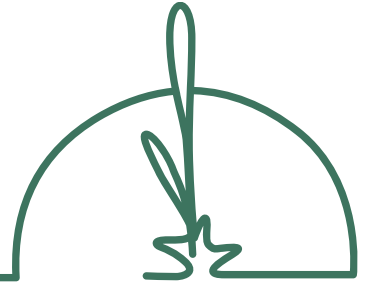


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Woollooware Bay Town Centre
Foreshore Park

Section 75W Modification to Concept Plan

Ecological & Environmental Outcomes & Assessment

F Dominic Fanning - Gunninah

November 2016

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This document and the intellectual material it contains have been prepared by the principal author (Mr F Dominic Fanning) for the specific purposes described herein.

It has been prepared in cognition of Division 2 Part 31 of the *Uniform Civil Procedures Rules* (UCPRs) and the *Expert Witness Code of Conduct* contained in Schedule 7 to the UCPRs – as practised *inter alia* in the NSW Land & Environment Court.

Any interpretation of this *Report* or any extraction from it are subject to the approval of the author.

**WOOLLOOWARE BAY TOWN CENTRE
FORESHORE PARK**

SECTION 75W MODIFICATION to CONCEPT PLAN

ECOLOGICAL & ENVIRONMENTAL OUTCOMES & ASSESSMENT

November 2016

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- Appendix A The current *Foreshore Park* design of Habit8
- Appendix B Photographs of the subject site and the Woollooware Bay foreshore
- Appendix C The previous designs for the Foreshore Park

**WOOLOOWARE BAY TOWN CENTRE
FORESHORE PARK**

SECTION 75W MODIFICATION to CONCEPT PLAN

ECOLOGICAL & ENVIRONMENTAL OUTCOMES & ASSESSMENT

November 2016

1 INTRODUCTION

1.1 The Subject Land

The land which is addressed specifically in this *Report* (referred to hereafter as the “*Woollooware Bay Town Centre Foreshore Park*” or the “*Foreshore Park*”) is the foreshore land along Woollooware Bay (and a narrow strip of land extending to the south). This land is associated with the Cronulla Sharks re-development project - Woollooware Bay Town Centre - on the southern side of Botany Bay at 475 Captain Cook Drive, Woollooware Bay (see plan below and Appendix A).

The Woollooware Bay Foreshore Park will occupy a strip land of variable width (from approximately 15m to approximately 60m), approximately 520m in length - located along the foreshore of Woollooware Bay (as detailed in Appendix A and below); in addition to the strip of land along the Channel to the immediate south.

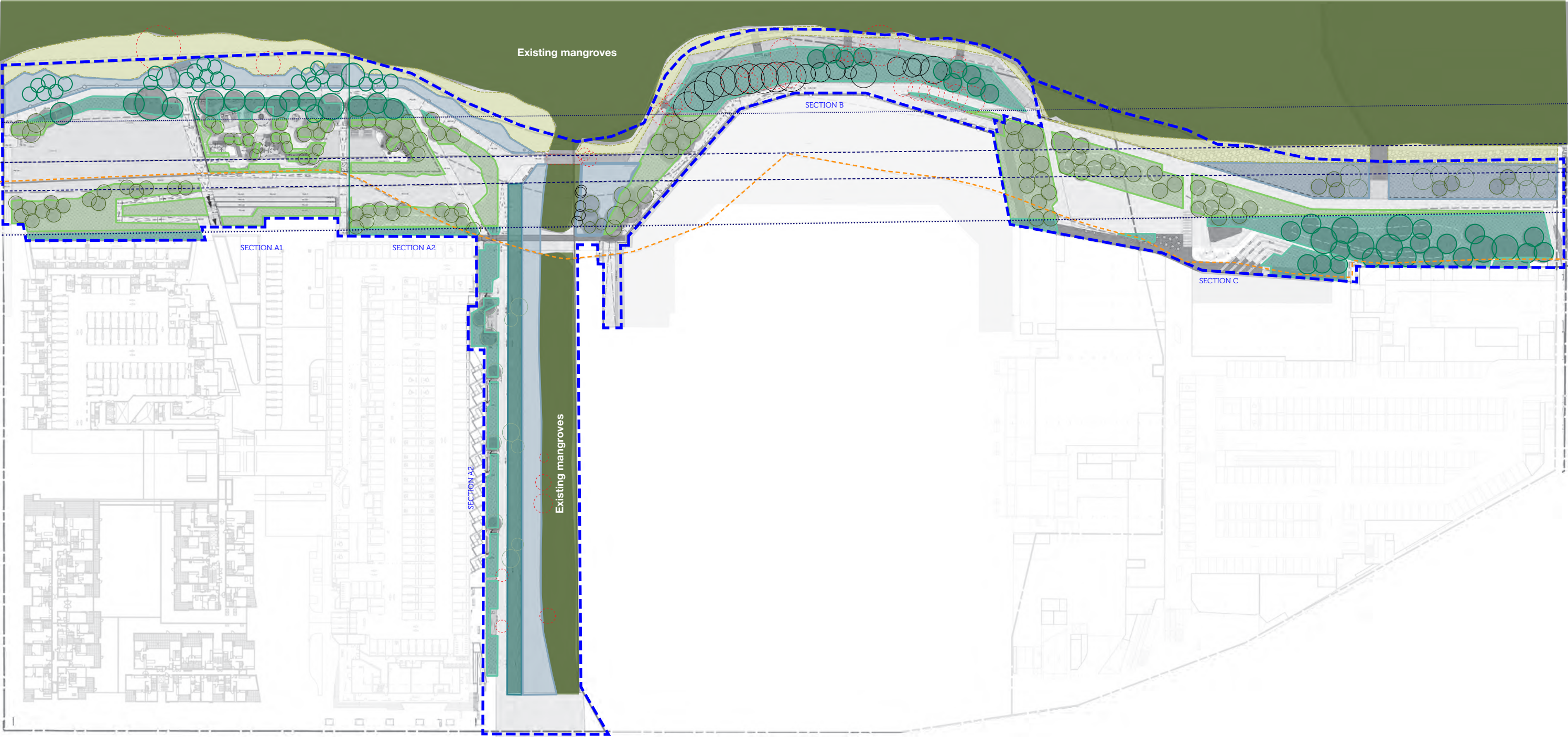
The Foreshore Park is broadly located between the band of mangroves that lines the Bay and the Woollooware Bay Town Centre Precinct, as well as occupying a strip of land (containing a mangrove-lined canal) extending south from the foreshore to Captain Cook Drive - between the Western and the Central Portion of the subject land (see plan below and Appendix A).

There are three elements to the Woollooware Bay Town Centre – the “*subject land*” (see attached plan).

- The existing Club building and associated asphalt carpark (the **Eastern Portion** of the subject land) – which is to be re-developed as a commercial and retail centre; and the associated Club facilities.
- The main football arena (Southern Cross Group Stadium) and associated features (the **Central Portion** of the subject land) – which is to be retained, with works for the Foreshore Park proposed only along a narrow band of land on the northern side of Family Hill.
- The old practice fields (the **Western Portion** of the subject land) – the site of the current residential development immediately south of the proposed Foreshore Park (see photographs in Appendix B). This element of the subject land also contains the existing ‘north-south’ mangrove-lined canal.

As noted above, the Woollooware Bay Foreshore Park itself occupies only the northern part of the subject land, as well as the strip of land along the mangrove-lined canal between Captain Cook Drive and Woollooware Bay (see figure below) – with most of the Foreshore Park currently being occupied by existing fill material, previous grassed playing fields and/or asphalt carparks (see photographs in Appendix B).

Planting Community Zones:



Key:

- 40m Setback from MHWM
- Ausgrid HV cables
- Ausgrid HV cable easement

Note:
All planting species selected with ecologist
from VMP, Southernland Shire Council plant list
and Ausgrid approved easement plant list

Existing vegetation

- Existing trees to be retained
- Existing trees to be removed
- Existing mangroves to be retained
- Existing mangroves to be removed

Planting types

- Salt marsh planting
- Lower Riparian planting
- Swale planting
- Upper Riparian planting (outside HV cables)
- Upper Riparian planting (under HV cables)

Trees

- Proposed Trees (Outside HV Cables)
- Proposed Trees (Inside HV Cables)
- Foreshore Park Trees**
Outside HV Easement (large trees) = 44
Inside HV Easement (small trees) = 63
- Drainage Channel Trees**
Embankment and Swale = 12

- Mangrove Boardwalk Trees**
Outside HV Easement (large trees) = 10
Inside HV Easement (small trees) = 15
- Retail Foreshore Trees**
Outside HV Easement (large trees) = 24
Inside HV Easement (small trees) = 49

TOTAL TREES: 227



1.2 Circumstances

The Woollooware Bay Foreshore Park (see plan below and details in Appendix A) is the subject of a proposal by Capital Bluestone Pty Ltd for areas of riparian rehabilitation and for the provision of an array of appropriate and complementary community facilities – such as a dedicated child’s playground, parks, pedestrian and bicycle paths.

The previously approved *Concept Plan* for the Woollooware Bay Town Centre project (MP10_0229) included a scheme for the rehabilitation and enhancement of the foreshore land (albeit in a different configuration than that currently proposed) – with areas designed for community and public access, and play areas, as well as areas of riparian rehabilitation where there are currently asphalt carparks or grassed playing fields. That approved *Concept Plan* (dated 27/08/2012) is included in Appendix C.

Subsequently, the proponent (Capital Bluestone Pty Ltd) prepared a Section 75W Modification to the Concept Plan by Aspect Studios (dated November 2015) – which amended the distribution and location of many of the elements of the original (approved) *Concept Plan* (Appendix C). This earlier Section 75W design was the subject of commentary and criticism by several government agencies – in respect of the areas of riparian buffers, incursions into the 20m and 40m riparian zones, and potential or assumed impacts on ecological outcomes.

The current Section 75W Modification to the Concept Plan prepared by Habit8 (dated November 2016; see below) is also included in Appendix C. This current design has addressed the issues raised by the various government agencies (see subsequent Chapters of this *Report*); and also proposes substantial areas of riparian rehabilitation and creation; along with turf open space areas, children’s playgrounds, and other appropriate and ‘low key’ social and community facilities.

1.3 Issues

The primary ecological and environmental issues are as follows.

- The desire of various government agencies for a 40m fully rehabilitated riparian zone along the foreshore – notwithstanding the current condition of most of the foreshore within the subject land; and despite the circumstances of adjoining foreshore lands extending to the east and west of the subject site (as documented in detail in Chapters 4 and 5 of this *Report*, and in Appendix B)
- The critical importance of water quality outcomes, and the commitment to improving water quality along the foreshore land – given the lack of any water quality controls along the foreshore land at present (other than those associated with current development activities)
- The ability to achieve those water quality improvements - irrespective of the width of any riparian zone
- Assumptions regarding the ‘necessity’ for certain buffers to achieve the desired ecological and environmental outcomes
- The need to avoid adverse impacts on the mangrove forest present along and to the immediate north of the foreshore land
- The opportunities for the re-creation of saltmarsh vegetation (which is essentially absent currently) to the south of some areas of mangroves within the foreshore land

- The benefits that will accrue to the existing mangroves and to Woollooware Bay as a result of significant improvements in water quality discharges
- The benefits of an increased band of adjoining native vegetation – with a greater array of plant species providing additional and complementary habitat for native biota
- The increased engagement of the public with the natural environment - through access along pathways, the provision of educational signage, recreation opportunities, waste control and other facilities *etc*

2 INFORMATION BASE and ASSUMPTIONS

The author of this *Report* visited the subject land, and the Woollooware Bay foreshore as far as Taren Point, on 04 May 2016 – to re-acquaint with the site and to collect photographs of the nature and condition of the foreshore at present.

In addition, the author of this *Report* was the principal ecologist for a previous proposal to re-develop the Sharks club and carpark (in about 1999), and consequently has a detailed understanding of the circumstances of the subject land.

I have also been involved in a substantial number of other projects in the locality – including *inter alia*:

- the Shearwater Landings development at Greenhills Beach
- the residential development by Australand at Greenhills Beach
- the Cronulla STP upgrade and discharge pipe replication
- many projects further along the Kurnell Peninsula (sand extraction proposals; various industrial developments; activities on the now desalination plant site; Land & Environment court cases *etc*)
- review of the Breen lands on Towra Point
- a proposed commercial development at Bay Road, Taren Point.

Other relevant sources of information include -

- the documents associated with the development approval for the Cronulla Sharks *Redevelopment Concept Plan* – in 2012
- the *Woollooware Bay Town Centre Foreshore Park – Section 75W (Modification to Concept Plan)* document prepared by Habit8 (Appendix A)
- submissions from government agencies regarding the previous version of the proposed Section 75W amendment
- documents regarding the Towra Point Nature Reserve
- the general scientific literature regarding relevant biota.

3 STATUTORY CONSIDERATIONS

The relevant statutes that have been taken into account in this Report include *inter alia* –

- The *Water Management Act 2000*
- The *Fisheries Management Act 1994*
- The *Threatened Species Conservation Act 1995*
- The *Environment Protection & Biodiversity Conservation Act 1999*
- The *Guidelines for Riparian Corridors on Waterfront Land*

4 EXISTING SITE CIRCUMSTANCES

The land which is the subject of this *Report* – the Woollooware Bay Foreshore Park (see Figure 1 above and the *Landscape Plan* in Appendix A) – currently, and in recent times, consists of four main elements (the Western Park, the Central Park, the Eastern Park and the Channel) – as detailed below. Each of these elements has different existing and recent characteristics, and each is to be treated somewhat differently in the current proposal.

4.1 Western Park

Until recently, the area of the Western Park consisted of turfed football playing fields (introduced and maintained grasses) – similar to those still located to its immediate west. The land to the immediate south of the Western Park (to Captain Cook Drive) is currently a construction site for the approved residential precinct of the Woollooware Bay Town centre project (see photographs in Appendix B).

