Ryde Riverwalk

Landscape Design Report Development Application

Bill Mitchell Park to Looking Glass Bay Park

November 2012
Revision A

Prepared for City of Ryde

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Contents

1. Introduction

1.1 The Ryde River Walk network

The Ryde Riverwalk is an 8km trail located alongside the northern edge of the Parramatta River in Gladesville.

The site scope formalises a 8km of existing informal trail along the coastal edge of Bill Mitchell Park, Glades Bay Park, and finally connecting to Looking Glass Bay Park.

It forms part of a regional river walk that follows existing trails and roads in Ryde from Wharf Road in the east to Punt Road in the west via a series of interconnected parks and reserves (see Ryde River Walk Master Plan, 2007).

The site area encompasses 3 of the 4 remaining park upgrades to complete the entire River walk Master plan (only Banjo Patterson Park on the western end remains)

The existing route is also well known to local bush walkers, and is listed on the 'Walking Coastal Sydney' website for the Walking Volunteers. Importantly, it forms part of a coastal walk that stretches from Woolwich to Parramatta, and traverses sites of Aboriginal and cultural history, ecological importance, and spectacular scenery.

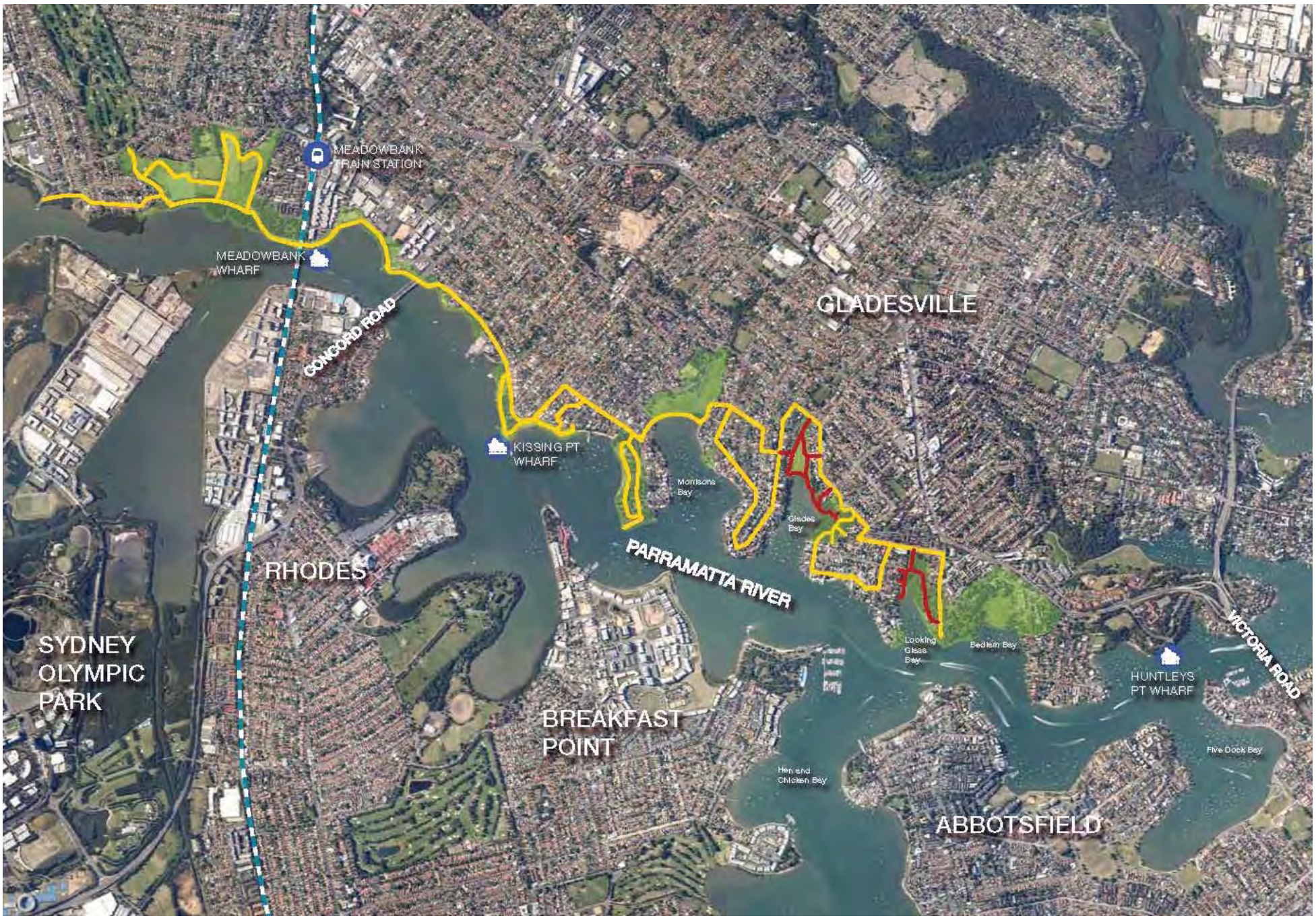


Figure 2: Regional Context Plan

1.2 Scope context

Public access to the site is best made via Sydney Ferries at either Kissing Pt Wharf or Huntley's Wharf. Whilst there is no off-road car parking provided at Bill Morrison to Looking Glass Bay Parks, there are car parking areas within walking distance to the proposed works. Although it is preferable that users be encouraged to utilise public transport options, there is the opportunity to provide some car parking at the entry to Bill Morrison Park. (Huntley's Ferry Wharf is only 1km to the beginning of the scope area in Looking Glass Bay Park). The Riverwalk parks serve numerous recreational needs. 3 parks supply sports fields, 5 parks provide playgrounds, 6 parks provide picnic facilities and toilets.

1.3 Evolution from the master plan

A master plan was produced in 2007 for an 8 km stretch of foreshore on the northern side of the Parramatta River.

The master plan forms the basis of the design., although there has been some development in the route since the master plan was produced.

