include Veined Olive (Notelaea venosa), Hickory Wattle (Acacia implexa) , Forest Red-gum (Eucalyptus tereticornis) , Woollybutt (E. longifolia), Bega Mallee (E. spectatrix) and Gully Gum (E. smithii).</p> <p>Individuals are evidentially very long-lived , highly drought-tolerant , fire-sensitive trees.</p> <p>Reproduction is exclusively from seed and the plants are not capable of suckering .</p>	Absent	Unlikely	No

<sup>1</sup> Information sourced from species profiles on NSW DECCW's threatened species database or the Australian Government's Species Profiles and Threats database (SPRAT) unless otherwise stated .

DECCW threatened species database: <http://www.threatenedspecies.environment.nsw.gov.au/index.aspx>

SPRAT: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>



Species	Description of habitat <sup>1</sup>	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Merimbula Star-hair Astrotricha sp. Wallagaraugh <b>EI BC</b>	<p>Has a highly restricted and severely fragmented distribution in NSW, occurring in the upper reaches of the Wallagaraugh River about 30 km south-west of Eden (in Yambulla and Timbillica State Forests). The other population is about 50 km to the northeast, a few kilometres north of Merimbula over a three kilometre stretch beside Sapphire Coast Drive, lying partly along one edge of Bournda National Park. Much of this population is concentrated in disturbed roadside habitat. It also occurs in adjacent and relatively undisturbed bushland but at apparently lower frequency. In Victoria, the species is known from occasional records in the catchments of the lower Wallagaraugh River and the upper lake of Mallacoota Inlet, areas which are more or less contiguous with the more southerly of the NSW populations.</p> <p>The southern (Yambulla/Timbillica) population occurs on shallow gravelly granitic soils in fairly dry open forests dominated by rough-barked eucalypts including <i>Eucalyptus cansideniana</i> and <i>E. craaijingalangensis</i>, with a rich shrub layer including some or all of <i>Leptospermum</i> spp., <i>Kunzea ambigua</i>, <i>Dodonaea</i> spp., <i>Hakea</i> spp., <i>Pomaderris</i> spp. and <i>Acacia terminalis</i>.</p> <p>The northern (Bournda) population occurs on deep grey-white sands in rough-barked eucalypt forest (<i>Eucalyptus sieberi</i> and <i>E. globoides</i> dominant) with <i>Banksia serrata</i>, <i>Acacia langifolia</i> and <i>Grevillea mucranulata</i>.</p>	Absent	Unlikely	No
Tessellated/Thick Lip Spider Orchid Caladenia tessellata <b>EI BC</b> <b>V EPBC</b>	<p>The Tessellated Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. The species occurs on the coast in Victoria from east of Melbourne to almost the NSW border.</p> <p>Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.</p> <p>The single leaf regrows each year.</p> <p>Flowers appear between September and November (but apparently generally late September or early October in extant southern populations).</p>	Marginal	Unlikely	No
Chef's Cap Correa Correa baeuerlenii <b>V BC</b> <b>V EPBC</b>	<p>Chef's Cap Correa has been recorded between Nelligen (on Nelligen Creek and the Buckenbowra River) and Mimosa Rocks National Park.</p> <p>Occurs in riparian sites within forests of various eucalypts, including Silvertop Ash (<i>Eucalyptus sieberi</i>), Yellow Stringybark (<i>E. muelleriana</i>), Blue-leafed Stringybark (<i>E. agglomerata</i>) and Spotted Gum (<i>Corymbia maculata</i>) or she-oak woodland. It may also be found in near-coastal rocky sites.</p>	Marginal	Unlikely	No

Species	Description of habitat <sup>1</sup>	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Leafless Tongue Orchid  Cryptostylis hunteriana  V BC  V EPBC	<p>The Leafless Tongue Orchid has been recorded from as far north as Gibraltar Range National Park south into Victoria around the coast as far as Orbost . It is known historically from a number of localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites) . Also recorded at Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park, Ben Boyd National Park.</p> <p>Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland .</p> <p>The larger populations typically occur in woodland dominated by Scribbly Gum (<i>Eucalyptus sclerophylla</i>) , Silvertop Ash (<i>E. sieberi</i>) , Red Bloodwood (<i>Corymbia gummifera</i>) and Black Sheoak (<i>Allocasuarina littoralis</i>) ; appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (<i>C. subulata</i>) and the Tartan Tongue Orchid (<i>C. erecta</i>).</p> <p>In addition to reproducing from seed , it is also capable of vegetative reproduction and thus forms colonies which can become more or less permanent at a site .</p>	Marginal	Unlikely	No
Australian Saltgrass  Distichlis distichophylla  EI BC	<p>This grass is common in Victoria and Tasmania, and extends to South Australia and Western Australia. In Victoria it is found inland as well, but in its limited NSW range it grows only in coastal situations , except for one existing population at Lake Carg ellico. Scattered records are from the areas of Jervis Bay, Ber magui , Wonboyn , Naroo ma, Bodalla and Nadgee Nature Reserve (at Womboyn) .</p> <p>A coloniser of damp saline soils ; found at the edges of salt marshes and on low dunes.</p> <p>Flowers and sets seed in late spring and summer.</p>	Marginal, has been recorded within 10 km (Bionet)	Unlikely	No
Tangled Bedstraw  Galium australe  EI BC	<p>Tangled Bedstraw is widespread in Victoria and is also found in South Australia and Tasmania. Once regarded as presumed extinct in NSW, this species is now known from the Towamba Valley near Bega, Lake Yarrunga near Kangaroo Valley , Cullendulla Creek Nature Reserve near Batemans Bay, Conjola National Park, Swan Lake near Swanhaven , and the Big Hole in Deua National Park. It was recorded historically from the Clyde River near Batemans Bay and the Mongarlowe area near Braidwood. The species also occurs beside Lake Windemere in the Australian Capital Territory at Jervis Bay.</p> <p>Most flowering collections have been made in late spring to early autumn.</p> <p>In NSW Tangled Bedstraw has been found in moist gullies of tall forest, Eucalyptus tereticornis forest, coastal Banksia shrubland , and Allocasuarina nana heathland .</p>	Marginal	Unlikely	No
Square Raspwort  Haloragis exalata subsp. exalata var. exalata  V BC  V EPBC	<p>Square Raspwort occurs in 4 widely scattered localities in eastern NSW. It is disjunctly distributed in the central coast, south coast and north-western slopes botanical subdivisions of NSW.</p> <p>Square Raspwort appears to require protected and shaded damp situations in riparian habitats .</p> <p>Flowering specimens in NSW are recorded from November to January.</p>	Marginal	Unlikely	No