There were no particular measures provided to protect the mangroves or foreshore areas during the long period of use of the playing fields, and there are significant areas of weed-infestation along this part of the foreshore (see photographs in Appendix B). No specific water quality control or treatment measures were in place, and there were no measures to protect the adjoining mangroves.

The Western Park area is currently substantially covered by a mound of excavated material derived from the construction site to the immediate south (see Appendix B); which will ultimately be removed and the area rehabilitated according to the proposed *Foreshore Park Landscape Plan* (Appendix A).

4.2 Central Park

The central portion of the Foreshore Park, immediately north of the existing Shark Park Rugby League facility (the Stadium), consists of a substantial mound of deposited fill material. This area (known as Family Hill) is covered with introduced trees and an unconsolidated slope down to the mangroves on its northern side, with areas of paving and rubble to the south (see photographs in Appendix B).

This feature of the proposed Foreshore Park has been present for in this state for a considerable period, and is currently in poor to extremely poor condition (from an ecological perspective). There are extensive patches of weeds, areas of bare earth and inaccessible slopes – with some damage to the adjoining mangroves (see Appendix B).

The Family Hill area is only partly a subject of the current proposal (see Appendix A). That part of the Family Hill which slopes down (in a northerly direction) to the mangroves, and the new formalised pathway at the top of the mound, are part of the Woollooware Bay Foreshore Park project. Remediation of the area which slopes down to the stadium is not part of the current proposal.

4.3 Eastern Park

The eastern portion of the Foreshore Park (the Eastern Park) consists currently of an asphalt carpark (see Appendices A and B); and is the subject of a separate *Development Application* for a mixed commercial and residential development.

There had been essentially no protection of the adjoining mangroves or of the habitats in Woollooware Bay over the long period this carpark has been in use, and no particular measures for the treatment or control of water quality in stormwater runoff from the carpark.

In addition, the mangroves abutting the carpark would have long been exposed to heavy evening use – with disturbance from car headlights and noise a regular feature of this area.

There is an existing mangrove boardwalk and observation platform from the carpark – which was an excellent public education feature. However, this feature has become dilapidated and unsafe; and it is proposed that the boardwalk and observation platform be repaired or replaced as part of the new Foreshore Park project.

4.4 The Channel

The channel between the Western and Central Portions of the subject land is artificial – having been constructed to convey stormwater from Captain Cook Drive to Woollooware Bay. The channel also drains the golf course and urban development upslope of the subject land, as well as the road itself.

There appears to be little or no active water quality management features along this feature, and there are very high levels of urban debris and rubbish present. There is also an adjoining road and carpark along the channel (see photographs in Appendix B).

4.5 Quality Controls

As discussed above, there are currently few, if any, controls on water quality and/or urban refuse being discharged into the mangroves and habitats of Woollooware Bay.

In addition, currently and/or until very recently, the ‘riparian zone’ along the Woollooware Bay foreshore is and/or has consisted of a variety of largely unsympathetic land uses –

- Introduced grassland –no controls on water quality or weed invasion (in the Western Park)
- Unmanaged fill material – with high levels of weed cover and no water discharge quality controls (in the Central Park)
- An asphalt carpark – with no water discharge quality controls (in the Eastern Park)
- An unmanaged channel (invaded by mangroves) with high levels of urban refuse and poor water quality management (in the Channel)

Notwithstanding those circumstances, the condition of the mangroves to the immediate north, and indeed elsewhere along the Woollooware Bay foreshore (FDF *pers obs*) is regarded as ‘excellent’. In this regard, DPI Fisheries makes the following comment – “*the mangrove forest in Towra Point Aquatic Reserve adjacent to this site is **mostly in excellent condition**, apart from the long-term poor litter management practices at this site, which should be remediated as part of the site redevelopment*” (emphasis added).

It is noted that the current proposal for the Foreshore Park (Appendix A) will substantially and significantly improve the quality of stormwater discharges from the site, and the management of the Foreshore Park will constitute a VERY significant enhancement of the Woollooware Bay foreshore and the mangrove forest and associated habitats at this location (including with respect to “*litter management practices*”).

5 NEARBY FORESHORE TREATMENTS

The Woollooware Bay foreshore, both to the east and to the west of the Sharks Park development land, has been subjected to an array of treatments and developments – over a long period (see Photographic Essay in Appendix B). Many of the previous treatments and management of the Woollooware Bay foreshore have been minimalistic, inappropriate and/or perfunctory.

The existing riparian zone along the Woollooware Bay foreshore has a number of characteristics (see Appendix C) – as detailed below.

- Conservation efforts within the riparian zone to date have been minimal in many places – with most areas along the waterfront having only extremely limited (often <5m) native riparian zones.
- A boardwalk in parts (similar to that proposed for the subject site). Many parts of the existing boardwalk and walking paths are immediately adjacent to the mangroves – without any apparent significant impacts.
- Substantial encroachments of industrial development, carparks and storage areas into the riparian zone (*ie much less than 20 metres from the mangroves*).
- No, limited and/or poor stormwater treatment and management.

Notwithstanding the poor quality and the minimal extent of the current treatment and management of the Woollooware Bay foreshore, there are some good (to ‘excellent’) outcomes in places (see photographs in Appendix B).

- Many areas along the waterfront have only very limited weed-infestation.
- There are extensive areas of mangrove forest with very high levels of mangrove recruitment – indicating at least ‘reasonable’ water quality conditions (and/or the high tolerance of mangroves to different water quality conditions).
- Little or no evidence of disease or poor health within the mangrove forests – despite the minimal levels of water quality controls in most instances.
- The positive values of the boardwalk and pedestrian/bicycle path - which fosters public engagement with the natural features of the area.
- Note that the existing boardwalk and pedestrian/bicycle path (installed by or with the approval of Council; and presumably with the approval of the relevant government agencies) are, in many locations, immediately adjacent to the mangrove forest along the Woollooware Bay foreshore (apparently without any substantial adverse impacts).

As noted above, DPI Fisheries makes the following comment – “*the mangrove forest in Towra Point Aquatic Reserve adjacent to this site [ie adjacent to the Foreshore Park site] is **mostly in excellent condition***” (emphasis added).

Similar considerations apply elsewhere along the Woollooware Bay foreshore, as discussed above (see Appendix B).

The Woollooware Bay Foreshore Park which is currently proposed on the subject site (as documented in Appendix A and as discussed in this *Report*) will be significantly superior to any treatment of any part of the riparian buffer (associated with any development) which currently exists anywhere along the Woollooware Bay foreshore to the east and west.

6 ENVIRONMENTAL OUTCOMES

6.1 An Integrated Approach

The proposed Woollooware Bay Foreshore Park on the subject site (as documented in Appendix A) will involve *inter alia* a comprehensive clean-up of and a major improvement in current circumstances along this part of the Woollooware Bay foreshore (Appendix B).

Further – it will result in the best (by a very long margin) riparian, environmental, ecological and social outcome along the whole of the Woollooware Bay foreshore - from east of the subject site all the way to the Captain Cook Bridge at Taren Point.

The proposed Woollooware Bay Foreshore Park proposal seeks to achieve a balance of social and environmental benefits. In this regard, the current proposal is a **very substantial** environmental benefit compared to existing circumstances along this part of the Woollooware Bay foreshore (see photographs in Appendix B), and compared to the treatment of other parts of the Woollooware Bay foreshore (see photographs in Appendix B).

The current proposal will achieve all of the ecological and environmental (water and habitat quality) outcomes sought by all of the relevant government agencies – whilst not necessarily satisfying all of the specific ‘formulaic’ requirements of those agencies (see further discussion below).

Opportunities for environmental outcomes include the following.

- The rehabilitation of the few very small areas of existing native vegetation within the footprint of the Woollooware Bay Foreshore Park
- The regeneration and/or re-creation substantial areas of native vegetation (see Chapter 6.2)
- The protection and improvement of the fringing mangroves and of the aquatic habitats in Woollooware Bay – *inter alia* by major improvements in the water quality of discharges from the subject land

There are also significant opportunities for major social, community and educational benefits associated with the proposed Woollooware Bay Foreshore Park on the subject site - including the following.

- Increased and improved interaction between people and the natural environment
- Improved education regarding the importance and value of the natural environment, and natural processes
- The promotion of passive recreation and improved health outcomes
- Improved social interactions and opportunities for families and children

These social, community and educational benefits should be taken into account when considering the requirements and expectations of the relevant government agencies.

This is particularly relevant - given that the environmental goals and objectives of the relevant statutes will be achieved by the current design for the Foreshore Park. Notwithstanding the ‘reservations’ of some in the relevant agencies, there can be no doubt that the current Foreshore Park proposal will result in **substantially and significantly** improved environmental outcomes, and will result in the benefits sought by those agencies – as discussed in further detail below.

6.2 Rehabilitation and Regeneration

The proposed Woollooware Bay Foreshore Park (Appendix A) provides the following opportunities for environmental rehabilitation and the regeneration of native riparian and other associated vegetation – as demonstrated in the attached plan extracted from Appendix A.

- The removal of substantial areas of weeds (particularly along the Western and Central Park areas) and rubbish (along all of the Park frontage and along the Channel)
- The removal of old built-form and inappropriate works – in particular the asphalt carpark which occupies the Eastern Park
- Re-contouring of most of the Park – to provide a more appropriate and gradual landform rising from the mangrove forest, and in part to manage stormwater flows
- The retention and rehabilitation of a few small areas of existing native vegetation within the proposed Foreshore Park footprint (eg the mangroves along the canal)
- A major replanting and regeneration program – creating substantial stands of riparian and other native vegetation in areas that are currently characterised by weeds, introduced grass fields, asphalt carparks or built form (see details in Appendix A)
- The creation of areas of saltmarsh vegetation – where there currently is no such vegetation (see details in Appendix A)

The areas of the various plantings proposed in the Foreshore Park (along the Woollooware Bay foreshore but not including the Channel section of the Foreshore Park) are as follows (see details in Appendix A).

- | | |
|---------------------------------|----------------------------|
| • Saltmarsh | ~6,300m ² |
| • Riparian and Swale Plantings | ~8,400m ² |
| • Total Native Plantings | 14,700m² |

It is noted that there are, in addition, approximately 4,000m² of saltmarsh, riparian and swale plantings along the Channel – which results in a substantial exceedance of the offsets required to satisfy the ‘averaging rule’ of DPI Water with respect to riparian zones (see Chapter 7).

Currently – other than the mangroves along the Channel – there is essentially NO native vegetation within the footprint of the Foreshore Park (see photographs in Appendix B).

The proposed Woollooware Bay Foreshore Park – as designed by Habit8 (Appendix A) – will result in the provision of approximately 1.9ha of native riparian vegetation; where currently there is in essence none. This constitutes a very substantial and significant improvement over current circumstances at this location.

6.3 Water Management

There is at present essentially no control or treatment of stormwater discharges from any parts of the subject site or the subject land, other than those areas which are currently being developed. Similarly, there is little or no management of stormwater water being discharged from the adjoining road system and urban environment.

The proposed Woollooware Bay Foreshore Park (Appendix A) provides the following opportunities for the **vastly** improved management of stormwater and water quality associated with this area – through the re-direction and control of stormwater flows.

All stormwater derived from the subject land and the subject site will be treated prior to its discharge into the mangroves and into Woollooware Bay – by the use of bioretention swales and water quality control/detention basins and/or by infiltration into the soil profile and filtering (of very small volumes) through the new native plantings (eg in the Western Park area and on Family Hill).

The proposed Woollooware Bay Foreshore Park (Appendix A) provides a vastly superior outcome to current circumstances on and around the subject site and the subject land.

The provision of a riparian buffer *per se*, and particularly a riparian buffer of any particular size, is not inherently necessary for the treatment and management of stormwater (depending on circumstances) – other than (in this instance) for the overland flows generated from some parts of the Foreshore Park itself. All stormwater generated by the built form elements of the remainder of the subject land (the Woollooware Bay Town Centre project) will be treated in dedicated features – prior to discharge into Woollooware Bay.

This represents a significant improvement over existing circumstances.

Furthermore, given the design of the proposed Woollooware Bay Foreshore Park, and the limited quantum of stormwater that it will generate, there is no scientific or objective rationale for the provision of a 40m wide ‘pure’ riparian vegetation corridor. The goals and requirements of the various government agencies can readily be achieved by the appropriate management of much smaller riparian zones.

It is noted that this circumstance is recognised in the DPI Water *Guidelines* for Riparian Zones – which facilitate the provision of 20m wide riparian setbacks (with offsets elsewhere).

The existing evidence from the riparian zone to the east and west of the subject land is that excellent environmental outcomes can be achieved with much smaller riparian zones (although the proponent does not advocate the outcomes illustrated in Appendix B). As noted by DPI Fisheries - “*the mangrove forest in Towra Point Aquatic Reserve adjacent to this site is **mostly in excellent condition***” (emphasis added).

The stormwater management regime for the development of the subject land, including that associated with the proposed Woollooware Bay Foreshore Park, will **significantly** and **substantially** improve the quality of stormwater currently emanating from the subject land, and will be substantially superior to that implemented on any other site along the Woollooware Bay foreshore.

6.4 Towra Point Nature Reserve

The Towra Point Nature Reserve is an area of approximately 600 hectares of estuary, wetlands, mangroves, saltmarsh and other associated habitats in the southern part of Botany Bay. It also includes an internationally listed Ramsar Wetland; and is recognised as a highly significant natural environment, and habitat for a great variety of threatened and migratory wading and shorebirds, as well as a wide array of other native biota and ecosystems.

The Nature Reserve extends northwards from the northern side of the subject land, and includes the mangrove forest around the southern side of Woollooware Bay.

As discussed above, the proposed Woollooware Bay Foreshore Park (Appendix A) provides for the vastly improved management of stormwater and water quality associated with the subject site and the subject land – through the re-direction and control of stormwater flows; and the resultant improvement in water quality discharges from the Foreshore Park over current circumstances.