1.4 Site area

The Site area includes 4 distinct areas;

Bill Mitchell Park

- Open parkland that fronts the Parramatta River on it's southern edge, characterised by flat open areas turf and stands of shade trees, that is a reclaimed gully (c 1940)
- Provides informal and sporting recreational use (cricket)

River Edge

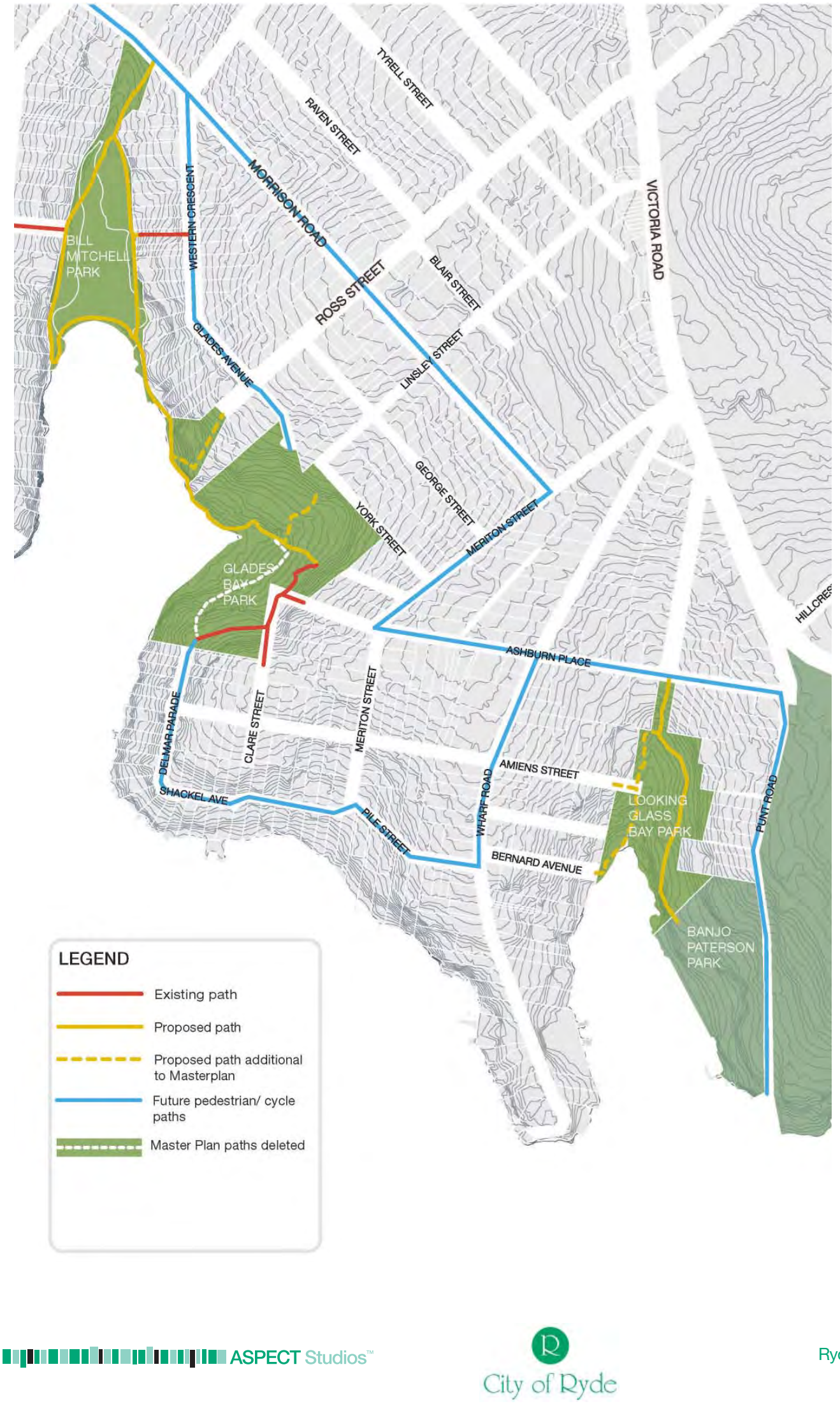
- Stretches from Bill Mitchell Park to the start of Glades Bay Park, through narrow areas of parkland mangrove and saltmarsh
- The area offers spectacular views, and access to the water's edge

Glades Bay Park

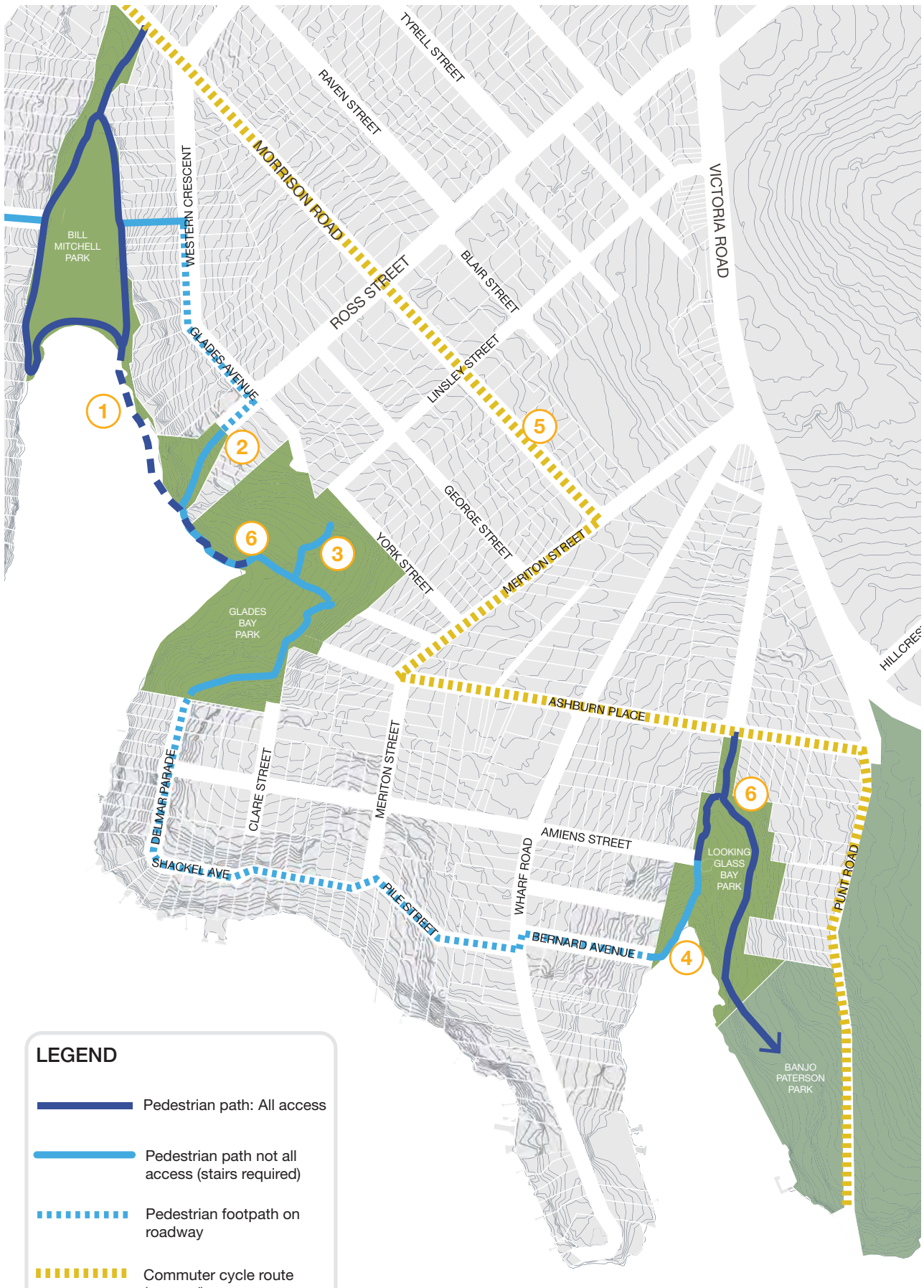
- An area of open parkland and Gully Forest on land that is undulating, and steep in some sections, with existing stairs and bridges traversing the landscape
- There are numerous aboriginal artefacts within thew area