Species	Description of habitat <sup>1</sup>	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Ralston's Leionema  Leionema ralstonii  V BC  V EPBC	<p>Ralston ' s Leionema is endemic to the coastal ranges of south-east NSW between Eden and Pambula.</p> <p>The species is largely confined to dry, rocky habitats. It is most likely to be found in dry shrub communities but can also occur in open forest.</p> <p>While Ralston's Leionema can withstand low intensity fires, infrequently burnt areas appear to provide the most suitable habitat .</p> <p>The species is slow growing, relatively long-lived and possesses an ability to withstand prolonged drought conditions.</p> <p>Recruitment is continuous but individual populations may be expanding or contracting depending on local competition</p>	Absent	Unlikely	No
Yellow Loosestrife  <i>Lysimachia vulgaris</i> <i>var . davurica</i>  EI BC	<p>Yellow Loosestrife is only known from Wingecarribee Swamp, the Boro area near Braidwood and the Bega River Valley . Also found in Victoria and it is also found throughout much of Europe and Asia.</p> <p>The NSW populations are in disparate habitat: extensive wetland on peaty soils , riparian wetland vegetation and pasture on a dairy farm . A rhizomatous or stoloniferous perennial that appears to remain in the vegetative stage for some time prior to blooming; the presence of a flowering specimen apparently indicates it has been in an area for some years.</p>	Absent	Unlikely	No
Tall Knotweed  Persicaria elatior  V BC  V EPBC	<p>Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah , the Upper Avon River catchment north of Rob ertson, Bermagui , and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). The species also occurs in Queensland.</p> <p>This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.</p>	Marginal	Unlikely	No
Bodalla Pomaderris  Pomaderris bodalla  V BC	<p>Bodalla Pomaderris is endemic to NSW and is currently known to occur on the south coast between Bodalla and Merimbula, and in the upper Hunter Valley near Muswellbrook. There are ten populations of Bodalla Pomaderris currently known , and a further two imprecisely described locations from which the species was collected approximately 40 years ago . The majority of populations are small with seven of the populations having estimates of less than a hundred plants each. All populations have locally restricted distributions. The largest known population is in Wollemi National Park and is unlikely to include more than one thousand plants. Bodalla Pomaderris is in the conservation reserves of Kooraban National Park on the south coast, and in Wollemi National Park and Wingen Maid Nature Reserve in the north of its range . Other populations on the south coast are located in State Forests and on private land.</p> <p>On the south coast Pomaderris bodalla occurs in moist open forest along sheltered gullies or along stream banks. In the upper Hunter valley, it occurs in open forest or woodland on open slopes .</p>	Present	Unlikely  (survey would have identified this species if it occurred on site)	No
Parris' Pomaderris  Pomaderris parrisiae  V BC  V EPBC	<p>Parris' Pomaderris has been recorded in Egan Peaks Nature Reserve, Wadbilliga National Park (near Wadbilliga Trig.) and South East Forests National Park (Brown Mountain/ Cochrane Dam area) , with a questionable record in Ben Boyd National Park. Populations once referred to P. parissiae in the upper Kangaroo River catchment above Carrington Falls have been named Pomaderris walshii.</p> <p>Parris' Pomaderris is found on skeletal soils in rocky shrubland or tall open forest chiefly on escarpment ranges.</p>	Absent	Unlikely	<b>No</b>

Species	Description of habitat <sup>1</sup>	Presence of habitat	Likelihood of occurrence	Assessment of significance required
<p>Oval-leaved Pseudanthus</p> <p>Pseudanthus ovalifolius</p> <p>El BC</p>	<p>Recorded in the Torrington area on the New England Tablelands and in Ben Boyd National Park. There have been no southern records since 1978. It is also found in scattered localities from central western Victoria to Gippsland and in Tasmania. The Tasmanian populations may be a separate species .</p> <p>In the south the species is found in near coastal dry sclerophyll forest growing in sandy soil. Flowering occurs in September and October .</p> <p>In the north , Pseudanthus ovalifolius grows in rocky outcrop areas on granite and flowers during summer.</p>	Absent	Unlikely	No
<p>Matted Bush-pea</p> <p>Pultenaea pedunculata</p> <p>El BC</p>	<p>Matted Bush-pea is widespread in Victoria , Tasmania, and south-eastern South Australia. In NSW however , it is represented by just three disjunct populations, in the Cumberland Plains in Sydney , the coast between Tathra and Bermagui and the Windellama area south of Goulburn (where it is locally abundant) .</p> <p>The Matted Bush-pea occurs in a range of habitats . NSW populations are generally among woodland vegetation but plants have also been found on road batters and coastal cliffs. It is largely confined to loamy soils in dry gullies in populations in the Windellama area.</p> <p>The ability of stems to creep and root from the nodes has made this species a very good coloniser of bare ground in many parts of its range .</p> <p>Flowers appear in spring .</p>	Marginal	Unlikely	No
<p>Coast Groundsel</p> <p>Senecio spathulatus</p> <p>El BC</p>	<p>Coast Groundsel occurs in Nadgee Nature Reserve (Cape Howe) and between Kurnell in Sydney and Myall Lakes National Park (with a possible occurrence at Cud mirrah) . In Victoria there are scattered populations from Wilsons Promontory to the NSW border. Coast Groundsel grows on primary dunes</p>	Absent	Unlikely	No
<p>Austral Toadflax</p> <p>Thesium australe</p> <p>V BC</p> <p>V EPBC</p>	<p>Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast , and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia .</p> <p>Occurs in grassland or grassy woodland .</p> <p>Often found in damp sites in association with Kangaroo Grass (Themeda australis) .</p> <p>A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass .</p>	Absent	Unlikely	No
<p>Hidden Violet</p> <p>Viola cleistogamoides</p> <p>El BC</p>	<p>Hidden Violet is locally common in parts of coastal Victoria , Tasmania and South Australia . In NSW it is known from a collection at Wonboyn in 1954 and a recent sighting in Nadgee Nature Reserve.</p> <p>At Nadgee Moor the Hidden Violet occurs in heath .</p> <p>Elsewhere it occupies a variety of situations , often in wet sandy coastal heaths .</p> <p>Hidden Violets have also been found inland in heathland , woodland with a heathy understorey and grassy forests. Disturbed sites such as tracks , firebreaks and even lawns have also been colonised.</p>	Marginal	Unlikely	No