All stormwater derived from the subject land and the subject site will be treated prior to its discharge into the mangroves and into Woollooware Bay – by the use of bioretention swales and water quality control/detention basins and/or by infiltration into the soil profile and filtering (of very small volumes) through the new native plantings (eg in the Western Park area and on Family Hill).

As noted above, DPI Fisheries has stated that “*the mangrove forest in Towra Point Aquatic Reserve adjacent to this site is **mostly in excellent condition***” (emphasis added). This is despite the lack of **any** stormwater quality controls at present.

As also noted above, the stormwater management regime for the development of the subject land, including that associated with the proposed Woollooware Bay Foreshore Park, will **significantly** and **substantially** improve the quality of stormwater currently emanating from the subject land – thus benefitting the Towra Point Nature Reserve.

In addition, the riparian treatment and plantings within and adjacent to the Woollooware Bay Foreshore Park will enhance the mangrove forest within the Nature Reserve – providing additional buffers to the mangroves and additional saltmarsh plantings.

The proposed Woollooware Bay Foreshore Park (Appendix A) will provide a significant nett benefit for the Towra Point Nature Reserve and Ramsar Wetland, and the native biota that depend on the habitats therein.

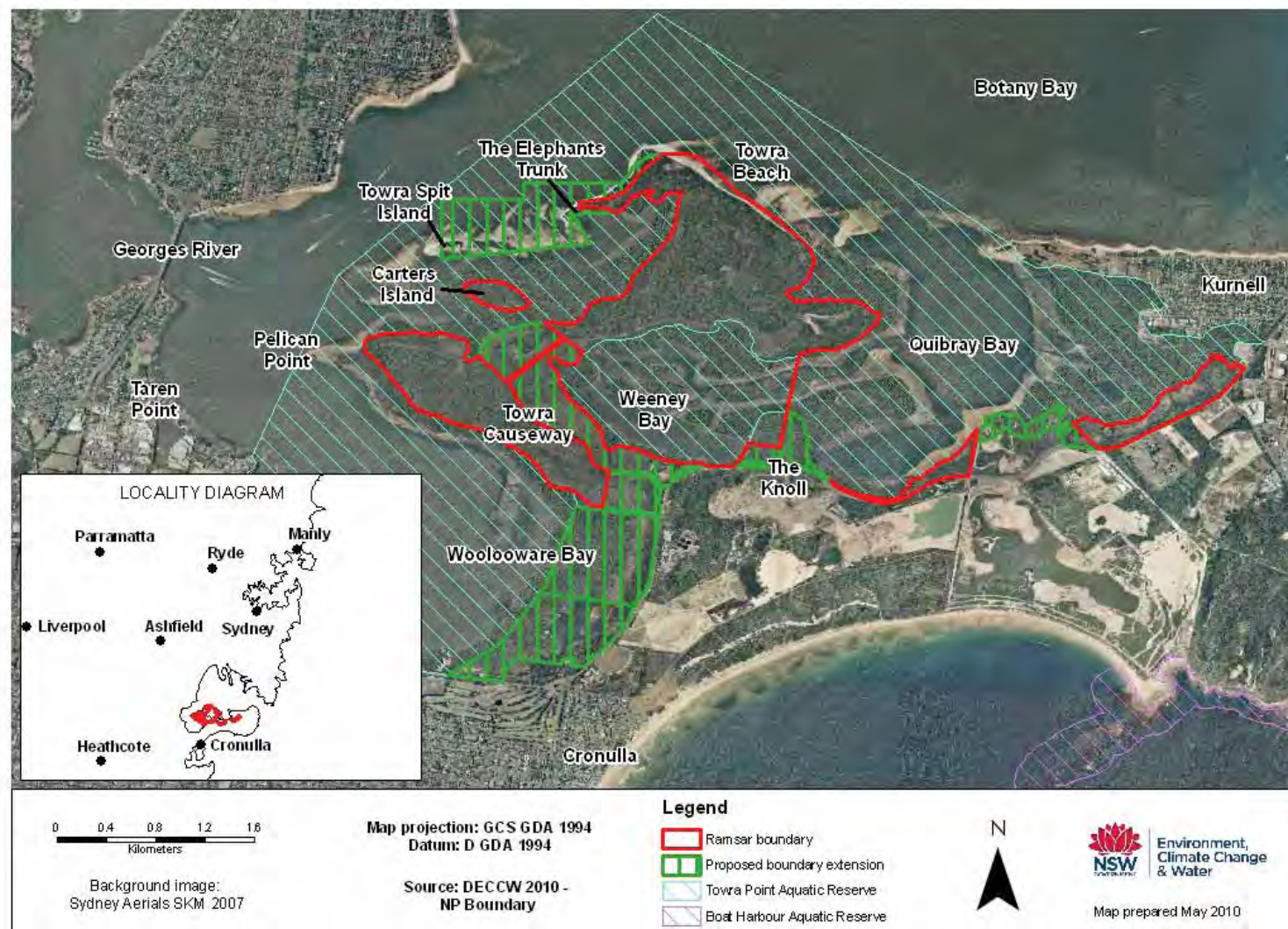


Figure 6: Towra Point Ramsar site and aquatic reserve

6.5 Riparian Setback – Incursions and Offsets

The various government agencies (DPI Water, DPI Fisheries, OEH and DP&E), along with Sutherland Shire Council, were involved in the approval of the *Woollooware Bay Town Centre Concept Plan* – which included *inter alia* the provision of an approved *Landscape Plan* for the Woollooware Bay Foreshore Park (see Appendix D).

Subsequently, the proponent (Bluestone Capital) prepared a Section 75W Amendment proposal for the Foreshore Park (dated November 2015) – which has been reviewed by Council and the government agencies. In response to comments on the previous Section 75W Amendment proposal (in early 2016), an amended Section 75W Amendment proposal has been prepared (Appendix A) – through a collaborative process involving several consultants on the project.

The amended Woollooware Bay Foreshore Park proposal (Appendix A) has the following physical characteristics with respect to native vegetation.

- A band of saltmarsh and other native riparian and associated vegetation of variable width along the ‘inner’ 20m strip of the Riparian Zone (as measured from the MHWL)
- The band is 20-30m wide in the Eastern and Western Park areas
- In the Eastern Park – the band contains a stormwater bioretention basin and swale – which are to be planted with native species
- Additional mass plantings on embankments within the ‘outer’ 20m strip of the Riparian Zone (as measured from the MHWL) – again in the Eastern and Western Park areas
- Further additional mass plantings on embankments beyond the ‘outer’ 20m strip of the Riparian Zone (as measured from the MHWL) – in the Western Park area
- Additional plantings of saltmarsh and other native riparian and associated vegetation along the Channel (*ie* beyond the Riparian Zone to the south – towards Captain Cook Drive)

The additional plantings beyond the 40m Riparian Zone, including along the Channel to the south, provide an ‘Offset’ for the incursions into the Riparian Zone that are identified in the *Woollooware Bay Foreshore Park Landscape Plan* (Appendix A).

The amended Woollooware Bay Foreshore Park proposal (Appendix A) will involve the following incursions into the 40m Riparian Zone.

- Small areas of turf - for play and recreation
- A small dedicated playground for children – in front of the approved residential development being constructed by Bluestone Capital
- Shared paths, seating and small barbeque areas – most of which are located outside the inner 20m Riparian Zone
- It is noted that the pathway/service road extending north from the western side of the Channel into the Western Park area is a requirement of AusGrid – to service the power poles at this location

The Family Hill area is a separate matter. This area has long been a substantial mound of fill material, with planted trees and a largely unmanaged batter slope down (to the north) to the edge of the mangroves. The

southern batter of Family Hill slopes down towards the Sharks Park stadium, and has long been used as part of the viewing area for games at the stadium. This slope is not part of the current Section 75W Amendment application.

The amended Woollooware Bay Foreshore Park project proposes to undertake substantial remedial works on Family Hill – but relevantly only on the outer (northern) batter slope. This area is to be re-contoured, stabilised and planted with native species, with a shared path to be provided at the top of the slope (above the mangroves and the new plantings).

It is neither feasible nor appropriate to require a 40m Riparian Zone at this location – given the elevations and slopes involved, and the existing and intended ongoing use of the Family Hill slope towards the stadium for the viewing of football games.

The total area of all native plantings within the proposed Woollooware Bay Foreshore Park is approximately 1.9ha – compared with the virtual absence of any native vegetation within the Park footprint at present.

Whilst that area is slightly less than the approximate area of the Riparian Zone across the subject site (40m x 520m = 2ha¹ approximately), the following matters should be taken into account.

- There is virtually no native vegetation within the footprint of the proposed Woollooware Bay Foreshore Park at present. The provision of approximately 1.9ha of native vegetation is a substantial and significant improvement
- There is currently no appropriately managed Riparian Zone within the Woollooware Bay Foreshore Park footprint
- The Woollooware Bay Foreshore Park will provide a properly managed Riparian Zone substantially greater than at any other location along the whole of the Woollooware Bay foreshore – either now or at any foreseeable time in the future
- The goals and objectives of the various statutes and government agencies will be achieved in the Woollooware Bay Foreshore Park – with respect to improved water quality outcomes; increased areas of terrestrial habitat; increased physical protection for the mangroves and the fauna that use mangroves; increased areas of saltmarsh
- It cannot reasonably be a requirement that the area of Family Hill – which currently and for a long time has been used for families to watch games in the stadium – be rehabilitated as riparian vegetation. This area slopes in the wrong direction, in any case; and is beyond the scope of this project

On the basis of all of the considerations detailed above, the current amended design for the Woollooware Bay Foreshore Park (Habit8 – see Appendix A) is appropriate and reasonable; and satisfactorily achieves the objectives of the relevant statutes and environmental planning instruments.

¹ It needs to be noted that the Central Park area does not extend for the full 40m width of the riparian corridor – as only the outer (northern) slope of Family Hill is included in the Park. Therefore – the actual area of the riparian zone within the proposed Woollooware Bay Foreshore Park is approximately 1.8ha.

6.6 Comparison with Approved Plans

A comparison of the current proposed Woollooware Bay Foreshore Park (as documented in Appendix A) with the existing approved plan for the Foreshore Park (Appendix C) is most illuminating.

The approved plan (see Appendix C) has the following general characteristics.

- A generally 30m wide planted Riparian Zone along the Eastern and Western Park
- Shared paths and boardwalks - within 0m to 15m of the mangroves in the Eastern Park
- No complementary or supplementary native plantings beyond the 30m line
- A small area of possible saltmarsh plantings confined to the Western Park – “*subject to further investigation*”
- Rehabilitation of the northern slope on Family Hill (down to the mangroves) – but:
 - in a much more formal manner than is currently proposed – with gabion walls and paths
 - with a boardwalk immediately adjacent to the mangroves at the base of the slope
 - with no saltmarsh plantings
- Minimal supplementary native plantings along the Channel

As noted above, this plan (dated 27/08/2012) has been approved by DP&E with the ‘concurrence’ of the relevant agencies (DPI Water, DPI Fisheries, OEH, Council).

By contrast, the proposed amended Woollooware Bay Foreshore Park (as documented in Appendix A) has the following characteristics.

- A minimum 20m wide planted Riparian Zone along the Eastern and Western Park
- Additional areas of native riparian and other appropriate vegetation from 20 to ~50m from the MHWL – approximately 1.9ha *in toto* (see Chapter 6.2)
- Shared paths and boardwalks – a minimum of 20m from the mangroves in the Eastern and Western Park (except where required by AusGrid or unavoidable to link with Family Hill)
- A commitment to substantial saltmarsh plantings along the full length of the Foreshore Park where possible - given physical circumstances
- Rehabilitation of the northern slope on Family Hill (down to the mangroves) –
 - in a much more informal and natural manner than that already approved
 - with no gabion walls or paths within this slope
 - with saltmarsh plantings at the base of the slope
- Significant supplementary native plantings along the Channel

Given those considerations – the current proposed amended Woollooware Bay Foreshore Park (as documented in Appendix A) is a **significant** improvement on the existing approved plan for the Foreshore Park that has already been accepted by the various government agencies.

There cannot reasonably be any justification for any opposition to the current proposal – given the acceptance of the previous (less ambitious and less generous) design for the Park.

6.7 Comparison with Previous Section 75W Proposal

In addition to being a **significant** improvement over the existing approved plan for the Foreshore Park (see above), the current proposed amended Woollooware Bay Foreshore Park (as documented in Appendix A) is an improvement over the previous Section 75W proposal (Appendix C).

The current proposal has sought to address all of the issues raised by the various government agencies with respect to the previous Section 75W proposal.

The current amended Woollooware Bay Foreshore Park Section 75W proposal (Appendix A) includes the following improvements on the previous Section 75W proposal (see Appendix C).

- The removal of all infrastructure from the CRZ in the Western Park - except that required by AusGrid (for transmission line maintenance)
- The removal of all infrastructure from the CRZ in the Eastern Park - except for a narrow sliver required for disabled access to the top of Family Hill
- The removal of all infrastructure from the northern slope of Family Hill (including the replacement of gabion walls with the less formal treatment of the slope and removal of the previous mangrove boardwalk around the base of the slope)
- A significant increase in the extent of saltmarsh plantings
- Increased supplementary native plantings along the Channel, including of saltmarsh
- An exceedance of the offset requirements to satisfy the 'averaging rule' of DPI Water (see Chapter 7)

As noted above, the current proposed amended Woollooware Bay Foreshore Park (as documented in Appendix A) has sought to address the issues raised by the various government agencies (DPI Water, DPI Fisheries, OEH, Council, DP&E) with respect to the previous Section 75W proposal (see Appendix C).

7 WATER MANAGEMENT ACT CONSIDERATIONS

7.1 The Statutory Regime

The *Water Management Act 2000* defines “waterfront land” relevantly as:

“the bed of any estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the estuary”.