Looking Glass Bay Park

- An area of forest along a creekline. The trail location is largely located on parkland adjacent to the forest and fronting residential properties. Access to the trail and it's connection points will be crucial considerations



1.5 Proposed main pedestrian / cycle connections



1. The connection from Bill Mitchell Park to Glades Bay Park will span over the water to respect privately owned property on the foreshore edge.
2. An additional connection from Ross Street to the walk will be formalised.
3. An additional bush track adjunct to the main trail will be formalised in Glades Bay Park
4. The trail in Looking Glass Bay Park will extend to the mud flats, and additional connections at Aimes Street and Bernard Street will be formalised.
5. Bicycle access will continue along adjacent roads separate from the pedestrian route (further to future design upgrades)
6. Extent of all access path.

2. Project appreciation

2.1 Landscape typology and features

ASPECT Studios has undertaken a site assessment of the River walk. What is clearly distinctive about the stretch of walk proposed between Bill Mitchell Park and Looking Glass Bay Park is it's bushland setting that is not experienced elsewhere on the Ryde River walk. The variety of landscape experiences along the route, and is rich cultural, ecological and archaeological heritage, give it great potential for a highly memorable walking track with opportunities for lookouts or rest spots at points of interest.

2.2 Experiential and interpretational Design opportunities

This section of the riverwalk has unique site conditions. It passes through remnant bushland, much of it significant vegetation communities; traverses over water and tidal flats, will likely be impacted on by potential sea level rise, and has good access to aboriginal artefacts and heritage remnants.

As such, the design and the materiality of the walk will be guided by the principles of **protection, conservation and interpretation.**

Sections of the walk already built

The existing river walk sections already built are largely located within parks and reserves. Given this, the path is usually a mixed use concrete path, ranging in width and colour.

Bennelong Park

Kissing Point Park

Anderson Park

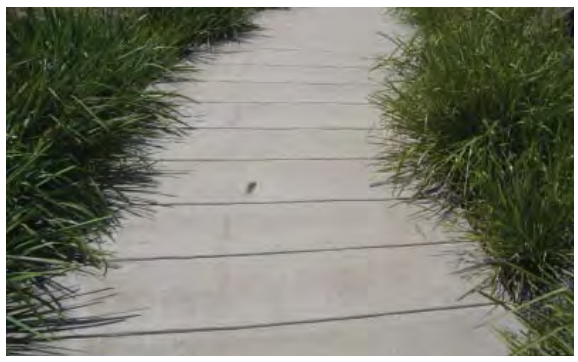
Morrisons Bay Park

Proposed materials:

Parkland Paths

- Continued use of concrete paths for shared cycle / pedestrian network and on-grade sections
- Planted edge to path in parks and reserves

Bennelong Park



Kissing Point Park

Boardwalk system

- To extend through mangroves and over water to protect vegetation, extend over water and traverse steep / undulating land
- Materials: fiberglass mesh/ timber boardwalk

Field of Mars

Narrabeen Lagoon

Rest stops

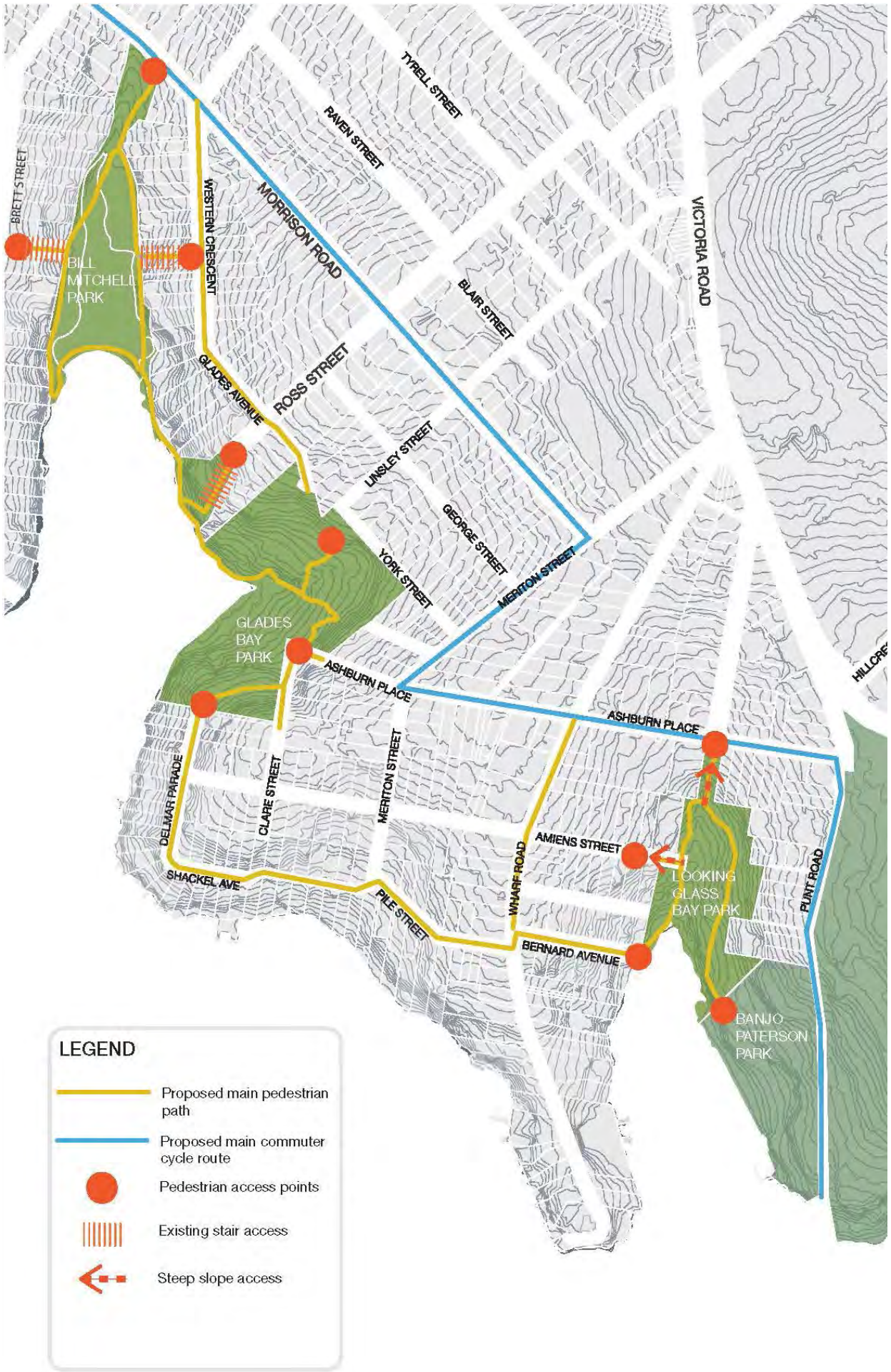
- Spaced regularly for respite and comfort
- Located to capitalise on views and access to historic remnants

Bennelong Park

Narrabeen Lagoon

2.3 Connections and access

There are several connection points from the surrounding streets down to this section of the river walk. All abilities access will be the aim, although there is a chance that complete access in this section of the walk will not be possible, and limitations will need to be explained in the signage strategy.