Species	Description of habitat <sup>1</sup>	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Narrow-leafed Wilsonia  Wilsonia backhousei  V BC	In NSW Narrow-leaf Wilsonia is found on the coast between Mimosa Rocks National Park and Wamberal north of Sydney (Nelson's Lake, Potato Point, Sussex Inlet, Wowly Gully, Parramatta River at Ermington, Clovelly, Voyager Point, Wollongong and Royal National Park). It grows in all southern states.  This is a species of the margins of salt marshes and lakes.	Marginal	Unlikely	No
Round-leafed Wilsonia  Wilsonia rotundifolia  EI BC	May be a clonal species so that what appear to be large populations at some sites may actually be composed of only limited numbers of generically distinct individuals which are the result of vegetative (asexual) reproduction.  Grows in mud in coastal saltmarsh and inland saline or brackish lake beds.  In undisturbed habitat, it can be a good coloniser as the creeping stems root from the nodes.	Absent	Unlikely	No
Shapely Zieria  Zieria formosa  E4A BC  E EPBC	This species is known from a single population at Lochiel, 6 km south-west of Pambula on the far south coast of NSW.  This species occurs on the north-easterly aspect of an upper, moderately steep slope of a breakaway area above a small valley. The soil is a skeletal, grey, sandy loam. The site is strewn with broken ignimbrite rocks and boulders and there is much exposed surface rock (Briggs & Leigh 1990; NSW NPWS 2002f; Armstrong 2002).  The vegetation is a shrub-dominated heath community that includes Acacia mearnsii, Commersonia fraseri, Dodonaea triquetra, Prostanthera nivea, Pittosporum undulatum, Kunzea ambigua, Leptospermum flavescens, Stypanthera glauca, Plectranthus parviflorus, Dendrobium speciosum, Cheilanthes tenuifolia, Platysace lanceolata and Hymenanthera dentata (Briggs & Leigh 1990; NSW NPWS 2002f; Armstrong 2002; Harden 2002).	Absent	Unlikely	No

## Threatened and Migratory Fauna

The table below presents the habitat evaluation for threatened fauna (Biodiversity Conservation Act 2016 and Environment Protection and Biodiversity Conservation Act 1999) for a 10x10km bionet records search and the South East Coastal Plains subregion of the Southern Rivers Catchment Management Area (BC Act) and a 1km radius from subject site (EPBC Act). Pelagic/marine species (eg albatross and whales) have been removed from the assessment as they will not be impacted by the proposal. Presence of habitat has been determined using survey data and published habitat preferences for the species (for example the DECCW species habitat profiles). The likelihood of occurrence is based on presence of habitat onsite and local records.

### Records within 10 km:

NSW Bionet records for the species exist within a 10 x 10km square centred on the site

### Presence of Habitat:

Present:	Potential or known foraging, roosting, nesting, refuge, or other habitat is present on site.
Marginal	Some habitat elements exist on site however these are sub optimal for the species
Absent:	No potential foraging, roosting, nesting or other habitat is present onsite

### Likelihood of Occurrence

Unlikely:	Species is not likely to occur
Vagrant:	Species could occur on occasion as a vagrant or passing over/across the study area (usually applies to more mobile species)
Possible:	Species could occur and utilise resources on site
Present:	Species recorded onsite or records exist within the locality and habitat is present

### Assessment of significance required

No:	The Proposal would not impact this species or its habitat. No further assessment considered to be required
Yes:	Assessment of Significance completed for this species

(table adapted from nghenvironmental 2011)



Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
<b>Amphibians</b>					
Giant Burrowing Frog <i>Heleioporus australiacus</i> V BC V EPBC	The Giant Burrowing Frog is distributed in south eastern NSW and Victoria. Breeding habitat of this species is generally soaks or pools within first or second order stream. They are also commonly recorded from 'hanging swamp' seepage lines and where small pools form from the collected water. Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.		Marginal	Unlikely	No
Stuttering Frog <i>Mixophyes ba/bus</i> EI BC V EPBC	Stuttering Barred Frogs occur along the east coast of Australia from southern Queensland to north-eastern Victoria. It is the only <i>Mixophyes</i> species that occurs in south-east NSW and in recent surveys it has only been recorded at three locations south of Sydney. The Darrigo region, in north-east NSW, appears to be a stronghold for this species. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor.		Absent	Unlikely	No
Green and Golden Bell Frog <i>Litoria aurea</i> EI BC V EPBC	Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands.  Inhabits marshes, dams and stream-sides, particularly those containing bullrushes ( <i>Typha</i> spp.) or spikerushes ( <i>Eleocharis</i> spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow ( <i>Gambusia holbrooki</i> ), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.	Yes	Absent	Unlikely	No
<b>Birds</b>					
Australasian Bittern <i>Botaurus poiciloptilus</i> EI BC	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes ( <i>Typha</i> spp.) and spikerushes ( <i>Eleocharis</i> spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains. Breeding occurs in summer from October to January; nests are built in	Yes	Absent	Unlikely	No

<sup>2</sup> Information sourced from species profiles on NSW DECCW's threatened species database or the Australian Government's *Species Profiles and Threats* database (SPRAT) unless otherwise stated.

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch.					
Australian Painted Snipe <i>Rostratula australis</i> V EPBC M EPBC	<p>he Australian Painted Snipe has been recorded at wetlands in all states of Australia (Barrett et al. 2003; Blakers et al. 1984; Hall 1910b). It is most common in eastern Australia , where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia . The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands , including temporary and permanent lakes , swamps and claypans. They also use inundated or waterlogged grassland or salt marsh , dams, rice crops , sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges , rushes or reeds, or samphire; often with scattered clumps of lignum <i>Muehlenbeckia</i> or canegrass or sometimes tea-tree (<i>Melaleuca</i> ). The Australian Painted Snipe sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (Marchant &amp; Higgins 1993) .</p>		Absent	Unlikely	No
Barking Owl <i>Ninox connivens</i> V BC	<p>The Barking Owl is found throughout continental Australia except for the central arid regions. Although common in parts of northern Australia , the species has declined greatly in southern Australia and now occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains (especially the Pilliga) and in some northeast coastal and escarpment forests. Many populations have crashed as woodland on fertile soils was cleared, leaving linear riparian strips of remnant trees as the last inhabitable areas . Sometimes extend their home range into urban areas , hunting birds in garden trees and insects attracted to streetlights .</p> <p>Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland . 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 on these fertile soils .</p> <p>Roost in shaded portions of tree canopies , including tall midstorey trees with dense foliage such as <i>Acacia</i> and <i>Casuarina</i> species . During nesting season , the male perches in a nearby tree overlooking the hollow entrance .</p> <p>Requires very large permanent territories in most habitats due to sparse prey densities . Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats .</p>		Present	Vagrant	No
Bar-tailed Godwit <i>Limosa lapponica</i> M EPBC	<p>The Bar-tailed Godwit breeds in the north of Scandinavia, Russia and north-west Alaska. During the non-breeding season seven important sites have been identified in Australia. In NSW this is the Hunter Estuary. Habitat includes large intertidal sandflats, banks, mudflats , estuaries, inlets , harbours , coastal lagoons and bays . It is found often around beds of seagrass and , sometimes, in nearby salt marsh . It has been sighted in coastal sewage farms and salt works, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock plat for ms, and coral reef-flats . It is rarely found on inland wetlands or in areas of short grass.</p>		Absent	Unlikely	No
Black Bittern <i>Ixobrychus flavicollis</i> V BC	<p>The Black Bittern has a wide distribution , from southern NSW north to Cape York and along the north coast to the Kimberley region. The species also occurs in the south-west of Western Australia . In NSW, records of the species are scattered along the east coast , with individuals rarely being recorded south of Sydney or inland .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 .Feeds on frogs, reptiles , fish and invertebrates, including snails, dragonflies , shrimps and crayfish, with most feeding done at dusk and at night.During the day, roosts in trees or on the ground amongst dense reeds . When disturbed, freezes in a characteristic bittern posture (stretched tall, bill pointing up, so that shape and streaked pattern blend with upright stems of reeds), or will fly up to a branch or flush for cover where it will freeze again . Generally solitary , but occurs in pairs during the breeding season , from December to March .</p>		Absent	Unlikely	No