The “prescribed distance” is defined in the *Water Management Act* as (relevantly) “40 metres”.

There is no definition in the Act of “the mean high water mark of the estuary”; although it is assumed that the ‘Mean High Water Mark’ (MHW), as provided in the mapping of Sutherland Shire Council, is the relevant measure (whether or not that line is the actual “mean high water mark of the estuary”).

Activities on “waterfront land” (ie within 40m of the “mean high water mark of the estuary”) may require a *Controlled Activity Approval* (CAA) from the NSW Department of Primary Industries – Water (DPI Water).

7.2 Relevance of the Subject Site

The proposed Woollooware Bay Foreshore Park is located substantially within the “waterfront land” adjacent to the Woollooware Bay foreshore - as defined in the *Water Management Act 2000* – on the subject land at Woollooware (see Figure 1 above and the details in Appendix A).

Relevant matters which need to be taken into account in any consideration of the Woollooware Bay Foreshore Park proposal are as follows.

- Most of the Woollooware Bay Foreshore Park footprint is located within the easement for the major electricity transmission lines which skirt the southern side of Woollooware Bay. As a consequence, the nature and types of activities which are permissible (including riparian revegetation) are restricted in some places.
- Most of the Western Park area is currently (or was until recently) turfed playing fields – with no ecological value or relevance; and with no appropriate water quality or weed controls or management. This area is currently being used for the storage of fill material for the adjoining residential development to the immediate south.
- Essentially all of the Eastern Park area is currently, and has for a long time been, an asphalt carpark – of no ecological value at all. And with unmanaged stormwater discharges as well as uncontrolled vehicular movements (lights and noise) until the late evening.
- Essentially all of the Central Park area consists now, and has for some considerable period consisted, of a very large mound of fill material associated with the Cronulla Sharks stadium. There is essentially at present no relevant management or treatment of the northern slope from the Family Hill into the mangroves.

None of the area to be occupied by the Woollooware Bay Foreshore Park has been the subject of any appropriate or suitable management measures over a very long period. Nevertheless, as noted by DPI Fisheries - “the mangrove forest in Towra Point Aquatic Reserve adjacent to this site is **mostly in excellent condition**” (emphasis added).

The proposed Woollooware Bay Foreshore Park project, as detailed in Appendix A, will provide a very substantial and significant improvement to the environmental features of the area generally, and particularly to the footprint to be occupied by the Foreshore Park.

The proposal includes a significant array of major environmental benefits, including the following.

- The removal of significant areas of inappropriate features and uses (turfed areas, asphalt carparks, fill material)
- The re-contouring of many parts of the footprint – to provide more appropriate landforms
- The removal of some areas of imported fill material
- The planting of native riparian vegetation over large swathes of the Park footprint
- The provision of stormwater treatment features – which will also provide native habitat and resources for an array of native fauna
- A substantial increase in the extent of saltmarsh vegetation
- An array of social benefits – including improved education of the general public regarding the values of native vegetation and biota, and the adverse impacts of some thoughtless urban actions (littering, uncontrolled pets *etc*)

As also discussed above (in Chapter 6.5), the current proposed Woollooware Bay Foreshore Park project (as detailed in Appendix A) is a **significant** improvement over the currently approved plan for the Park (Appendix C) – which was ‘signed off’ *inter alia* by DPI Water in 2012.

7.3 Consistency with DPI Water Guidelines

The DPI Water *Policy* and *Guidelines* with respect to riparian zones specify the following characteristics.

- The ‘*Critical Riparian Zone*’ (CRZ) occupies the inner 50% of the total Riparian Zone for any relevant land – in this instance being the 20m of the 40m Riparian Zone closest to Woollooware Bay and the mangroves
- According to the *Policy* and *Guidelines* of DPI Water – the CRZ must be ‘fully’ vegetated with appropriate riparian vegetation (from saltmarsh and/or wetlands through to riparian forest)
- Most other activities are not ‘permitted’ - notwithstanding the existing circumstances and condition of the CRZ (in this instance, including existing fill material, turfed playing fields, temporary waste deposits, and asphalt carparks)
- The ‘*Outer Riparian Zone*’ (ORZ) is also (desirably) to be of riparian revegetation or rehabilitation; but allows for incursions (up to the extent of the CRZ) – so long as these incursions can be offset beyond the Riparian Zone (the so-called ‘averaging rule’)

The current proposed Woollooware Bay Foreshore Park project (as detailed in Appendix A) substantially satisfies and/or exceeds the ‘requirements’ of the DPI Water *Policy* and *Guidelines* with respect to riparian zones; with a few relatively minor (and ecologically irrelevant) exceptions.

As noted above, it is particularly relevant in this instance to consider the nature and (marginal at best) condition of the foreshore treatments of lands to the east and west of the subject site; and the fact that the subject site is currently characterised by existing fill material, turfed playing fields, temporary waste deposits, and asphalt carparks.

In this regard, the current proposed Woollooware Bay Foreshore Park project has the following relevant characteristics (see details in Appendix A).

- Western Park - the CRZ consists of riparian plantings and saltmarsh; except for a minor incursion at the eastern end (for an access path required by AusGrid for maintenance of the overhead transmission lines)
- A turf area and childrens playground, and access paths and other facilities, in the outer riparian area of the Western Park – which are offset in part by areas of ‘upper riparian plantings’ beyond the 40m riparian zone
- Significant improvements to the CRZ in the Central Park (which is currently an unmanaged fill slope); with some necessary access features (the proposed pedestrian pathway to replace the existing unformed access)
- A major rehabilitation of the existing unmanaged fill slope in the Central Park down to the mangroves – with riparian and saltmarsh plantings
- Eastern Park - the CRZ consists predominantly of native swale plantings, riparian plantings and saltmarsh; except for a minor incursion for part of an access path for disabled persons and the rehabilitated/reconstructed mangrove boardwalk
- A variety of public access and recreational facilities, in the outer riparian area of the Western Park – which are offset by areas of riparian and saltmarsh plantings within the Channel area
- Although beyond the ‘statutory’ Riparian Zone, the Channel element of the Foreshore Park includes substantial areas of riparian and saltmarsh plantings – which in part provide an offset for the incursions into the Riparian Zone in the Eastern and Western Park areas

In overall terms, the relevant areas are as follows.

- Approximately 1ha of CRZ – currently mostly playing fields, unmanaged fill and asphalt carparks (noting that part of the CRZ on Family Hill is beyond the scope of this project)
- Approximately 2ha of riparian and/or other native plantings – to replace the existing playing fields, areas of managed and unmanaged fill, and asphalt carparks

From an ecological perspective, and putting aside any proscriptive or formulaic ‘requirements’, the current proposed Woollooware Bay Foreshore Park project (see details in Appendix A), provides an outstanding ecological and environmental benefit at this location.

8 SECTION 5A CONSIDERATIONS

The proposed Woollooware Bay Foreshore Park will have no adverse impact upon any ‘*threatened species, populations or ecological communities, or their habitats*’ - as listed in the *Threatened Species Conservation Act 1995* (TSC Act).

The area to be occupied by the Woollooware Bay Foreshore Park is characterised almost exclusively by fill material, weeds, turfed fields, structures and asphalt. There are currently no threatened biota or their habitats within the footprint (with the possible exception of occasional individuals of highly mobile and wide-ranging fauna species). In addition, there is currently no protection for and no active management of adjoining lands for the protection of the adjoining mangroves or tiny patches of saltmarsh.

The proposed Woollooware Bay Foreshore Park will alter that circumstance – for the (much) better.

Given the circumstances, the proposed Woollooware Bay Foreshore Park will impose no **direct** adverse impacts (or “*effects*”) on any threatened biota or their habitats.

Similarly, the proposed Woollooware Bay Foreshore Park will impose no **indirect** adverse impacts (or “*effects*”) on any threatened biota or their habitats.

Indeed, the creation and management of the Woollooware Bay Foreshore Park will reduce indirect impacts, and will enhance and promote threatened biota and their habitats at this location. In this regard, the following considerations are pertinent.

- Mangrove forest – although not a threatened ecological community (TEC), it does provide habitat for an array of threatened species, including foraging habitat for the Grey-headed Flying Fox and microchiropteran bats, and roosting habitat for some threatened birds. The mangrove forest adjoining the subject land will benefit substantially from the Foreshore Park project – by the provision of buffering vegetation and ongoing active management, and by improved water quality discharges.
- Coastal Saltmarsh – is a threatened ecological community (TEC) and habitat for the White-fronted Chat (a threatened species listed in the TSC Act which occurs *inter alia* in saltmarsh vegetation on Towra Point). Any existing (miniscule) areas of this TEC will be retained, and **substantial** additional areas are to be created. This TEC will also benefit substantially from the Foreshore Park project – by the provision of buffering vegetation and ongoing active management, and by improved water quality discharges.
- Grey-headed Flying Fox and microchiropteran bats – additional foraging habitat for these species will be provided in the extensive replanting of the Foreshore Park.
- Threatened birds – there are a number of threatened bird species that use mangrove forest as habitat. The improved circumstances for the mangroves lining Woollooware Bay that will accrue because of the Foreshore Park may benefit some of those species.

Consideration of the relevant factors of Section 5A of the EP&A Act in respect of the proposed Woollooware Bay Foreshore Park leads to the following assessment.

- There is no likelihood that a “*viable local population*” of any threatened species would be placed “*at risk of extinction*” (emphasis added) as a consequence of the proposed establishment of the Woollooware Bay Foreshore Park. Indeed, any likely or possible threatened species will benefit from the project – Factor (a).

- There is no “*endangered population*” of any relevance, or even potential relevance, to the Woollooware Bay Foreshore Park - Factor (b).
- The only “*threatened ecological community*” (TEC) present on or adjacent to the Woollooware Bay Foreshore Park is the Coastal Saltmarsh TEC. The existing (miniscule) areas of this TEC within or adjacent to the Foreshore Park will be retained, and substantial additional areas are to be created (see Appendix A). This TEC will benefit substantially from the Foreshore Park project - Factor (c).
- No habitat for any threatened biota is to be removed or modified for the Woollooware Bay Foreshore Park – rather habitat is to be created. There will be no reduction in habitat connectivity – indeed any such connectivity will be enhanced. And the habitat present cannot be regarded as important for the survival of any threatened biota. The proposed Woollooware Bay Foreshore Park will not reduce or otherwise adversely affect any habitat of relevance for any “*threatened species, populations or ecological communities*” (in contrast, it will enhance habitat for any such species) - Factor (d).
- There is no “*critical habitat*” for any even potential threatened biota present in the Woollooware Bay Foreshore Park - Factor (e).
- The development of the Woollooware Bay Foreshore Park would not contravene the goals or desired outcomes of any *Recovery Plans* or *Threat Abatement Plans* for any threatened biota present or likely to occur - Factor (f).
- The development of the Woollooware Bay Foreshore Park will not involve the imposition of any “*key threatened processes*” - Factor (g).

There is no likelihood or indeed even possibility that the establishment of the Woollooware Bay Foreshore Park (as proposed in Appendix A) would constitute a “*significant effect*” with respect to any “*threatened species, populations or ecological communities, or their habitats*” - pursuant to the relevant considerations in Section 5A of the EP&A Act.

Indeed, the proposed Woollooware Bay Foreshore Park will enhance the circumstances for any potential or likely threatened biota (“*threatened species, populations or ecological communities, or their habitats*”) at this location. The proposal will enhance the mangrove habitats (by increased protection, buffering and improved discharges), and will substantially increase the areas of native vegetation at this location.

9 EPBC ACT CONSIDERATIONS

The Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) requires consideration of the potential for a “*significant impact*” to be imposed by an activity on a *Matter of National Environmental Significance* (MNES).

In the event that such an “*impact*” is “*likely*” to be imposed, the activity proposed must be referred to the Commonwealth for determination as to whether it constitutes a “*controlled action*”. Where a development activity does constitute a “*controlled action*”, an approval from the Commonwealth Minister of the Environment is required.

The establishment of the Woollooware Bay Foreshore Park has no potential to affect any MNES (even theoretically) other than -

- listed threatened species and ecological communities; and/or
- migratory species.

As discussed above with respect to the TSC Act, there are no habitats and resources of relevance to “*threatened species*”, or any (allegedly) “*migratory species*”, within the footprint of the proposed Woollooware Bay Foreshore Park. The adjoining mangrove forests do, however, provide some habitat for several such species.

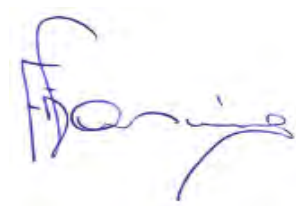
As also discussed above with respect to the TSC Act, the proposed Woollooware Bay Foreshore Park will increase the extent and distribution of, and will enhance and improve the protection of, any such habitats and resources.

There is no potential for a “*significant impact*”, nor indeed for any adverse impact, to be imposed upon any threatened biota as a consequence of the establishment of the proposed Woollooware Bay Foreshore Park. Indeed, any threatened and/or migratory species in the area will benefit from the establishment of the proposed Woollooware Bay Foreshore Park.