Bill Mitchell Park

- Morrison Street - Offers the best opportunity for an all access shared pedestrian/ cycle access to the river walk
- Brett Street - Is a particularly steep sandstone stair entryway. ASPECT will investigate if a series of ramps could be included to ease bicycle access
- Western Cres - Is an existing pathway with short stretches of sandstone stairs. Council to advise the heritage significance of the stairs if any. ASPECT will investigate the opportunity for short, steep sections of ramp adjacent the stairs to ease bicycle/ pram access

Ross St Entry

- This connection will be designed as a series of stairs and platforms down to the river's edge. It will also take into the consideration the presence of a midden, and the relocation of the dingy storage area and boat launch area

Glades Bay Park

- The proposed route will emerge at existing trail entry points within the grassed area of the park, and connect to existing concrete pathways. Key to these access points will be new interpretative signage highlighting the indigenous and ecological significant sites in this section of the walk. This section of the walk will have limited equal access due to the steep topography

Looking Glass Bay Park

- Banjo Patterson Park - the new pathway will follow an existing dirt trail, and connect onto existing paths in Banjo Patterson Park. This pathway network will be design for all access.
- Ashburn Place - Is a relatively steep access way from the road to the new path system. Aspect will investigate if an all access ramp is feasible.
- Aimes Street - Is an extremely steep entry point. ASPECT will develop 2 options for this entry; a raised ramp and platform option, and a cut and fill ramp option to achieve all access. Of key consideration will be the protection of the hydraulic infrastructure (pits and detention basis)
- Bernard Street - A connection from Bernard St to the trail will extend over the mud flats, protecting significant salt marsh vegetation, and respect the existing Sydney Water infrastructure present. Investigations will be made into connecting into existing stair and platforms of Sydney Water

2.4 Ecology and environmental protection

There are important ecotypes and vegetation communities along this section of the walk, particularly along the foreshore of Glades Bay Park.

The trail will be located to best avoid significant vegetation communities. For assurance, the 'tagged route' will be marked out on site, and the route walked by Council representatives and the Environmental consultants prior to sign off. Any necessary deviations in the route can then be addressed well before construction on site.

The construction zone corridor should be minimal (1 m either side) and tightly controlled to prevent any encroachment into the vegetation beyond.

2.5 Materials and durability

A 1.5 metres trail width is the best fit for the site, minimising site construction impacts, achieving appropriate access requirements, and creating a trail that is of an appropriate scale for the site.

Whilst Council has no specific design life requirements, a certain durability and longevity of materials is necessary. We believe the best decking material be fiberglass decking; an excellent material for its light and water permeability, construction ease, cost and durability.

We will be investigating a number of framing options for the boardwalk structure, in terms of cost, durability and design appropriateness. Materials will be chosen to respond to existing materials used on other sections of the river walk.

2.6 Stakeholder and community consultation

Community and stakeholder feedback is valued as a crucial part of the design process and we will be addressing a number of government stakeholders and approvals that need to be applied for as part of the consultation process. The stakeholders in the project have particular aims and concerns with the trail passing through or adjacent to their holdings or areas of concern, such as NSW Heritage, Fisheries (DPI) and NSW Maritime.

NSW Maritime has given preliminary approval for the trail to pass over the water or seawall where there is conflict with private property.

Two community consultations will be held 06.12.11 and 08.12.11. They will be held in the parks. These will be held prior to any development of the design, and be intended to gather information and feedback from community members.

A subsequent consultation will be held in approximately early February 2012 to provide community members to comment on the concept design for the trail.

2.7 Project Time frame and Cost management

The timing of the project is critical. We are aware that particular deadlines need to be met for construction of the project to ensure compliance with Councils time frame and often for Federal Grant conditions.

3. Analysis

3.1 Heritage and Cultural Significance

The site is rich with significant culturally historic elements including areas of indigenous significance.

Indigenous past:

Rock carvings and paintings are present in Glades Bay and a midden is located near the Ross Street entry that is currently impacted on by a boat storage area. Protection of the midden may be appropriate through preventing any excavation in the area. All artefacts require considered design development to interpret these sites appropriately, whilst ensuring their protection. A heritage report is being completed as part of the design process.

Cultural Significance:

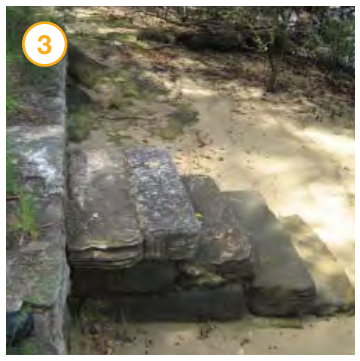
The Parramatta River is significant to the colonial development of Sydney. It was the major transport connection between Sydney and Parramatta, and as a result, was the site of shipyards, mills and heavy industry. As reclaimed bays, these sites have been forever changes by industrial occupation and use.

The river's edge was important as a gathering space for the thousands of spectators that would watch championship rowing from the late 1800's through to the 1930's.

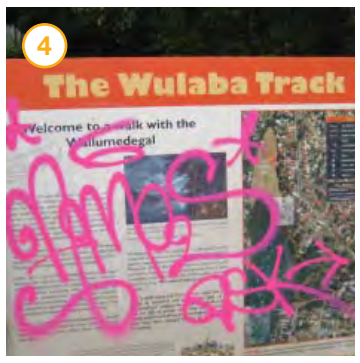
There is evidence of baths located in Glades Bay from the early 1900's, and the seawall at Bill Mitchell Reserve is c1940.

Water's edge: seawall c1940

Dingy storage area on midden



Bath remnant



Existing interpretation signage

Rock carvings

3.2 Landscape character

The site is comprised of a series of landscape spaces, with a remarkable difference in character. The remnants of Australian bush and parkland are significant as publicly accessible foreshore for residents to enjoy.

Bill Mitchell Park is a ‘sunken’ flat of turf surrounded by a dense tree skirt. It feels of an amphitheaters looked down upon by residents above.

The ‘promenade’ and ‘River Edge’ hug the foreshore and offer brilliant views across the Parramatta River.

Mangroves mark the entry to Glades Bay Park, and enclose the trail, turning views from the water internally to the forest. The environment is damp, cool and quiet.