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Black-faced Monarch <i>Monarcha melanopsis</i> M EPBC	The Black-faced Monarch is found along the coast of eastern Australia, becoming less common further south . The Black-faced Monarch is found in rainforests , eucalypt woodlands , coastal scrub and damp gullies. It may be found in more open woodland when migrating . Resident in the north of its range , but is a summer breeding migrant to coastal south-eastern Australia , arriving in September and returning northwards in March . It may also migrate to Papua New Guinea in autumn and winter		Present	Vagrant	No  Extent of the proposed action would have no impact on this species
Brown Treecreeper <i>Climacteris picumnus</i> V BC	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range . It is less commonly found on coastal plains and ranges.  The eastern subspecies lives in eastern NSW in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands such as the Snowy River Valley , Cumberland Plains , Hunter Valley and parts of the Richmond and Clarence Valleys .  The population density of this subspecies has been greatly reduced over much of its range , with major declines recorded in central NSW and the northern and southern tablelands. Declines have occurred in remnant vegetation fragments smaller than 300 hectares, that have been isolated or fragmented for more than 50 years.  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 ( <i>Eucalyptus camaldulensis</i> ) Forest bordering wetlands with an open understorey of acacias , saltbush , lignu m, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded , though less commonly, in similar woodland habitats on the coastal ranges and plains.  Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year- round , though some birds may disperse locally after breeding.		Absent	Unlikely	No
Bush Stone-curlew <i>Burhinus gral/arius</i> E BC	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber . Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates , such as frogs, lizards and snakes .	yes	Marginal	Unlikely	No
Cattle Egret <i>Ardea ibis</i> M EPBC	The Cattle Egret is widespread and common according to migration movements and breeding localities surveys . Two major distributions have been located; from north-east Western Australia to the Top End of the Northern Territory and around south-east Australia. In Western Australia and the Northern Territory, the Cattle Egret is located from Wyndham to Arnhem Land . In south-east Australia it is found from Bunda berg, inland to Ro ma, Thargominda, and then down through Inverell, Walgett , Nyngan, Cobar , Ivanhoe , Balranald to Swan Hill , and then west to Pinnaroo and Port Augusta (Marchant & Higgins 1990)		Marginal	Vagrant	No  Extent of the proposed action would have no impact on this species
Comb-Crested Jacana	Occurs throughout coastal Australia and well inland in the north from the Kimberley to Sydney . Vagrants occasionally appear further south , possibly in response to unfavourable conditions further north in NSW. Inhabits permanent wetlands with a good		Absent	Unlikely	No

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
<i>Irediparra gallinacea</i> VBC	surface cover of floating vegetation , especially water-lilies				
Diamond Firetail <i>Stagonop/aura guttata</i> V BC	The Diamond Firetail is endemic to south-eastern Australia , extending from central Queensland to the Eyre Peninsula in South Australia . It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina . Not commonly found in coastal districts, though there are records from near Sydney , the Hunter Valley and the Bega Valley . This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River. Usually encountered in flocks of between five to 40 birds, occasionally more. Found in grassy eucalypt woodlands , including Box-Gum Woodlands and Snow Gum <i>Eucalyptus pauciflora</i> Woodlands . Often found in riparian areas (rivers and creeks) , and sometimes in lightly wooded farmland . Groups separate into small colonies to breed, between August and January. Nests are globular structures built either in the shrubby understorey , or higher up, especially under hawk's or raven's nests. Appears to be sedentary , though some populations move locally, especially those in the south .		Absent	Unlikely	vNo
Eastern Bristlebird <i>Dasyornis brachypterus</i> EI BC E EPBC	The distribution of the Eastern Bristlebird has contracted to three disjunct areas of south-eastern Australia : southern Queensland/northern NSW, the Illawarra Region and in the vicinity of the NSW/Victorian border . The southern population in Nadgee Nature Reserve and Howe's Flat is around 200 birds. Further surveys are required in parts of Ben Boyd National Park and Sydney Catchment Authority lands to determine whether further populations of the Eastern Bristlebird occur in these areas. Habitat is characterised by dense, low vegetation including heath and open woodland with a heathy understorey ; in northern NSW occurs in open forest with tussocky grass understorey ; all of these vegetation types are fire prone.		Absent	Unlikely	No
Eastern Curlew <i>Numenius madagascariensis</i> M EPBC	The Eastern Curlew is most commonly associated with sheltered coasts , especially estuaries, bays , harbours , inlets and coastal lagoons, with large intertidal mudflats or sand flats, often with beds of seagrass . Occasionally , the species occurs on ocean beaches (often near estuaries), and coral reefs, rock plat for ms, or rocky islets.		Present	Possible	No
Eastern Ground Parrot <i>Pezoporus wallicus wallicus</i> V BC	The eastern subspecies ( <i>wallicus</i> ) inhabits south-eastern Australia from southern Queensland through NSW to western Victoria . It formerly occurred in South Australia , but was last recorded in 1945. In NSW populations have declined and contracted to islands of coastal or subcoastal heathland and sedgeland habitats. The largest populations occur on the NSW south coast, particularly Barren Grounds NR, Budderoo NP, the Jervis Bay area and Nadgee NR. Small numbers are recorded at Morton and Ben Boyd NP and other areas on the south coast. Estimated population size is about 2000 birds. The Ground Parrot occurs in high rainfall coastal and near coastal low heathlands and sedgelands , generally below one metre in height and very dense (up to 90% projected foliage cover). These habitats provide a high abundance and diversity of food, adequate cover and suitable roosting and nesting opportunities for the Ground Parrot , which spends most of its time on or near the ground. When flushed, birds fly strongly and rapidly for up to several hundred metres, at a metre or less above the ground. Home ranges of adult birds is typically 10 ha and overlapping with other birds, while juveniles have a significantly larger home range. There is no evidence of regular long-distance dispersal or migration events.		Absent	Unlikely	No
Flame Robin <i>Petroica phoenicea</i>	Ranges from Queensland border to SE South Australia and Tasmania. In NSW, it breeds in upland tall moist eucalypt forests and woodlands , often on ridges and slopes, and in winter, many birds move to drier more open habitats on the inland slopes and plains. Prefers clearings or areas with open understoreys, with a groundlayer dominated by native grasses. In winter lives in dry		Marginal	Unlikely	No Extent of the proposed