9 CONCLUSIONS

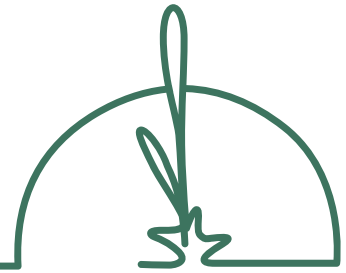
The current proposed Woollooware Bay Foreshore Park (as detailed in Appendix A) -

- Will provide almost 2 hectares of native vegetation and plantings where currently there are weeds, fill material and asphalt carparks
- Exceeds the requirements for riparian offsets as established by DPI Water pursuant to the 'averaging rule' for incursions into Riparian Zones
- Has removed all but minor and/or required items of infrastructure and artificial features from the Critical Riparian Zone (the 20m closest to the mangroves) in most of the Park
- Provides for significant saltmarsh plantings
- Has addressed, and substantially resolved, the issues raised by government agencies with respect to the previous (2015) Section 75W proposal for the Foreshore Park
- Constitutes a significant improvement over the Concept Plan which was approved by DPI Water, DPI Fisheries, OEH, Council and DP&E in 2012
- Will provide a significant and substantial environmental and ecological benefit for the adjoining mangroves and the biota that utilises that habitat, as well as for other native biota (by the creation of new habitats) and the Towra Point Nature Reserve and Ramsar Wetland
- Will provide an outstanding environmental and social resource – with opportunities for improved human health, education and recreation; as well as improved environmental outcomes



F Dominic Fanning
Gunninah

gunninah



Woollooware Bay Town Centre
Foreshore Park

Section 75W Modification to Concept Plan

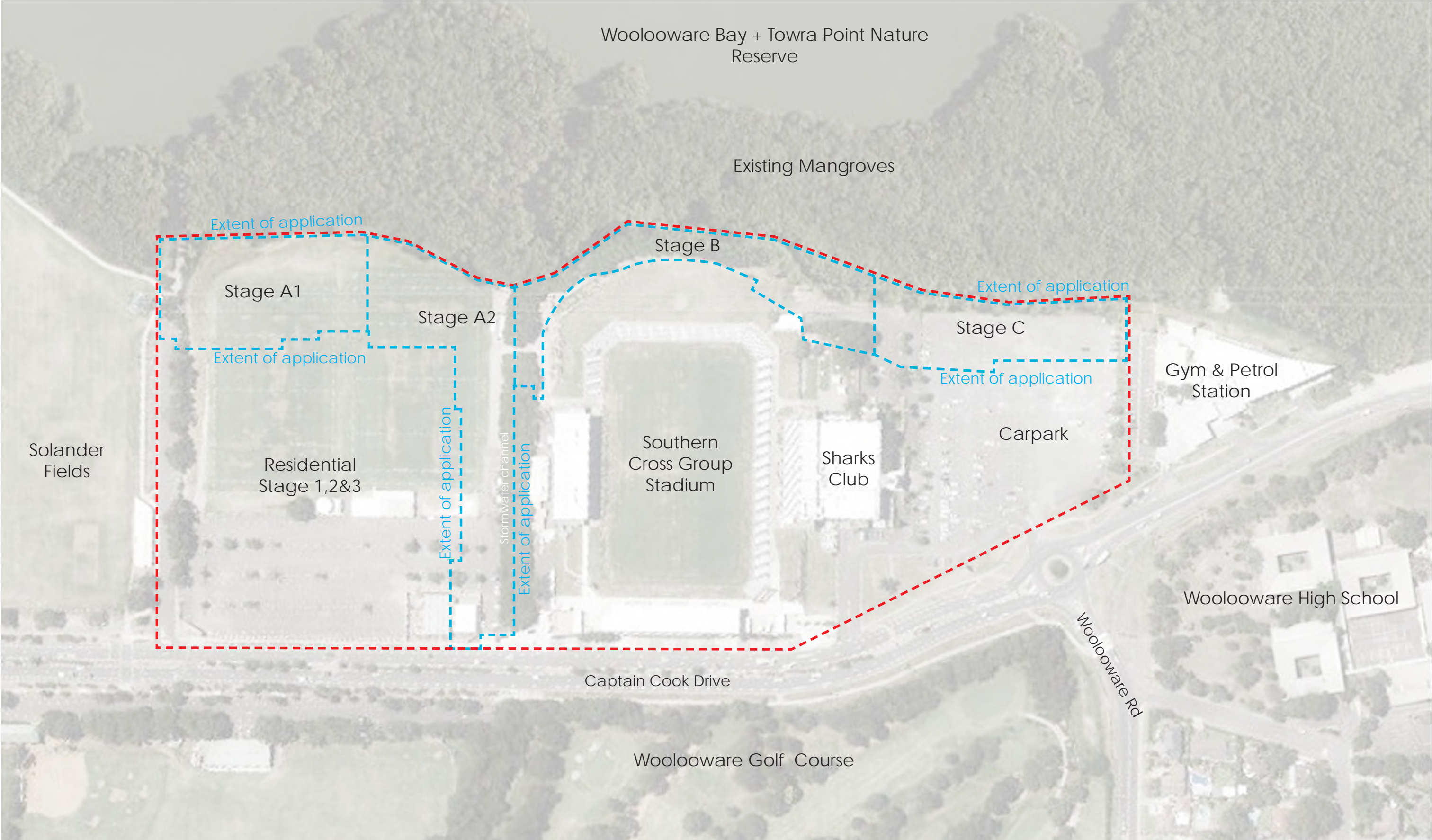
Ecological Impact Assessment Report

Appendix A
Landscape Plan and Design – Habit8

November 2016

Woollooware Bay Town Centre Foreshore Park - Section 75W

Project H8-16033
Rev. K
Date December 2016
ISSUE S75W Application

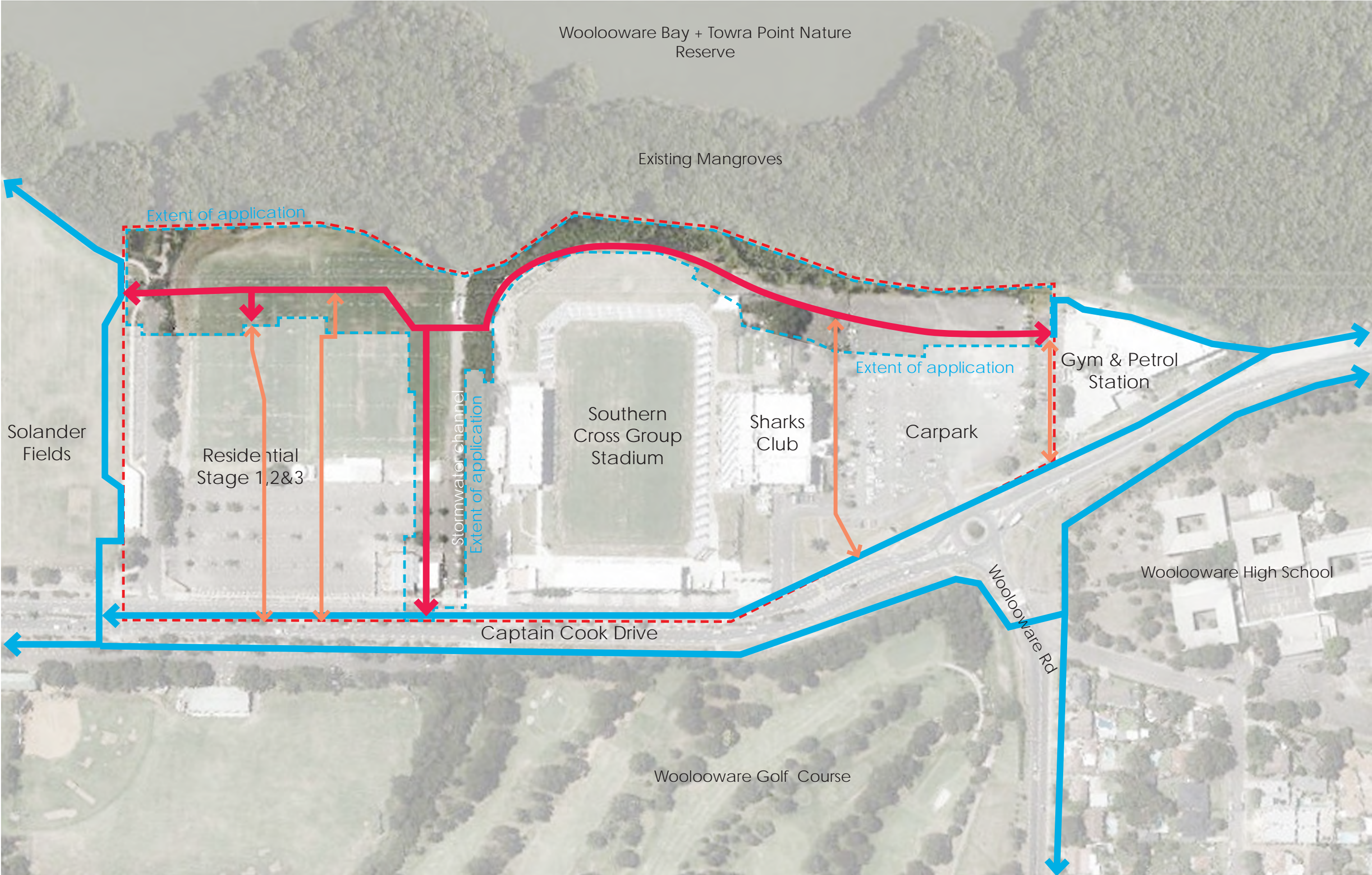


SITE PLAN

KEY

Extent of application

Site Boundary



ACCESS CIRCULATION

KEY

Extent of application

Site Boundary

Proposed vehicle/pedestrian/cycle shared coastal pathways,(Width 4.0m)

Proposed through - site links

Existing Shared pedestrian / cycle paths

EXISTING SITE IMAGES (Images referenced from Section 75W Report Revision A by Aspect Studios)



Existing power lines



Western playing fields and drainage channel



Existing mangrove water course



Retain existing mangroves



Existing mangrove boardwalk



Family Hill



Family Hill



The Southern Cross Group Stadium

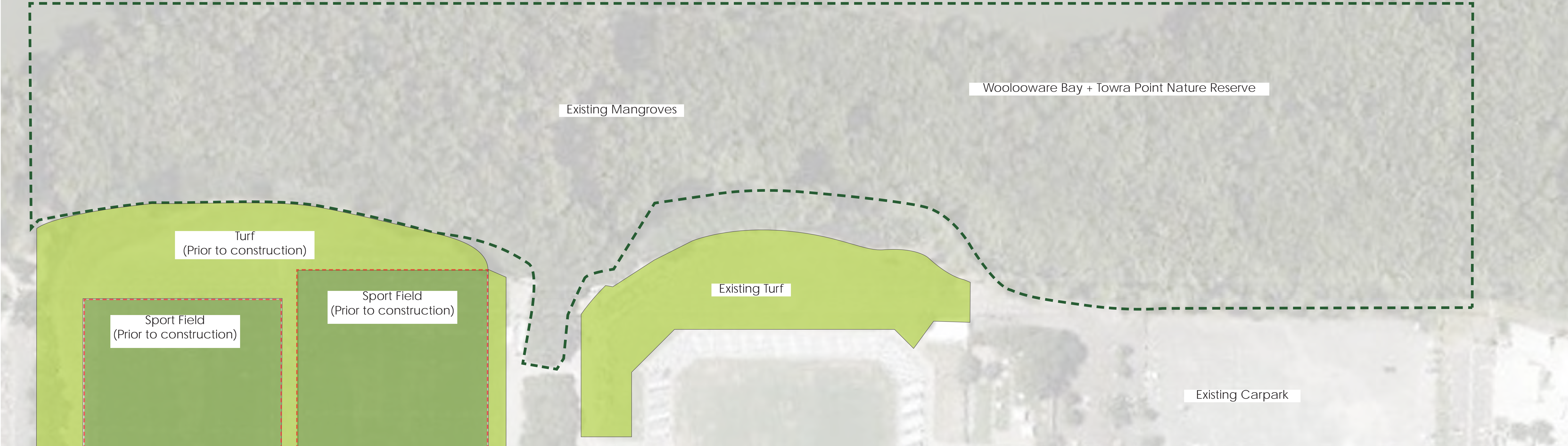


Existing trees along Family Hill



Existing Carpark





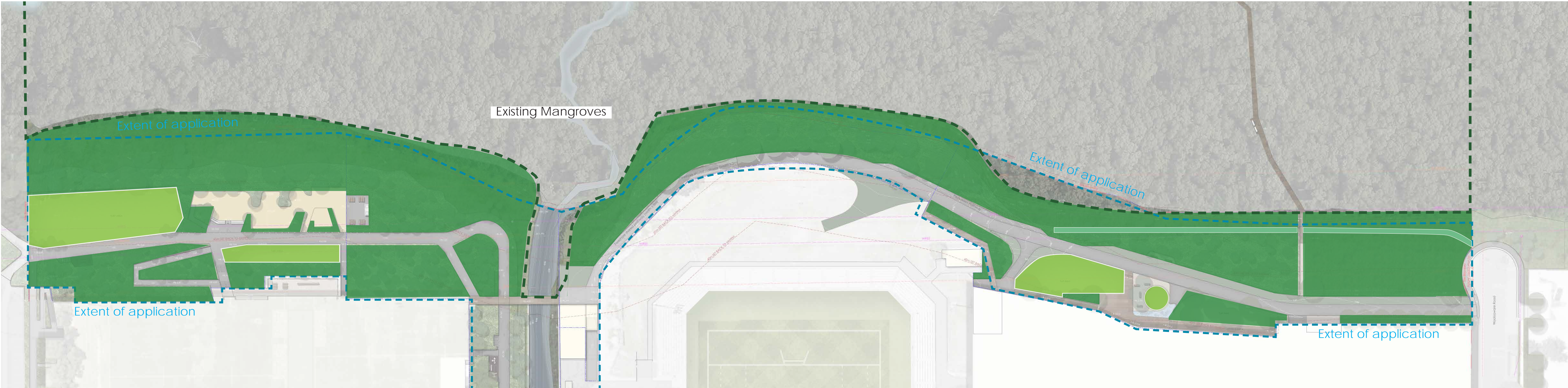
EXISTING MANGROVES AND TURF AREA

KEY

Existing Mangroves

Sport Field (Prior to construction)