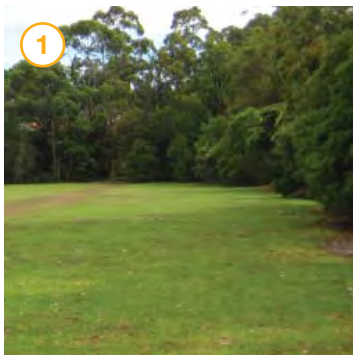
Parkland entries to the site offer glimpses into the residential world that seems so distant at times.

Glades Bay is a dense forest of ferns and sandstone outcrops. The path becomes narrower, and climbs over rocks, creek crossings and through dense foliage.

Glades Bay Park is a steeply sloping grasses area of open parkland. It signifies the return to civilisation.

Looking Glass Bay entered via the water’s edge, through reeds and grasses. This quickly changes to a clearing within dense forest that opens out into the parkland of majestic trees at Banjo Patterson Park.

The passing from one unique space to the next is part of the allure of this section of the River walk, and something that can be revealed through careful selection of material and considered location of the trail and rest stops.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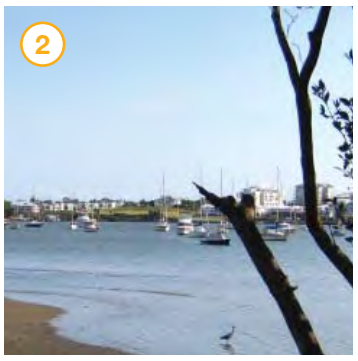
The ‘flat’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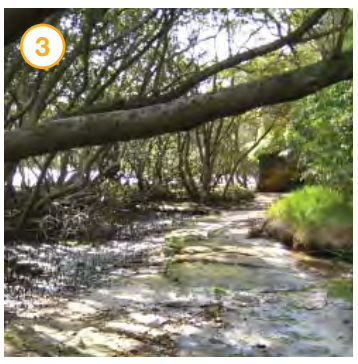
The ‘promenade’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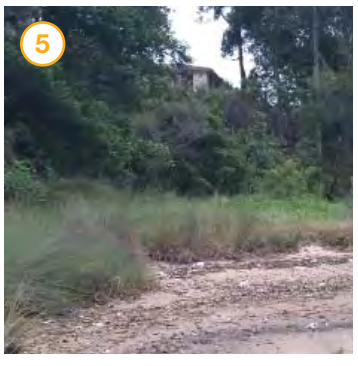
The mangroves


4

The forest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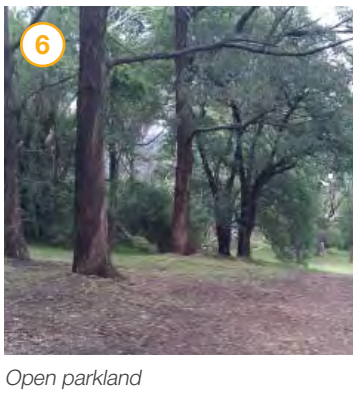
The mudflats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Open parkland

3.3 Environmental factors

The site is an important environmental resource for Sydney. Crucial to the design of the trail are:

Endangered Ecological Communities

Coastal Saltmarsh

- Located at Glades Bay Park and Looking Glass Bay
- Currently under threat by pedestrian traffic, litter, mangrove and weed incursion
- Potential impacts from climate change and sea level rises

Mangroves

- Located at Glades Bay Park and Looking Glass Bay
- Potential impacts from climate change and sea level rises

Other Endemic Vegetation Communities

Western Sydney Gully Forest

- Located at Glades Bay Park and Looking Glass Bay

The Mean High Water Mark + potential sea level rise

- Affecting the location and height of the trail

Acid Sulphate Soils

Are present in Bill Mitchell Park. All construction works should minimise exposure of soils to air.

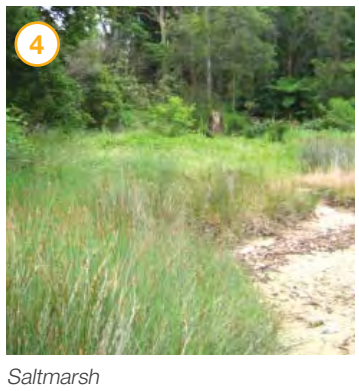
Potential contamination

As a site of industrial past and reclaimed land, these is potential contamination issues present that will impact on construction. These are to be addressed through the design process.

Sandstone outcrops

Mangroves

Western Sydney Gully Forest

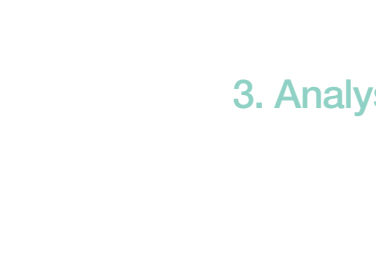


Saltmarsh

3.4 Recreational facilities / use

The site is an important recreation resource for Ryde and Sydney.

- The story of rowing and boating uses throughout the 20th century is strong, and continues today with Ross Street entry a site for recreational boat launching. The existing site for boat launch is impacting on an aboriginal midden, and the rock platform into the water. Opportunities for relocation are to be investigated
- Organised sports, cricket and soccer, are played at Bill Mitchell Park
- Is listed on the 'walking volunteers' maps for Sydney walking tracks
- Existing amenities at Bill Mitchell Park



Dingy storage + launch

Bushwalking

Cricket and soccer fields , and amenities at Bill Mitchell Park

3.5 Topography and drainage lines

The area of the parks is steep foreshore land on major drainage lines.

Bill Mitchell Park

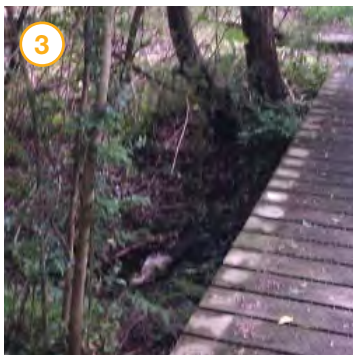
- Is a reclaimed Bay. It is flat, with steep landform surrounds
- Has an existing stormwater outlet to the western edge of the park
- Accessibility for bicycles, prams and wheelchairs from adjoining roads to the park is to be considered

Glades Bay Park

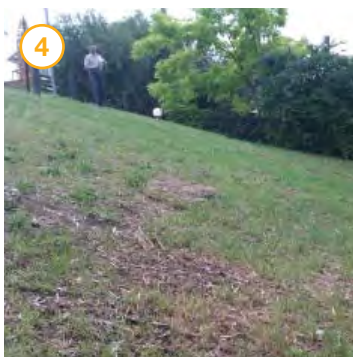
- Is a steep area of forest around a creekline

Existing stormwater outlet

Steep edges to Bill Mitchell Park



Creekline in Glades Bay



Steep slopes of Aimes St entry

Aimes St Detention Basin

4. Design principles

4.1 Safe and equitable access

- Maximise extent of accessible pathway
- Connect to existing public transport connections
- Design for safety (kick-rails/ handrails etc)
- Provide regular rest stops for respite and comfort