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
V BC	forests, open woodlands and in pastures and native grasslands , with or without scattered trees. Forms mixed species flocks in the non-breeding season .				action would have no impact on this species
Fork-tailed Swift <i>Apus pacificus</i> M EPBC	The Fork-tailed Swift is a non-breeding visitor to all states and territories of Australia . The Fork-tailed Swift is almost exclusively aerial , flying from less than 1 m to at least 300 m above ground and probably much higher .		Present	Vagrant	No  Extent of the proposed action would have no impact on this species
Gang-gang Cockatoo <i>Calocephalon fimbriatum</i> V BC	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes . It occurs regularly in the Australian Capital Territory . It is rare at the extremities of its range , with isolated records known from as far north as Coffs Harbour and as far west as Mudgee . In summer, generally found in 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 . May also occur in sub-alpine Snow Gum <i>Eucalyptus pauciflora</i> woodland and occasionally in temperate rainforests. Move to lower altitudes in winter, 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.		Present	Present	Extent of the proposed action would have no impact on this species
Glossy Black-Cockatoo <i>Calyptorhynchus Jathami</i> V BC	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria , and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina . An isolated population exists on Kangaroo Island, South Australia . Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species , particularly Black She-oak ( <i>Allacasuarina littoralis</i> ), Forest She-oak ( <i>A. tarulasa</i> ) or Drooping She-oak ( <i>A. verticillata</i> ) occur. In the Riverina area , again usually associated with woodlands containing Drooping She-oak but also recorded in open woodlands dominated by Belah ( <i>Casuarina cristata</i> ).  Feeds almost exclusively on the seeds of several species of she-oak ( <i>Casuarina</i> and <i>Allacasuarina</i> species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites . One or two eggs are laid between March and August .		Present  (no feed trees present)	Present	No  Extent of the proposed action would have no impact on this species
Great/White Egret <i>Ardea alba</i> M EPBC	Eastern Great Egrets are widespread in Australia . They occur in all states/territories of mainland Australia and in Tasmania. They have also been recorded as vagrants on Lord Howe , Norfolk and Macquarie Islands (Barrett et al. 2003; Blakers et al. 1984; Hermes et al. 1986; Marchant & Higgins 1990; McKilligan 2005).  The Eastern Great Egret has been reported in a wide range of wetland habitats (for example inland and coastal, freshwater and saline , permanent and ephemeral, open and vegetated , large and small , natural and artificial) . These include swamps and marshes ; margins of rivers and lakes; damp or flooded grasslands , pastures or agricultural lands ; reservoirs ; sewage treatment ponds; drainage channels ; salt pans and salt lakes; salt marshes ; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs (Kushlan & Hancock 2005; Marchant & Higgins 1990; Martfnez-Vilalta & Matis 1992). The species usually frequents shallow waters .  The Eastern Great Egret may retreat to permanent wetlands or coastal areas when other wetlands are dry (for example , during		Marginal	Vagrant	No  Extent of the proposed action would have no impact on this species

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
	drought). This may occur annually in some regions with regular wet and dry seasons or erratically where the availability of wetland habitat is also erratic.				
Hooded Plover <i>Thinornis rubricollis</i> E BC	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.		Marginal	Vagrant	No  Extent of the proposed action would have no impact on this species
Hooded Robin <i>Melanodryas cucul/ata</i> V BC	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form (subspecies <i>cucullata</i> is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies <i>picata</i> . Two other subspecies occur outside NSW. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas . Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.		Absent	Unlikely	No
Latham's Snipe <i>Gallinago hardwickii</i> M EPBC	This species arrives in Australia in July-August, from Japan, where it breeds. It frequents freshwater and saline wherever, soft, wet ground, or shallow water with tussocks and other green growth is present . It is usually flushed from areas of dense ground vegetation .		Marginal	Vagrant	No
Little Eagle <i>Hieraaetus morphnoides</i> V BC	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW.  Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living rees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion .		Present	Vagrant	No  Extent of the proposed action would not impact this species
Little Lorikeet <i>Glossopsitta pusill/a</i> V BC	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, with lorikeets found westward as far as Dubbo and Albury . Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs.  Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species . Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity . Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species . Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards Gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries . Roosts in treetops, often distant from feeding areas .		Present	Vagrant	No  Extent of the proposed action would not impact this species

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Little Tern <i>Sterna a/bifrons</i> E BC M EPBC	This species is a summer breeding migrant to coastal mainland Australia . It nests and forages in small colonies in low dunes or sandy beaches, occasionally seen foraging along inlets or harbours		Marginal	Vagrant	No  Extent of the proposed action would not impact this species
Masked Owl <i>Tyto novaehol/andiae</i> V BC	Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution . Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting . Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides . The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares.		Present	Possible	No  Extent of the proposed action would not impact this species
Olive Whistler <i>Pachycephala olivacea</i> V BC	The Olive Whistler inhabits the wet forests on the ranges of the east coast. It has a disjunct distribution in NSW chiefly occupying the beech forests around Barrington Tops and the MacPherson Ranges in the north and wet forests from Illawarra south to Victoria. In the south it is found inland to the Snowy Mountains and the Brindabella Range . Mostly inhabit wet forests above about 500m. During the winter months they may move to lower altitudes . Forage in trees and shrubs and on the ground, feeding on berries and insects. Make nests of twigs and grass in low forks of shrubs . Lay two or three eggs between September and January		Absent	Unlikely	No
Orange-bellied Parrot <i>Neophema chrysogaster</i> CE EPBC M EPBC	<p>The Orange-bellied Parrot breeds in the south-west of Tasmania and migrates in autumn to spend the winter on the mainland coast of south-eastern South Australia and southern Victoria . There are occasional reports from NSW, with the most recent records from Shellharbour and Maroubra in May 2003. It is expected that NSW habitats may be being more frequently utilised than observations suggest . Typical winter habitat is saltmarsh and strandline/foredune vegetation communities either on coastlines or coastal lagoons. Spits and islands are favoured but they will turn up anywhere within these coastal regions. The species can be found foraging in weedy areas associated with these coastal habitats or even in totally modified landscapes such as pastures , seed crops and golf courses.</p> <p>On the mainland, the Orange-bellied Parrot spends winter mostly within 3 km of the coast in sheltered coastal habitats including bays, lagoons, estuaries, coastal dunes and saltmarshes . The species also inhabits small islands and peninsulas and occasionally saltworks and golf courses. Birds forage in low samphire herbland or taller coastal shrubland</p>		Absent	Unlikely	No
Osprey <i>Pandion haliaetus</i> V BC	<p>Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines , islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. There are a handful of records from inland areas .</p> <p>Favour coastal areas , especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.</p> <p>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.. Incubation of 2-3 eggs, usually by the female, is about 40 days. Female remains with young almost until they fly, usually after about nine weeks in the nest.</p>		Present	Possible	No  Extent of the proposed action would not impact this species
Pied Oystercatcher <i>Haematopus Jongirostris</i>	This species is found in association with beaches and bays and also forages in estuaries and mudflats . Occasionally on rocky reefs and shores (Pizzey & Knight 2003).		Present	likely	No  Extent of the proposed



BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
V BC					action would not impact this species
Pink Robin <i>Petroica rodinogaster</i> V BC	<p>The Pink Robin is found in Tasmania and the uplands of eastern Victoria and far south-eastern NSW, almost as far north as Bombala . On the mainland , the species disperses north and west and into more open habitats in winter, regularly as far north as the ACT area , and sometimes being found as far north as the central coast of NSW.</p> <p>Inhabits rainforest and tall, open eucalypt forest , particularly in densely vegetated gullies.</p>		Present	Vagrant	No  Extent of the proposed action would not impact this species
Powerful Owl <i>Ninox strenua</i> V BC	<p>The Powerful Owl is endemic to eastern and south-eastern Australia , mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria . In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered , mostly historical records on the western slopes and plains. Now uncommon throughout its range where it occurs at low densities .</p> <p>The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest .</p> <p>The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine Syncarpia glomulifera , Black She-oak Allocasuarina littoralis , Blackwood Acacia melanoxylon, Rough-barked Apple Angorophora floribunda , Cherry Ballart Exocarpus cupressiformis and a number of eucalypt species .</p>		Present	Vagrant	No  Extent of the proposed action would not impact this species
Purple-crowned Lorikeet <i>G/ossopsitta porphyrocephala</i> V BC	<p>Nomadic. Commonly seen in the Grey Box and White Box woodlands in the Riverina region , and occasionally along the Murray Valley . Occasional sightings in box-ironbark habitats across the south-west slopes of NSW. The species is nomadic, with the pattern of distribution varying from year to year according to flowering conditions.</p>		Marginal	Unlikely	No
Rainbow Bee-eater <i>Merops ornatus</i> M EPBC	<p>The Rainbow Bee-eater is distributed across much of mainland Australia</p> <p>The Rainbow Bee-eater occurs mainly in open forests and woodlands , shrublands , and in various cleared or semi-cleared habitats, including farmland and areas of human habitation (Higgins 1999). It usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water (Badman 1979; Boekel 1976; Fry 1984; Roberts 1979; Storr 1984a, 1984b, 1985a). It also occurs in inland and coastal sand dune systems, and in mangroves in northern Australia , and has been recorded in various other habitat types including heathland , sedgeland , vine forest and vine thicket, and on beaches (Higgins 1999).</p>		Present	Vagrant	No  Extent of the proposed action would not impact this species
Regent Honeyeater <i>Anthochaera Phrygia</i> E4A BC	<p>The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia . Birds are also found in drier coastal woodlands and forests in some years.</p> <p>Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast . Birds are occasionally seen on the south coast.</p>	yes	Present	Vagrant	No  Extent of the proposed action would not

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
E EPBC M EPBC	The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes . Key eucalypt species include Mugga Ironbark , Yellow Box, Blakely 's Red Gum, White Box and Swamp Mahogany . Also utilises : E. microcarpa , E. punctata , E. polyanthemos , E. mollucana, Corymbia robusta , E. crebra , E. caleyi , Corymbia maculata , E. mckieana , E. macrorhyncha , E. laevopinea , and Angophora floribunda . Nectar and fruit from the mistletoes A. miquelii, A. pendula, A. cambagei are also eaten during the breeding season .				impact this species
Rufous Fantail <i>Rhipidura rufifrons</i> M EPBC	The Rufous Fantail is found in rainforest , dense wet forests, swamp woodlands and mangroves , preferring deep shade , and is often seen close to the ground . During migration , it may be found in more open habitats or urban areas . Strongly migratory in the south of its range, it moves northwards in winter, and virtually disappears from Victoria and New South Wales at this time.		Present	Vagrant	No  Extent of the proposed action would not impact this species
Sanderling <i>Calidris alba</i> V BC M EPBC	This species breeds in the northern hemisphere . It inhabits coastal areas on low beaches , near reefs, inlets , mudflats and lagoons (Pizzey & Knight 2003). They forage for invertebrates .		Marginal	Vagrant	No  Extent of the proposed action would not impact this species
Satin Flycatcher <i>Myiagra cyano/euca</i> M EPBC	The Satin Flycatcher is widespread in eastern Australia and vagrant to New Zealand (Blakers et al. 1984; Coates 1990a) .  Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands , and on migration , occur in coastal forests, woodlands , mangroves and drier woodlands and open forests (Blakers et al. 1984; Emison et al. 1987; Officer 1969).		Present	Vagrant	No  Extent of the proposed action would not impact this species
Scarlet Robin <i>Petroica boodang</i> V BC	The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia . In NSW, it occurs from the coast to the inland slopes . After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes . Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. The Scarlet Robin lives in dry eucalypt forests and woodlands . The understorey is usually open and grassy with few scattered shrubs . This species lives in both mature and regrowth vegetation . It occasionally occurs in mallee or wet forest communities , or in wetlands and tea-tree swamps.  Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes , the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude . The Scarlet Robin is primarily a resident in forests and woodlands , but some adults and young birds disperse to more open habitats after breeding.		Marginal	Unlikely	No
Sooty Owl <i>Tyto tenebricosa</i> V BC	Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. There is no seasonal variation in its distribution . Occurs in rain forest , including dry rainforest , subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosts by day in the hollow of a tall forest tree or in heavy vegetation; hunts by night for small ground mammals or tree-dwelling mammals such as the Common Ringtail Possum ( <i>Pseudocheirus peregrinus</i> ) or Sugar Glider ( <i>Petourus breviceps</i> ). Nests in very large tree-hollows .		Present	Unlikely	No  Extent of the proposed action would not impact this species

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Sooty Oyster-catcher <i>Haematopus fuliginosus</i> V BC	This is a coastal species , foraging on rocky shorelines and in estuaries (Pizzey & Knight 2003) for molluscs and other invertebrates .		Present	likely	No  Extent of the proposed action would not impact this species
Spotted Harrier <i>Circus assimilis</i> V BC	The Spotted Harrier occurs throughout the Australian mainland , except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population . Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland , grassland and shrub steppe . It is found most commonly in native grassland , but also occurs in agricultural land , foraging over open habitats including edges of inland wetlands . Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months.  Preys on terrestrial mammals (eg bandicoots, bettongs , and rodents), birds and reptile , occasionally insects and rarely carrion .		Present	Vagrant	No  Extent of the proposed action would not impact this species
Square-tailed Kite <i>Lophoictinia isura</i> V BC	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia , Queensland, NSW and Victoria . In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north , north-east and along the major west-flowing river systems. It is a 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 .  Is a specialist hunter of passerines , especially honeyeaters , and most particularly nestlings, and insects in the tree canopy , picking most prey items from the outer foliage .  Appears to occupy large hunting ranges of more than 100km <sup>2</sup> .  Breeding is from July to February, with nest sites generally located along or near water courses, in a fork or on large horizontal limbs.		Present	Vagrant	No  Extent of the proposed action would not impact this species
Striated Fieldwren <i>Calamanthus fuliginosus</i> EI BC	The Striated Fieldwren is found in coastal swamp heaths and tussock fields of south-eastern NSW, into southern Victoria and the south-east of South Australia. It is also found in Tasmania. There are four recognised subspecies , but only one ( <i>albilaris</i> ) occurs in NSW. Most records are from two main regions - the far south coast (Nadgee NR and Ben Boyd NP) and in Morton NP (Little For est, Tianjara Falls) though there are scattered records in between these two areas (particularly in coastal habitats) . Is occasionally recorded further north with records at Bilpin (1979), Kurnell (1979) and Mittagong (1992), though there do not appear to be resident populations at any of these sites . Mainly a bird of ground and understorey vegetation , and can be found in swampy, coastal heathlands , tussocky grasslands, low shrubby vegetation and margins of swamps.		Absent	Unlikely	No
Superb Fruit-Dove <i>Ptilinopus superbus</i> V BC	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south , where it is largely confined to pockets of suitable habitat as far south as Moruya . There are records of vagrants as far south as eastern Victoria and Tasmania. Inhabits rainforest and similar closed forests where it forages high in the canopy , eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. Part of the population is migratory or nomadic. There are records of single birds flying into lighted windows		Marginal	Unlikely	No