Turf



PROPOSED PLANTING AND TURF AREA



KEY

Existing Mangroves

Proposed Riparian Planting

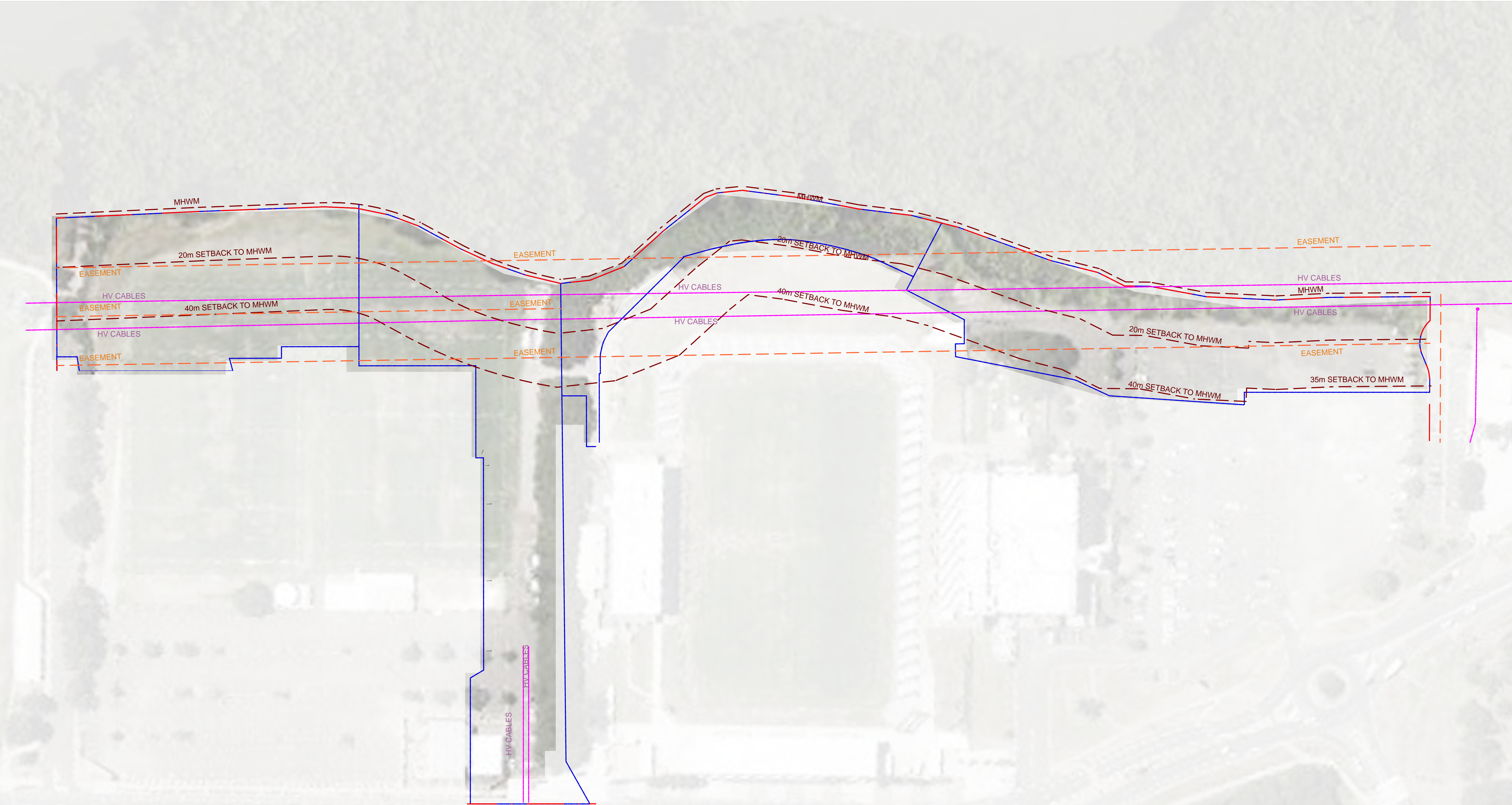
Proposed Turf

Proposed Swale

Client	Project	Project No.	Rev.	Drawn	Revision	Date	Purpose
	Woollooware Bay Town Centre	H8-16033	K	JZ	K	02.12.16	S75W Application
	Title	Drawing No.	Scale	Checked			
	Proposed Planting and Turf Area	L 003	N/A	DV			

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ABN: 19 164 285 250

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EXISTING AUSGRID EASEMENT CONDITION

KEY

<div></div> SITE BOUNDARY	<div></div> HV CABLES EASEMENT
<div></div> STAGE BOUNDARY	<div></div> MHWM
<div></div> HV CABLES	

Client	Project	Project No.	Rev.	Drawn	Revision	Date	Purpose
<div><div></div><div>CAPITAL BLUESTONE</div></div>	Woollooware Bay Town Centre	H8-16033	K	JZ	K	02.12.16	S75W Application
	Title	Drawing No.	Scale	Checked			
	Existing Ausgrid Easement Condition	L004	N/A	DV	<div></div>		

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LANDSCAPE MASTERPLAN

Client	Project	Project No.	Rev.	Drawn	Revision	Date	Purpose
CAPITAL BLUESTONE	Woollooware Bay Town Centre	H8-16033	K	JZ	K	02.12.16	S75W Application
	Title	Drawing No.	Scale	Checked			
	Landscape Masterplan	L005	1:800@A1	DV			

- KEY
- 01

Open turf area

02

Foreshore shared pathway (Width 4.0m)

03

BBQ and seating

04

Bridge across drainage channel

05

Existing Mangroves

06

Extended access road(Permeable paving for grass)

07

Fitness station

08

Touched By Olivia playground with range of accessible play equipment

09

Substation/Switch board

10

Gravel paving around Substation/Switch board

11

Drainage channel
- 12

Boardwalk/platform to building facade and through site link

13

Existing Trees to be retained

14

Public Toilet

15

Proposed Club Compound

16

1.8m Palisade fence

17

Grass on embankment

18

New mangrove timber boardwalk

19

Refer to planting schedule

20

Swale Planting Refer to planting schedule

21

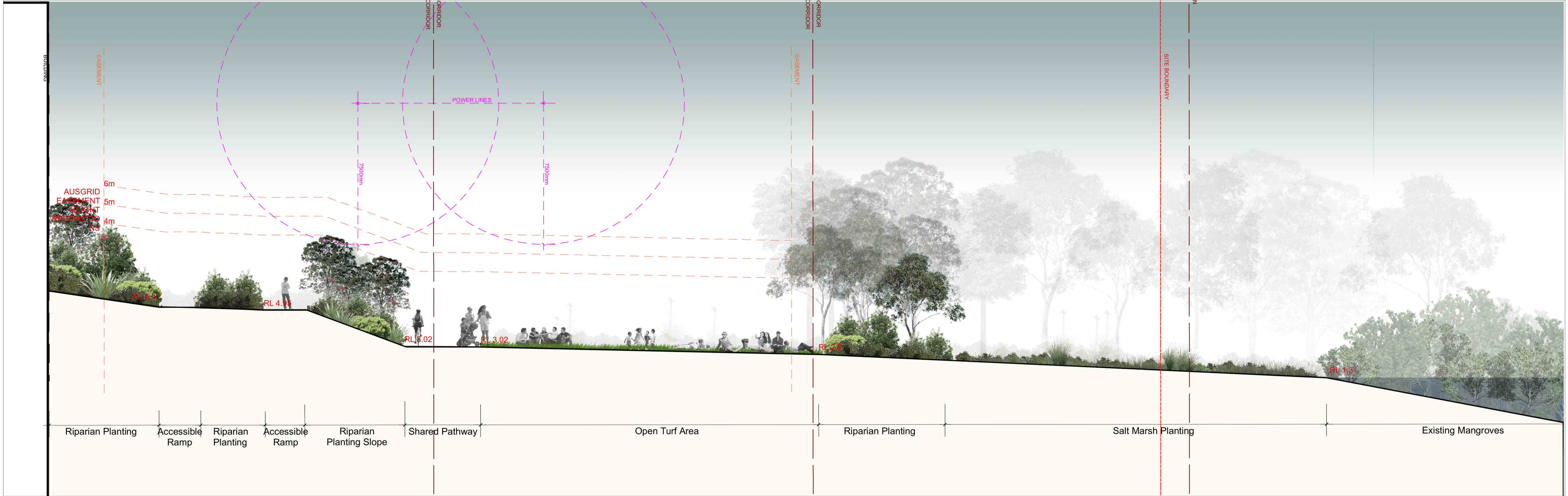
Lower Riparian Planting Refer to planting schedule

22

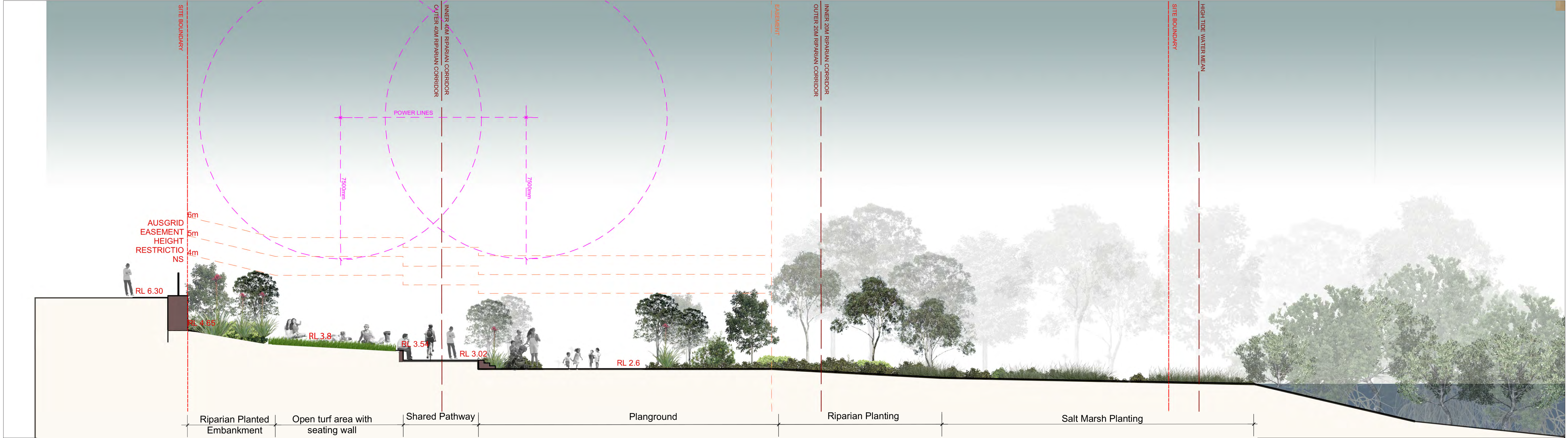
Upper Riparian Planting Outside Easement Refer to planting schedule