4.2 Experiential and Interpretation Design

- Provide a range of materials that highlight the different landscape typologies
- Explore the opportunities for lookouts/ rest stops to capitalise on views and vistas, site landscape features
- Make reference to the aboriginal artefacts and historic remnants on site through the location of rest stops and interpretative signage / elements
- Allow user interaction with the water

4.3 Sustainability and Durability

- Materials and fixtures to be highly durable for longevity
- Materials to be selected appropriate for the tidal and salt conditions on site

4.4 Environmental protection

- Provide a raised boardwalk for sections of the walk to protect significant ecological communities
- Provide a new dingy launch area to protect existing sandstone outcrops
- Provide raised boardwalk trails through Glades Bay Park and sections of Looking Glass Bay Park to formalise a trail location and reduce the likelihood of trampling via alternate bush tracks

5. Design components

5.1 Parkland Paths

Existing condition

Located within the flat open turf areas at Bill Mitchell Park and the western edge of Glades Bay Park

Design objective

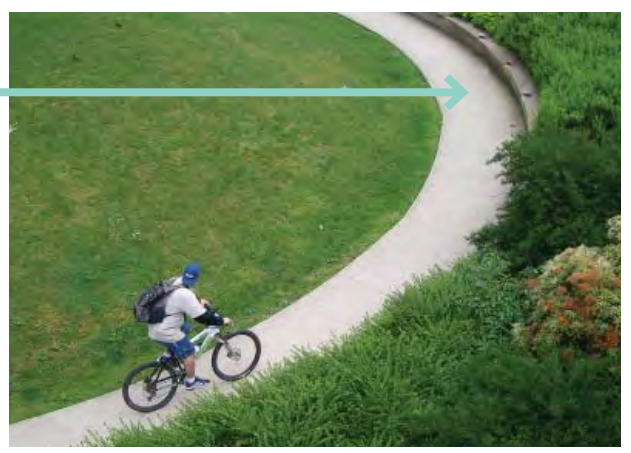
- **Paths materials are to be low maintenance and sustainable**
- **Paths are to be on-grade, accessible to all, and designed for mixed-use (recreational pedestrian and cycle use)**
- **Parkland paths should form the defined edge between mass planting and turf at Bill Mitchell Park**

Opportunities/ considerations

Consider the use of crushed stabilised gravels and sandstone as opposed to concrete as a more sustainable option (where grades permit)

Consider use for recreational cycling: linemarking, material etc

Consider the edge to the path as a raised edge?



5.2 Water's Edge

Existing condition

Located along the southern edge of Bill Mitchell Park

Design objective

- **The design will provide a barrier between the path and the sporting field**
- **Design of the water's edge will marry the parkland paths with the river edge boardwalk**
- **The water's edge should be designed as the 'face' of the park**
- **The design will improve access to the waters edge from the park**

Opportunities/ considerations

Consider level change to protect path from sporting field (doubles as seating edge)

Consistent material type/ edge treatment carried through both paths

Use high quality materials

Integrate interpretation at water's edge

Encourage people to inhabit the edge through seating opportunities

5.3 River Edge Boardwalk

Existing condition


Stretches from Bill Mitchell Park to the start of Glades Bay Park, through areas of open parkland, mangrove and saltmarsh

Design objective

- **The design and location of the boardwalk will protect significant ecological communities, and aboriginal artefacts on site**
- **Paths are to be raised boardwalk above the mean high tide level**
- **Boardwalk to be designed to be accessible to all**
- **Boardwalk and rest stops located to maximise views and experiential qualities, and allow some opportunities for public access to the water's edge**

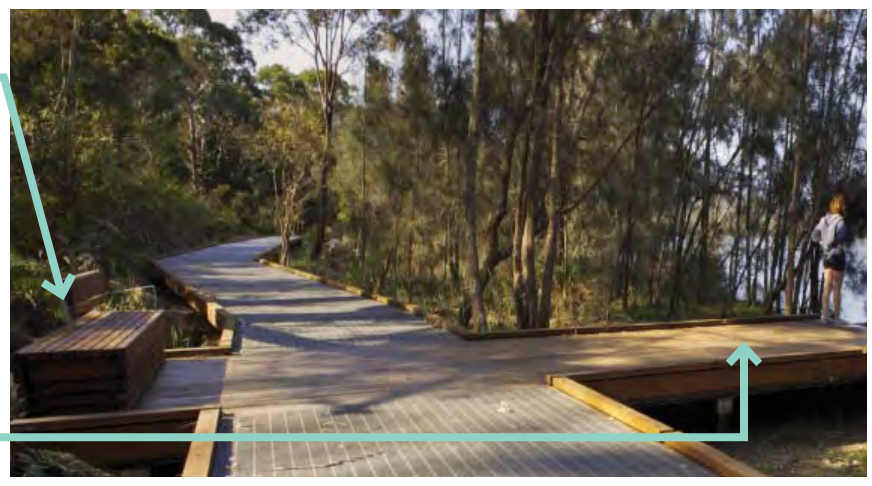
Opportunities/ considerations

Consider traversing the water, rather than the land edge to avoid significant vegetation and historic artefacts

Provide kick edge and balustrades where fall heights require


Consider distance between seating, backrests and handrails on seats, ramp grades, handrails, tactile indicators + stair nosings

Consider change of material at rests stops to highlight them as 'something special'



5.4 Forest boardwalk

Existing condition

Located within the Sandstone Gully forest and Parkland areas of Glades Bay Park

- **Design principles**

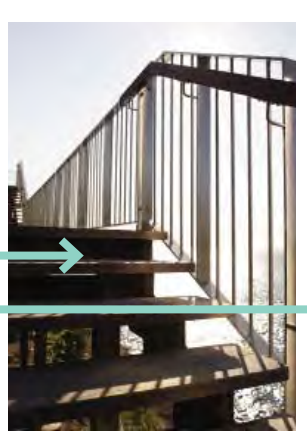
- **Boardwalks through the forest are to be narrower and will traverse the route via platforms and stairs as a pedestrian only walk**

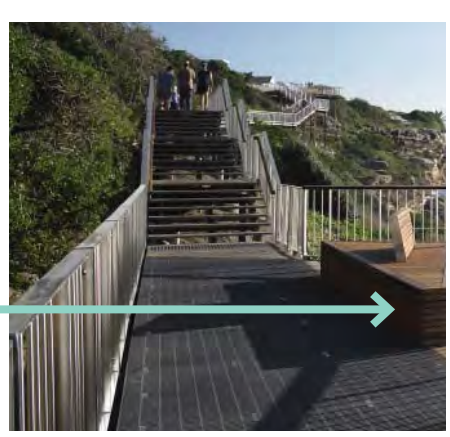
- **The design of the boardwalk and rest stops will protect significant trees, vegetation and indigenous artefacts**

- **The boardwalk should be designed as an upgrade of the existing trail, and be of appropriate scale and material for a 'bush walk'**