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
	and lighthouses, indicating that birds travel at night. At least some of the population, particularly young birds, moves south through Sydney.				
Swift Parrot <i>Lathamus discolour</i> EI BC EPBC E	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. 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>Carymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Mugga Ironbark <i>E. side roxylan</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. maluccana</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 glabulus</i> .	yes	Present	Vagrant	No  Extent of the proposed action would not impact this species
Varied Sittella <i>Daphoenositta chrysoptera</i> V BC	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.		Present	Likely	No  Extent of the proposed action would not impact this species
White-bellied Sea Eagle <i>Haliaeetus leucogaster</i> V BC M EPBC	The White-bellied Sea-Eagle is distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. It also extends inland along some of the larger water ways, especially in eastern Australia.  Breeding has been recorded from only a relatively small area of the total distribution. Breeding records are patchily distributed, mainly along the coastline, and especially the eastern coast, extending from Queensland to Victoria, and to Tasmania.		Present	Present	No  Extent of the proposed action would not impact this species
White-fronted Chat <i>Epthianura albifrons</i> V BC	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.  Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.		Marginal	Unlikely	No
White-throated	The White-throated Needletail is widespread in eastern and south-eastern Australia (Barrett et al. 2003; Blakers et al. 1984; Higgins 1999). In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western		Present	Present	No

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Needletail <i>Hirundapus caudacutus</i> M EPBC	slopes of the Great Divide and occasionally onto the adjacent inland plains .  In Australia , the White-throated Needletail is almost exclusively aerial , from heights of less than 1 m up to more than 1000 m above the ground (Coventry 1989; Tarburton 1993; Watson 1955). Because they are aerial , it has been stated that conventional habitat descriptions are inapplicable (Cramp 1985), 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 (Higgins 1999). In coastal areas , they are sometimes seen flying over sandy beaches or mudflats (Cooper 1971; Crompton 1936; Davis 1965), and often around coastal cliffs and other areas with prominent updraughts , such as ridges and sand-dunes (Cooper 1971; Dawson et al. 1991; Loyn 1980; Mitchell et al. 1996; Schulz & Kristensen 1994). They are sometimes recorded above islands well out to sea (Brandis et al. 1992; Cooper 1971; Warham 1957).				Extent of the proposed action would not impact this species
<b>Mammals</b>					
Spotted-tailed Quall <i>Dasyurus maculatus</i> V BC E EPBC	The range of the Spotted-tailed Quall has contracted considerably since European settle ment. It is now found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common. Use 'latrine sites ' , often on flat rocks among boulder fields and rocky cliff- faces; these may be visited by a number of individuals; latrine sites can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals. 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 . Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites . Mostly nocturnal , although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds.  Consumes a variety of prey, including gliders, possums, small wallabies , rats , birds , bandicoots, rabbits and insects; also eats carrion and takes domestic fowl.Females occupy home ranges up to about 750 hectares and males up to 3500 hectares; usually traverse their ranges along densely vegetated creeklines .		Marginal foraging habitat only	Vagrant	No  Extent of the proposed action would not impact this species
Brush-tailed Phascogale <i>Phascogale tapoatafa</i> V BC	The Brush-tailed Phascogale has a patchy distribution around the coast of Australia . In NSW it is mainly found east of the Great Dividing Range although there are occasional records west to the divide.  Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses , shrubs or leaf litter . Also inhabit heath , swamps, rainforest and wet sclerophyll forest. Females have exclusive territories of approximately 20 - 60 ha, while males have overlapping territories of up to 100 ha. Nest and shelter in tree hollows with entrances 2.5 - 4 cm wide and use many different hollows over a short time span. Mating occurs May -July; males die soon after the mating season whereas females can live for up to three years but generally only produce one litter.		Marginal foraging habitat only	Unlikely	No
White-footed Dunnart <i>Sminthopsis leucopus</i> V BC	The White-footed Dunnart occurs in Tasmania and along the Victorian and southern NSW coast . The Shoalhaven area is the species' northern-most limit . It has not been recorded west of the coastal escarpment with the western-most record being from Coolangubra State Forest, approximately 10 km south-east of Bombala .  The White-footed Dunnart is found in a range of different habitats across its distribution , including coastal dune vegetation , coastal forest , tussock grassland and sedgeland , heathland , woodland and forest.  In NSW, the species seems to favour vegetation communities with an open understorey structure (contrasting with populations		Marginal	Unlikely	No



BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
	in Victoria which apparently prefer dense shrub and ground layers). It is patchily distributed across these habitats and, where present, typically occurs at low densities .				
Southern Brown Bandicoot (eastern)  <i>Isoodon obesu/us obesu/us</i>  EI BC EEPBC	The Southern Brown Bandicoot has a patchy distribution. It is found in south-eastern NSW, east of the Great Dividing Range south from the Hawkesbury River, southern coastal Victoria and the Grampian Ranges, south-eastern South Australia , south-west Western Australia and the northern tip of Queensland. 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. They feed on a variety of ground-dwelling invertebrates and the fruit-bodies of hypogeous (underground-fruited) fungi. Their searches for food often create distinctive conical holes in the soil. Males have a home range of approximately 5-20 hectares whilst females forage over smaller areas of about 2-3 hectares .		Absent	Unlikely	No
Koala  <i>Phascolarctos cinereus</i>  V BC	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. It was briefly historically abundant in the 1890s in the Bega District on the south coast of NSW, although not elsewhere, but it now occurs in sparse and possibly disjunct populations . Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species , but in any one area will select preferred browse species . Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat , ranging from less than two ha to several hundred hectares in size. Generally solitary, but have complex social hierarchies based on a dominant male with a territory overlapping several females and sub-ordinate males on the periphery.		Present	Unlikely (no recent or local records)	No
Eastern Pygmy-possum  <i>Cercartetus nanus</i>  V BC	The Eastern Pygmy-possum is found in south-eastern Australia , from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga , Dubbo , Parkes and Wagga Wagga on the western slopes . 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, except in north-eastern NSW where they are most frequently encountered in rainforest . Feeds largely on nectar and pollen collected from banksias , eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias ; soft fruits are eaten when flowers are unavailable. Shelters in tree hollows, rotten stumps, holes in the ground , abandoned bird-nests, Ringtail Possum ( <i>Pseudocheirus peregrinus</i> ) dreys or thickets of vegetation, (eg. grass-tree skirts); nest-building appears to be restricted to breeding females; tree hollows are favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks.		Marginal (no banksias)	Unlikely	No
Yellow-bellied Glider  <i>Petaurus australis</i>  V BC	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range , from southern Queensland to Victoria . Extract sap by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive 'V'-shaped scar. Live in small family groups of two - six individuals and are nocturnal. Den, often in family groups, in hollows of large trees. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils . Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north ; moist coastal gullies and creek flats to tall montane forests in the south .		Present  (no feed trees were recorded on or adjacent to the site)	Possible	No  Extent of proposed action would not impact this species
Long-nosed Potoroo	The Long-nosed Potoroo is found on the south-eastern coast of Australia , from Queensland to eastern Victoria and Tasmania, including some of the Bass Strait islands. There are geographically isolated populations in western Victoria . In NSW it is generally		Marginal	Unlikely	No