23


Upper Riparian Planting Inside Easement Refer to planting schedule

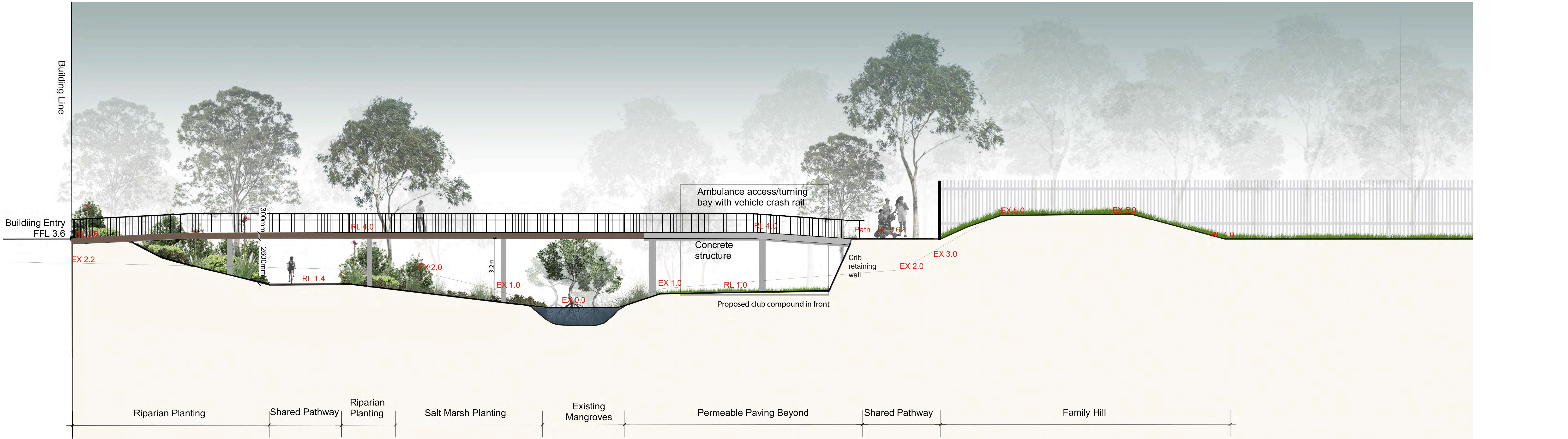



SECTION A

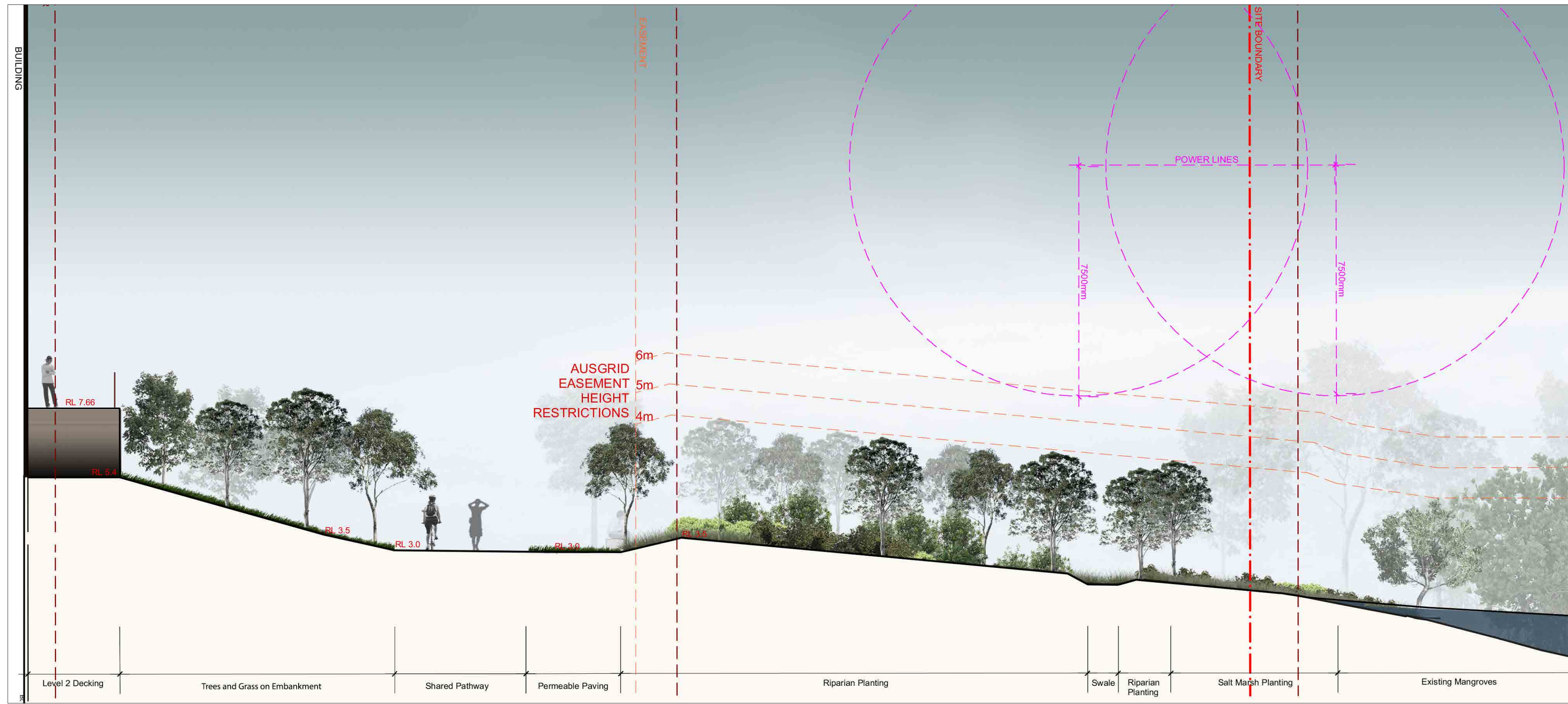


SECTION B

Client	Project	Project No.	Rev.	Drawn	Revision	Date	Purpose
	Woollooware Bay Town Centre	H8-16033	K	JZ	K	02.12.16	S75W Application
Title	Drawing No.	Scale	Checked				
Illustrative Sections	L006	N/A	DV				



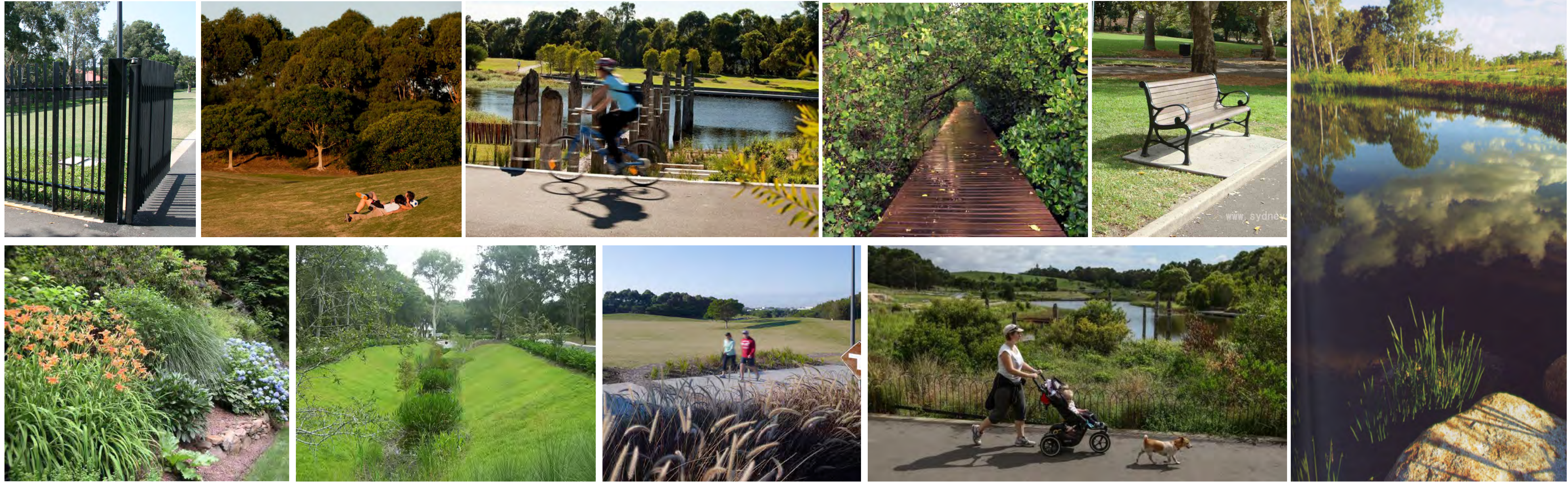
Client	Project	Project No.	Rev.	Drawn	Revision	Date	Purpose
	Woollooware Bay Town Centre	H8-16033	K	JZ	K	02.12.16	S75W Application
	Title	Drawing No.	Scale	Checked			
	Illustrative Sections	L007	N/A	DV			



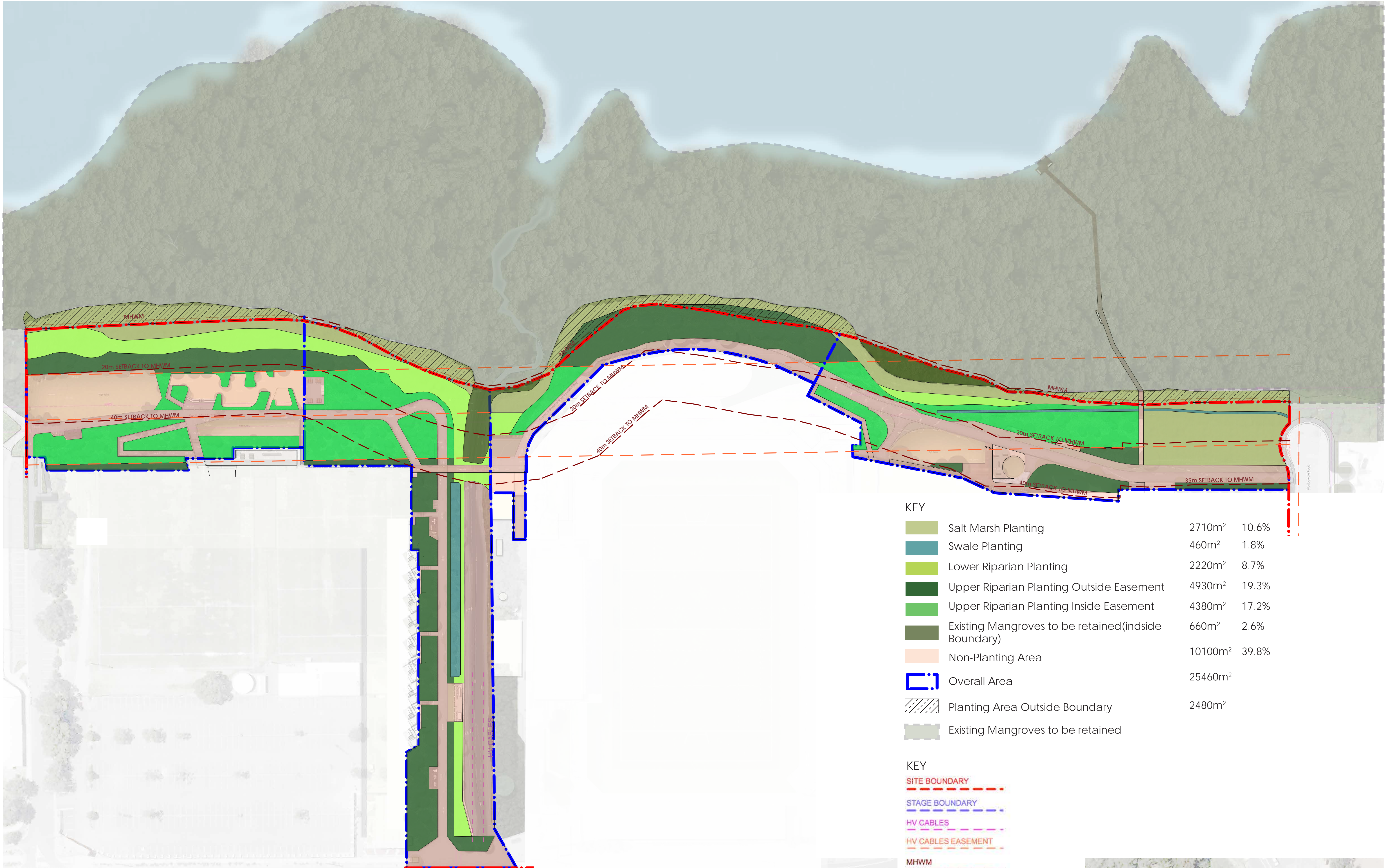
SECTION E



SECTION F



DESIGN IMAGES



KEY			
	Salt Marsh Planting	2710m ²	10.6%
	Swale Planting	460m ²	1.8%
	Lower Riparian Planting	2220m ²	8.7%
	Upper Riparian Planting Outside Easement	4930m ²	19.3%
	Upper Riparian Planting Inside Easement	4380m ²	17.2%
	Existing Mangroves to be retained(indside Boundary)	660m ²	2.6%
	Non-Planting Area	10100m ²	39.8%
	Overall Area	25460m ²	
	Planting Area Outside Boundary	2480m ²	
	Existing Mangroves to be retained		

KEY	
	SITE BOUNDARY
	STAGE BOUNDARY
	HV CABLES
	HV CABLES EASEMENT
	MHWM

Client	Project	Project No.	Rev.	Drawn	Revision	Date	Purpose
	Woollooware Bay Town Centre	H8-16033	K	JZ	K	02.12.16	S75W Application
	Title	Drawing No.	Scale	Checked			
	Indicative Planting Strategy Plan	L 009	N/A	DV			

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Salt Marsh Planting



Plant Schedule:

Botanic Name	Common Name
Groundcovers / Climbers	
<i>Samolus repens</i>	Creeping Brookweed
<i>Sarcocornia quinqueflora</i>	Samphire
<i>Selliera radicans</i>	Swampweed
<i>Suaeda australis</i>	Austral Seablite
<i>Tetragonia tetragonoides</i>	Native Spinach
<i>Zoysia macrantha</i>	Prickly Couch
Rushes / Grasses	
<i>Austrostipa stipoides</i>	Coastal Speargrass
<i>Baumea articulata</i>	Jointed Twig-rush
<i>Gahnia clarkei</i>	Tall Saw-sedge
<i>Juncus kraussii</i>	Sea Rush
<i>Sporobolus virginicus</i>	Saltwater Couch
<i>Triglochin striata</i>	Streaked Arrowgrass

Lower Riparian Planting



Plant Schedule:

Botanic Name	Common Name
Trees	
<i>Acmena smithii</i>	Lilly Pilly
<i>Alphitonia excelsa</i>	Red Ash
<i>Casuarina glauca</i>	Swamp Oak
<i>Cupaniopsis anacardioides</i>	Tuckeroo
<i>Eucalyptus robusta</i>	Swamp mahogany
<i>Glochidion ferdinandi</i>	Cheese Tree
<i>Melaleuca ericifolia</i>	Swamp Paperbark
<i>Melaleuca quinquenervia</i>	Broad Leaved Paperbark
<i>Melaleuca styphelioides</i>	Prickly Leaved Tea Tree
Rushes / Grasses	
<i>Baumea juncea</i>	Bare Twig Rush
<i>Carex appressa</i>	Tall Sedge
<i>Sporobolus virginicus</i>	Saltwater Couch
<i>Crinum pedunculatum</i>	Swamp Lily
<i>Dianella caerulea</i>	Blue Flax Lily
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass
<i>Isolepis inundata</i>	Swamp Club Sedge
<i>Juncus kraussii</i>	Sea Rush
<i>Juncus planifolius</i>	Broad Leaf Rush
<i>Juncus usitatus</i>	Common Rush
<i>Lomandra longifolia</i>	Ribbon Grass
<i>Oplismenus imbecillis</i>	Basket Grass
Ferns / Herbs	
<i>Blechnum indicum</i>	Swamp-water Fern
<i>Centella asiatica</i>	Centella
<i>Commelina cyanea</i>	Scurvy Weed
<i>Hypolepis muelleri</i>	Harsh Ground Fern
<i>Persicaria decipiens</i>	Slender Knotweed
Vines	
<i>Parsonsia straminea</i>	Common Silkpod
<i>Stephania japonica</i>	Snake Vine

Swale Planting



Plant Schedule:

Botanic Name	Common Name
Trees	
<i>Melaleuca ericifolia</i>	Swamp Paperbark
<i>Melaleuca quinquenervia</i>	Broad Leaf Paperbark
Rushes / Grasses	
<i>Baumea juncea</i>	Bare Twig Rush
<i>Carex appressa</i>	Tall Sedge
<i>Dianella caerulea</i>	Flax Lily
<i>Juncus kraussii</i>	Common Rush
<i>Juncus usitatus</i>	Sea Rush
<i>Lomandra longifolia</i>	Spiny Headed Mat Rush

Note:
All planting species selected are consistent with Coastal Saltmarsh, and Swamp Oak Floodplain Forest vegetation communities, and/or they are well represented in similar areas in the Kurnell peninsula