Opportunities/ considerations

Consider the design of stairs, ramps, seating and rest stops to maximise comfort and enjoyment





Consider avoiding significant stretches of vegetation, and incorporating mature trees into the design where the path must pass by closely

The boardwalk should hug the ground where possible

5.5 Access points + connections

•

Existing condition

There are a number of existing pedestrian access points to the trail that will be upgraded

- **Design principles**

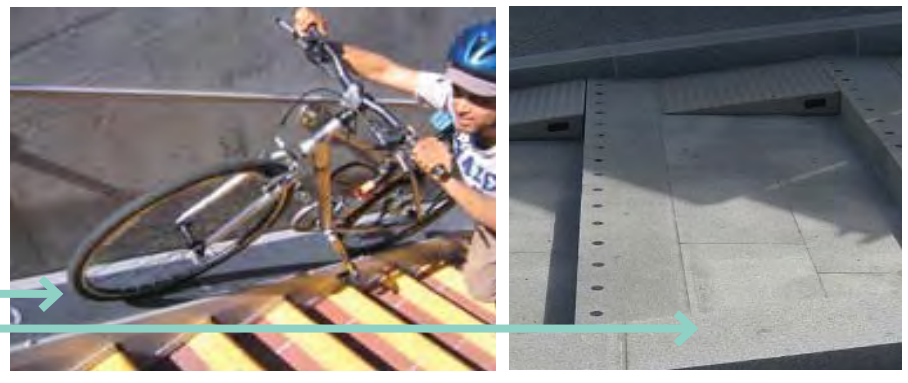
Opportunities/ considerations

- **Access points should be accessible to all where possible**

The design of access ways should resolve level changes through a series of ramps and platforms, with rest stops provided for comfort

- **Provision for bicycles should be considered in the upgrade of existing access ways**

Consider use of 'step ramps' over existing stairs to allow riders to push their bikes down otherwise inaccessible accessways



- **On-road connections to be highlighted**

Consider use of colour that could be a consistent theme throughout the walk as well as on-road connections

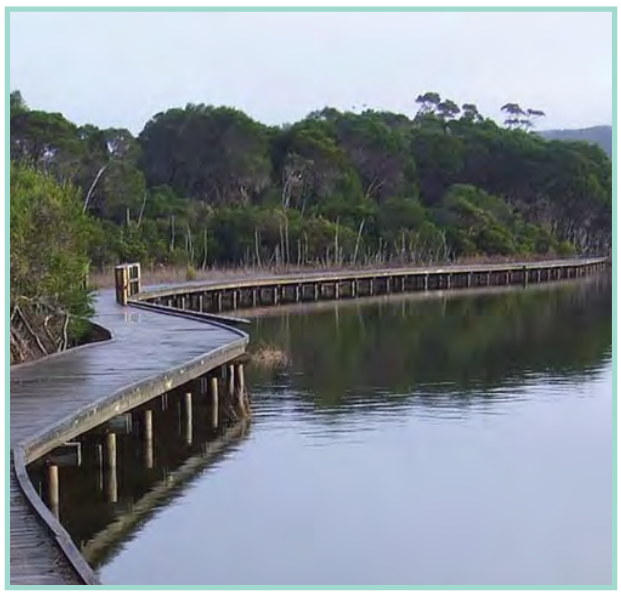
Consider use of in-ground marker to highlight connection

6. Precedents

6.1 Boardwalks over water + through mangroves

CURALO LAKE_NSW SOUTH COAST

- Intimate scale 1.2-1.5m wide (not cycle accessible). 5. Design Components 17
- Low impact
- Handrails + kick rails for safety where required



METUNG_VIC

- Handrails to prevent falls and restrict access
- Kick rail for safety
- Intimate scale: 1.2-1.5m wide (not cycle accessible)

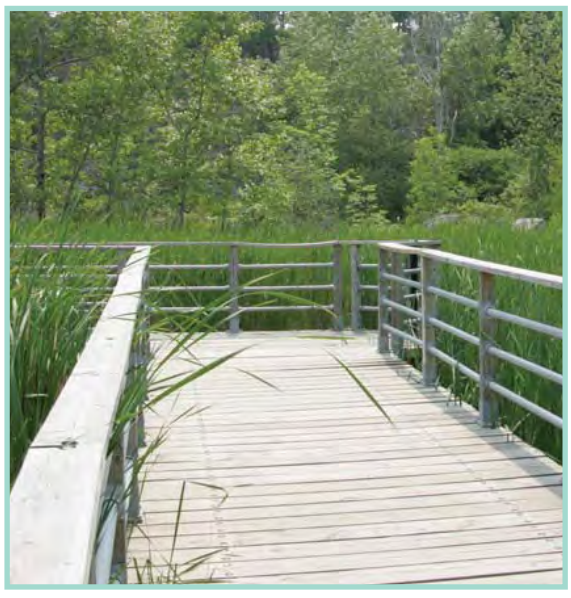
MERIMBULA_NSW SOUTH COAST

- Intimate scale
- Low impact
- Minimise handrails where not required
- Intimate scale: 1.2-1.5m wide (not cycle accessible)

6.2 Raised boardwalks and stairs over ground

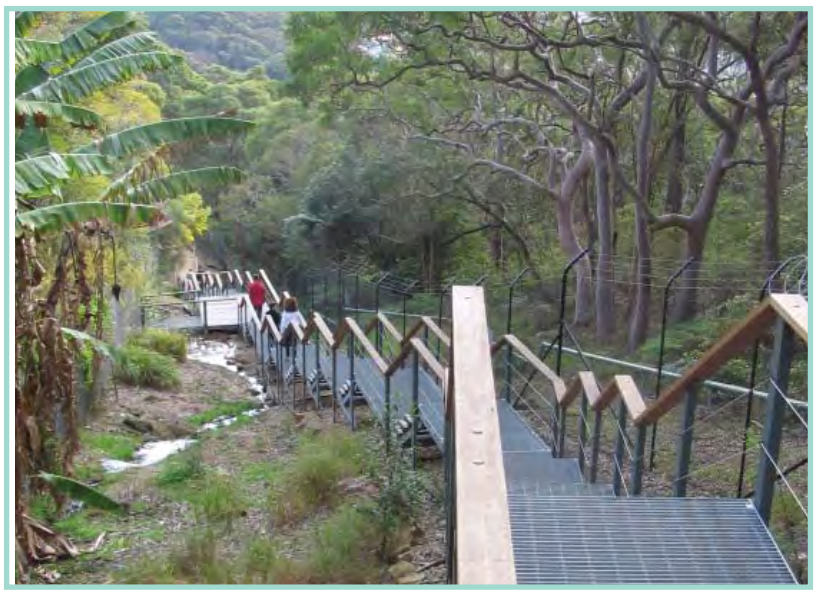
NARRABEEN LAGOON_NSW

- Fibreglass mesh + timber
- Change to on-grade path where possible
- Elevated to protect wetlands, mangroves + saltmarsh
- Appropriate for tidal conditions or low lying marshy ground.