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
<i>Potorous tridactylus</i> V BC V EPBC	restricted to coastal heaths and forests east of the Great Dividing Range , with an annual rainfall exceeding 760 mm. 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. The fruit-bodies of hypogeous (underground-fruited) fungi are a large component of the diet of the Long-nosed Potoroo . They also eat roots, tubers, insects and their larvae and other soft-bodied animals in the soil. Often digs small holes in the ground in a similar way to bandicoots. Mainly nocturnal, hiding by day in dense vegetation - however, during the winter months animals may forage during daylight hours.				Extent of proposed action would not impact this species
Grey-headed Flying-fox <i>Pteropus poliocephalus</i> V BC V EPBC	Grey-headed Flying-foxes are found within 200 km of the eastern coast of Australia , from Bunda berg in Queensland to Melbourne in Victoria. 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, birth and the rearing of young . Annual mating commences in January and a single young is born each October or November . Site fidelity to camps is high with some caps being used for over a century . Travel up to 50 km to forage. 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 and can inflict severe crop damage.		Present  Foraging only	Possible	No  Extent of proposed action would not impact this species
Eastern Freetail-bat <i>Mormopterus norfolkensis</i> V BC	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest , woodland , swamp forests and mangrove forests east of the Great Dividing Range . Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous .		Present	Possible	No  Extent of proposed action would not impact this species
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i> V BC	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer.		Marginal	Unlikely	No
Golden-tipped Bat <i>Kerivoula papuensis</i> V BC	The Golden-tipped Bat is distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW. Also occurs in New Guinea. Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests. Roost mainly in abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests, also in tree hollows, dense foliage and epiphytes; located in rainforest gullies on small first- and second-order streams. Will fly up to two km from roosts to forage in rainforest and sclerophyll forest on mid and upper-slopes. Specialist feeder on small web-building spiders .		Marginal	Unlikely	No
Eastern Bent-wing bat <i>Miniopterus schreibersii oceanensis</i> V BC	Eastern Bent-wing Bats occur along the east and north-west coasts of Australia . Caves are the primary roosting habitat , but also use derelict mines, storm-water tunnels, buildings and other man-made structures . Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young . Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia . Breeding or roosting colonies can number from 100 to 150,000 individuals . Hunt in forested areas , catching moths and other flying insects above the tree tops.		Present  Foraging only	Possible	No

BVSC - Review of Environmental Factors - Beauty Point Boat Ramp

Species and Status	Ecology/ habitat <sup>2</sup>	Records within 10 km	Presence of habitat	Likelihood of occurrence	Assessment of significance required
Southern Myotis <i>Myotis macropus</i> V BC	The Large-footed Myotis is found in the coastal band from the north-west of Australia , across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally roost in groups of 10 - 15 close to water in caves, mine shafts , hollow-bearing trees, storm water channels , buildings , under bridges and in dense foliage . Forage over streams and pools catching insects and small fish by raking their feet across the water sur face. In NSW females have one young each year usually in November or December.		Present	possible	No  Extent of proposed action would not impact this species
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i> V BC	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range , from north-eastern Victoria to the Atherton Tableland . It extends to the coast over much of its range . In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest , though it is most commonly found in tall wet forest . Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large , slow-flying insects; this species has been known to eat other bat species . Little is known of its reproductive cycle, however a single young is born in Januar y; prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young .		Present	Unlikely	No
<b>Fish</b>					
Australian Grayling <i>Prototroctes maraena</i> PFM V EPBC	Australian grayling occur in freshwater streams and rivers, especially clear gravelly streams with a moderate flow, as well as estuarine areas . They occur in fast-moving shoals and are a shy fish, fleeing when disturbed. They reach sexual maturity at 1-2 years of age when approximately 150 mm in length. Spawning takes place during late summer or autu mn. Females can lay up to 82 000 small (appro x. 1 mm) eggs, probably in the middle reaches of rivers, where they presumably settle among the gravel of the strea mbed. Once hatched , the larvae swim towards the water surface where they are swept downstream to the sea. The larvae and young juveniles have a marine stage before returning to freshwater rivers during spring when they are about 6 months old. The rest of their life cycle is spent in freshwater. Australian grayling are opportunistic omnivores, with a mixed diet of aquatic algae and insects.		Absent	Unlikely	No
<p>E BC= listed as Endangered under Schedule 1 of the NSW <i>Biodiversity Conservation Act</i> 2016 (EI - Endangered, E2 - Endangered Population , E4A- Critically Endangered)</p> <p>E EPBC = listed as Endangered under the Commonwealth <i>Environment Protection &amp; Biodiversity Conservation Act 1999</i> .</p> <p>V BC= listed as Vulnerable under Schedule 2 of the NSW <i>Biodiversity Conservation Act</i> 2016.</p> <p>V EPBC = listed as Vulnerable under the Commonwealth <i>Environment Protection &amp; Biodiversity Conservation Act 1999</i> .</p> <p>M EPBC = listed as Migratory under the Commonwealth <i>Environment Protection &amp; Biodiversity Conservation Act 1999</i>.</p>			<p>CE EPBC = listed as Critically Endangered under the Commonwealth <i>Environment Protection &amp; Biodiversity Conservation Act 1999</i>.</p> <p>CAMBA= Chinese-Australia Migratory Bird Agreement</p> <p>JAMBA= Japan-Australia Migratory Bird Agreement</p> <p>P FM= Protected under the NSW <i>Fisheries Management Act 1994</i></p>		

References: Information in this table is sourced from the NSW DECCW Threatened Species Pro fil es, available online at: [http:// www.threatenedspecies .environment.nsw .gov.au/ tspro file/ home \\_species.aspx](http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/home_species.aspx)