Planting images referenced from Section 75W Report Revision A by Aspect Studios)

Upper Riparian Planting Outside Easement



Plant Schedule:

Botanic Name	Common Name
Trees	
<i>Acmena smithii</i>	Lily Pilly
<i>Banksia marginata</i>	Silver Banksia
<i>Banksia serrata</i>	Saw Banksia
<i>Eucalyptus longifolia</i>	Woollybutt
<i>Eucalyptus robusta</i>	Swamp mahogany
<i>Ficus rubiginosa</i>	Rusty Fig
<i>Glochidion ferdinandi</i>	Cheese Tree
<i>Melaleuca ericifolia</i>	Swamp Paperbark
<i>Melaleuca linariifolia</i>	Snow-in-summer
Shrubs	
<i>Acacia longifolia - sophorae</i>	Coastal Wattle
<i>Banksia ericifolia</i>	Heath-leaved Bankis
<i>Banksia oblongifolia</i>	Fern-leaved Banksia
<i>Banksia spinulosa</i>	Hairpin Banksia
<i>Pittosporum revolutum</i>	Yellow pittosporum
<i>Melaleuca squamea</i>	swamp honey-myrtle
<i>Westringia fruticosa</i>	Coastal Rosemary
Groundcovers/Climbers	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Centella asiatica</i>	Centella
<i>Hardenbergia violacea</i>	Native sarsaparilla
<i>Pratia purpurascens</i>	White Root
<i>Stephania japonica</i>	Snake vine
Rushes / Grasses	
<i>Dianella caerulea</i>	Blue Flax Lily
<i>Dichelachne crinita</i>	Longhair plume grass

Upper Riparian Planting Inside Easement



Plant Schedule:

Botanic Name	Common Name
Trees	
<i>Callistemon citrinus</i>	Crimson Bottlebrush
<i>Leptospermum polygalifolium</i>	Common Tea Tree
<i>Melaleuca linariifolia (dwarf)</i>	Narrow-leaf Paperbark
<i>Melaleuca ericifolia (Sml)</i>	Swamp Paperbark
Shrubs	
<i>Acacia longifolia - sophorae</i>	Coastal Wattle
<i>Banksia ericifolia</i>	Heath-leaved Bankis
<i>Banksia oblongifolia</i>	Fern-leaved Banksia
<i>Banksia spinulosa</i>	Hairpin Banksia
<i>Pittosporum revolutum</i>	Yellow pittosporum
<i>Melaleuca squamea</i>	swamp honey-myrtle
<i>Westringia fruticosa</i>	Coastal Rosemary
Groundcovers/Climbers	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Centella asiatica</i>	Centella
<i>Hardenbergia violacea</i>	Native sarsaparilla
<i>Pratia purpurascens</i>	White Root
<i>Stephania japonica</i>	Snake vine
Rushes / Grasses	
<i>Dianella caerulea</i>	Blue Flax Lily
<i>Dichelachne crinita</i>	Longhair plume grass
<i>Juncus usitatus</i>	Common Rush
<i>Lomandra longifolia</i>	Spiny Head Mat Rush

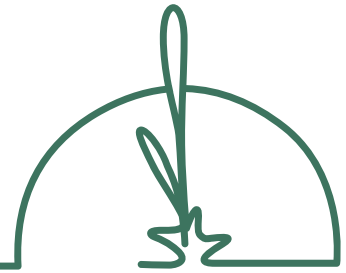
Note:
All planting species selected are consistent with Coastal Saltmarsh, and Swamp Oak Floodplain Forest vegetation communities, and/or they are well represented in similar areas in the Kurnell peninsula

Planting images referenced from Section 75W
Report Revision A by Aspect Studios)

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Woollooware Bay Town Centre
Foreshore Park

Section 75W Modification to Concept Plan

Ecological Impact Assessment Report

Appendix B
Photographs of the Subject Site and Woollooware Bay Foreshore

November 2016



Looking east from near the eastern edge of the proposed Woollooware Bay Foreshore Park.

The foreshore to the east of the proposed Park – mangroves at left; weeds; strip of Kikuyu; carpark and buildings at right. Native vegetation buffer to mangroves – non-existent. Distance between development and mangroves – 6 metres.

This is NOT what the Woollooware Bay Foreshore Park will look like.



Dense weeds at the interface between the existing development and the mangroves





The existing asphalt carpark at the Sharks Club site – the Eastern Portion of the proposed Woollooware Bay Foreshore Park.

The carpark is constructed on fill material, and has a partially unconsolidated slope down to the mangroves (left of picture) – with weeds in many places. There is no current active management of water quality discharged from the carpark into the mangroves.

The proposed Woollooware Bay Foreshore Park will replace the first 40 metres of this asphalt carpark with areas of native riparian vegetation, patches of managed grassland, and public recreation facilities – as illustrated below.



Courtesy - Aspect Studios



The existing mangrove boardwalk from the current Sharks carpark. Now in a state of disrepair, the proposal includes the re-instatement of this feature; as well as to create a number of additional boardwalks and observation platforms along the Foreshore Park – see below.



APPENDIX A Photographs along the Woollooware Bay foreshore



The existing Council mangrove boardwalk to the west of the proposed Woollooware Bay Foreshore Park





Mangroves at the end of the Council stormwater channel west of the Western Portion of the proposed Woollooware Bay Foreshore Park.

Note the significant mangrove sapling recruitment, despite minimal (any ?) stormwater quality management measures – demonstrating the resilience of this vegetation type.





Examples of inappropriate management of the Woollooware Bay foreshore – to the west of the proposed Woollooware Bay Foreshore Park.

These images identify precisely what is NOT proposed in the Foreshore Park on the subject land – extremely limited native vegetation; nil engagement with the community; marginal facilities; no enhancement of biodiversity

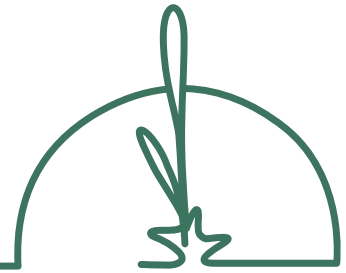




Notwithstanding the circumstances, there are high levels of mangrove seedling recruitment and no signs of decline in the mature mangroves – demonstrating both the resilience of this vegetation type and the lack of any requirement for significant ‘buffers’



gunninah



Woollooware Bay Town Centre
Foreshore Park

Section 75W Modification to Concept Plan

Ecological Impact Assessment Report

Appendix C
Previous and Current Designs

November 2016

Concept plan 1:750 [A1]



Key 1 New footpath and retained trees 2 Children's playground 3 BBQ facilities/ shade canopy 4 Open turf area 5 Elevated educational pontoon/ decks 6a Lower Foreshore Boardwalk 6b Lower Foreshore path 7 Residential streetscape 8 Residential private/ communal courtyards 9 Upgraded streetscape 10 21m wide zone containing planted swale / watercourse pathway link 11 Bank stabilisation / gabion wall terraces 12 Family Hill/ turf terraces 13 Upper Foreshore Path 14 Path link into Level 2 retail 15 Retail entries 16 Upgrade existing boardwalk 17 Informal sea wall 18 Vegetated riparian buffer / screening trees to retail loading dock 19 Vegetated riparian buffer to mangroves 20 Existing bridge connections

11017 Cronulla Sharks Redevelopment | Cronulla

ASPECT Studios

In collaboration with: TURNER ASSOCIATES

Scott Carver

Client: Bluestone Capital Ventures
No. 1 Pty Ltd

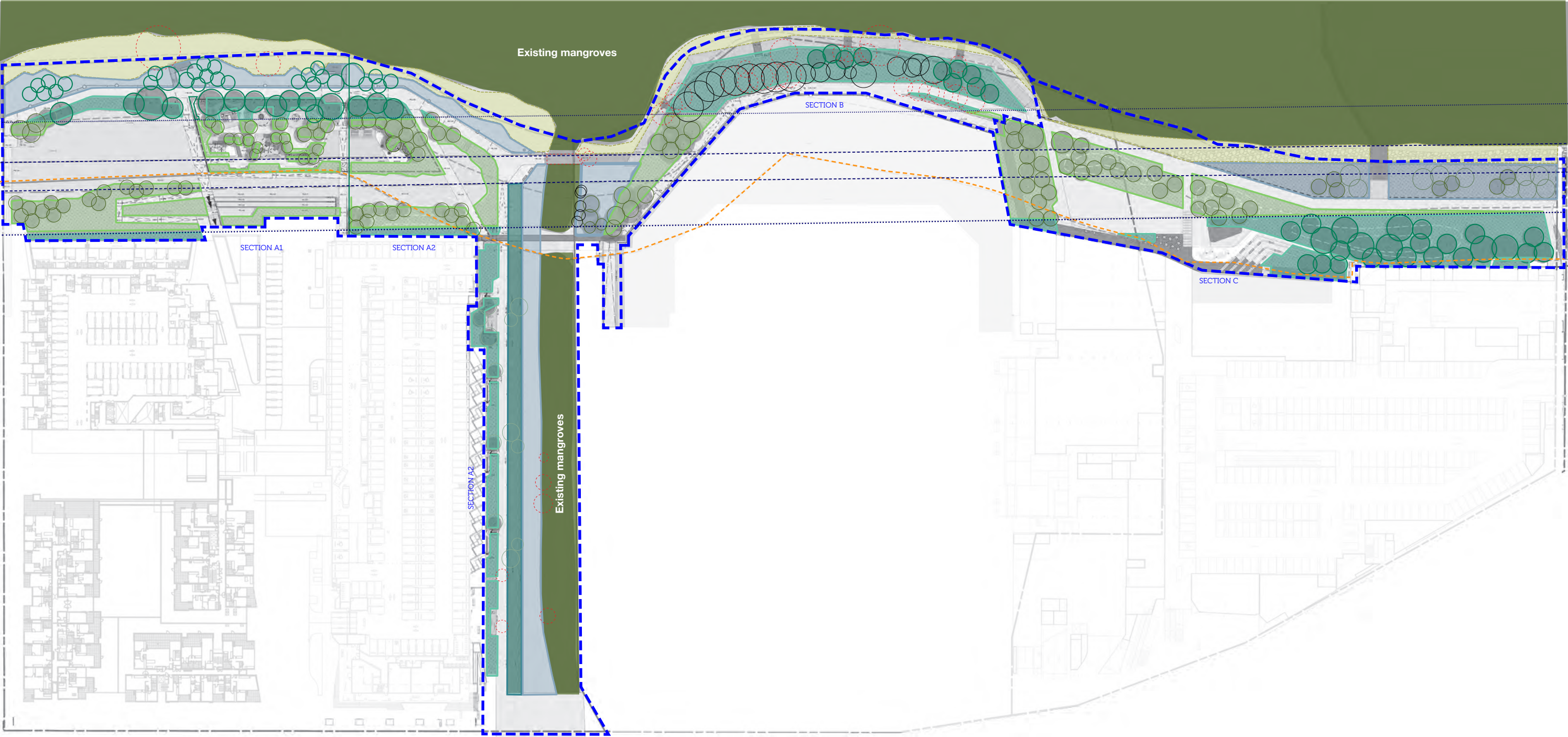
Drawn: JEM/ LN
Checked: SC

Date: March 2012

Dwg no.: 11017 - EA 02
Rev: B

Landscape concept plan | Environmental Assessment

Planting Community Zones:



Key:

- 40m Setback from MHWM
- Ausgrid HV cables
- Ausgrid HV cable easement

Note:
All planting species selected with ecologist
from VMP, Southernland Shire Council plant list
and Ausgrid approved easement plant list

Existing vegetation

- Existing trees to be retained
- Existing trees to be removed
- Existing mangroves to be retained
- Existing mangroves to be removed

Planting types

- Salt marsh planting
- Lower Riparian planting
- Swale planting
- Upper Riparian planting (outside HV cables)
- Upper Riparian planting (under HV cables)

Trees

- Proposed Trees (Outside HV Cables)
- Proposed Trees (Inside HV Cables)
- Foreshore Park Trees**
Outside HV Easement (large trees) = 44
Inside HV Easement (small trees) = 63
- Drainage Channel Trees**
Embankment and Swale = 12

- Mangrove Boardwalk Trees**
Outside HV Easement (large trees) = 10
Inside HV Easement (small trees) = 15
- Retail Foreshore Trees**
Outside HV Easement (large trees) = 24
Inside HV Easement (small trees) = 49

TOTAL TREES: 227





LANDSCAPE MASTERPLAN

Client	Project	Project No.	Rev.	Drawn	Revision	Date	Purpose
CAPITAL BLUESTONE	Woollooware Bay Town Centre	H8-16033	K	JZ	K	02.12.16	S75W Application
	Title	Drawing No.	Scale	Checked			
	Landscape Masterplan	L005	1:800@A1	DV			

- KEY
- 01 Open turf area
 - 02 Foreshore shared pathway (Width 4.0m)
 - 03 BBQ and seating
 - 04 Bridge across drainage channel
 - 05 Existing Mangroves
 - 06 Extended access road(Permeable paving for grass)
 - 07 Fitness station
 - 08 Touched By Olivia playground with range of accessible play equipment
 - 09 Substation/Switch board
 - 10 Gravel paving around Substation/Switch board
 - 11 Drainage channel
 - 12 Boardwalk/platform to building facade and through site link
 - 13 Existing Trees to be retained
 - 14 Public Toilet
 - 15 Proposed Club Compound
 - 16 1.8m Palisade fence
 - 17 Grass on embankment
 - 18 New mangrove timber boardwalk
 - 19 Refer to planting schedule
 - 20 Swale Planting Refer to planting schedule
 - 21 Lower Riparian Planting Refer to planting schedule
 - 22 Upper Riparian Planting Outside Easement Refer to planting schedule
 - 23 Upper Riparian Planting Inside Easement Refer to planting schedule