JEFFS HOME, HALTON, CALIFORNIA

- Timber boardwalk with lightweight handrails
- Change to on-grade path where possible
- Elevated to protect significant vegetation
- Blends in with the surrounding landscape



CHOWDER BAY/ NORTH HEAD SYDNEY HARBOUR FEDERATION TRUST

- Grating boardwalk
- Low profile/ low key
- Balustrades only at stairs
- Durable

6.3 Pathways on ground

NARRABEEN LAGOON_MT PENANG FESTIVAL GARDENS NSW

- Decomposed sandstone
- Retained edge for maintenance
- For flatter areas with no run off.

COAL LOADER NORTH SYDNEY_BLUE MOUNTAINS NATIONAL PARK NSW

- Cut sandstone stairs and ‘catwalks’.
- Integrates with surrounding landscape.
- Creek crossings

SANDSTONE STEPPERS_BLUE MOUNTAINS NATIONAL PARK NSW

- Cut sandstone stairs and ‘catwalks’.
- Integrates with surrounding landscape.

CONCRETE FOOTPATH

- On grade areas
- Can be used on steeper slopes than crushed sandstone.
- Is equal access and usable in all weather.

SANDSTONE CUT STEPS AND FOOTPATHS_WAVERLEY COAST WALK- DOVER HEIGHTS

- Integrates with surroundings.
- No maintenance
- May not comply with all access codes- informal access.

7. Design Options

Option 1| Over water/ on-grade boardwalk mix

OPTION CHARACTERISTICS

- On grade path from Bill Mitchell Reserve
- Elevated boardwalk In the intertidal zone between high and low tide between Bill Mitchell Reserve and Ross Street only.
- Avoids the seawall.
- Pedestrian access.
- Possibility of a small jetty structure to connect with Ross Street.
- Avoids the mangrove stands.
- Connects back to existing desire line through Glades Bay Park.

Option 2| Boardwalk over water

OPTION CHARACTERISTICS

- On grade path from Bill Mitchell Reserve
- Elevated boardwalk extension In the intertidal zone between high and low tide between Bill Mitchell Reserve and Glades Bay Park.
- Avoids the seawall.
- Pedestrian access.
- Possibility of a small jetty structure to connect with Ross Street.
- Avoids the mangrove stands.
- Connects back to existing desire line through Glades Bay Park.

Option 3| On-grade path

OPTION CHARACTERISTICS

- On grade path from Bill Mitchell Reserve, up to Western Crescent.
- No elevated marine zone boardwalk.
- ‘No access’ signage for Council liability requirements.
- No equitable access to foreshore (except from Bill Mitchell reserve.
- Possibility of a small jetty structure to connect with Ross Street.
- Avoids the mangrove stands.
- Connects back to existing desire line from Ross Street through Glades Bay Park.

Option 4 | As presented by residents at Workshop 2 - 30 May 2012

OPTION CHARACTERISTICS

- On grade path from Bill Mitchell Reserve, up to Western Crescent.
- Elevated boardwalk extension in the intertidal zone between high and low tide between Ross Street and Glades Bay Park.
- 'No access' signage for Council liability requirements.
- No equitable access to foreshore (except from Bill Mitchell reserve.
- Possibility of a small jetty structure to connect with Ross Street.
- Avoids the mangrove stands.
- Connects back to existing desire line from Ross Street through Glades Bay Park.

8. Landscape Design

6.1 Landscape Statement

Refer Drawings:
Ryde Riverwalk (Bill Mitchell Park, Glades Bay and Looking Glass Bay): Landscape Master Plan: Development Application: 11050-L001- L008, Rev C, November 2012

Landscape Overview

ASPECT Studios was commissioned by the City of Ryde Council to produce a Landscape DA Plan for a new section of foreshore walk between Bill Mitchell Park and Glades Bay Park, and through Looking Glass Bay Park.

This 2km (approx.) trail, located alongside the northern edge of the Parramatta River in Gladesville, formalises existing bush tracks. It forms part of an overall 8km regional riverfront walk that follows roads and interconnected parks and reserves in Ryde from Wharf Rd in the east to Punt Rd in the west.

The site area encompasses 3 of the 4 remaining park upgrades to complete the entire 8km Ryde Riverwalk Master Plan stretch, with only Banjo Patterson Park (west of the site area) yet to be developed.

The existing route is well known to local bush walkers, and is listed on the walking Coastal Sydney website for thew Walking Volunteers. Importantly, it forms park of the waterfront walk that stretches from Woolwich to Parramatta.

There are a number of significant Aboriginal and cultural historic sites that are within the area. Remnants of Aboriginal occupation, including rock carvings, middens and shelters are present on site. Some items have been interpreted in the past, and these are fairly apparent on site, although many remnants remain obscured by vegetation.

There is also evidence of early European occupation, with remnants of sandstone baths present near Glades Bay Park.

There are a number of significant vegetation groups adjacent both Glades Bay and Looking Glass Bay. Mangroves stretch from Ross Street reserve to Glades Bay, and also a large stand at Looking Glass Bay. Small area of saltmarsh are located near the narrow 'beach' between Ross Street Reserves and Glades Bay, as well as a larger stand at Looking Glass Bay. There is also a wide area of seagrass at Looking Glass Bay near the Bernard Ave entry.

Design Process

The process of design for the new section of the Ryde Riverwalk is informed by a rigorous design process including:

- The assembling of a design team. ASPECT Studios worked alongside Ducros Design (Civil and structural engineering) in developing a design that is appropriate to the site conditions and feasible in terms of engineering. The designs have been costed by Altus Group (Quantity Surveyor)

- A comprehensive community and stakeholder consultation process. This included 3 rounds of consultation at various stages of the development of the concept plans. Options were presented, feedback received and collated and the landscape design updated in response.

- Undertaking archaeological investigations. Council commissioned an archaeological investigation and management plan to be undertaken concurrently with the production of design for this scope of works. The design is informed by the findings and feedback from the archaeologist to avoid impacting on significant sites through a through review process. Refer Archaeological Management Plan, Ryde Riverwalk, Gladesville, Sydney, NSW: Bill Mitchell Park, Glades Bay Park & Looking Glass Bay Park, Dominic Steele Consulting, Jan 2012

- Reviewing the site environmental conditions. Council commissioned a environmental investigation, vegetation mapping and Statement of Environmental Effects be produced concurrently with the production of a design for the area. The resulting design responds to feedback and recommendations made by the environmental consultants to minimise impacts on significant vegetation communities. Refer SEE, NGH Environmental.

- Review of the site's geotechnical and soil contaminants. In order to finalise the trail design, a geotechnical and soil contaminants investigation was undertaken. This informed both the landscape design and the structural design for the boardwalk at concept design stage. These reports will also form the base for construction methodology in future stages. Key findings are that generally the water's edge consists of shallow alluvial material over sandstone bedrock, and that low levels of contaminants are present through the introduction of fill material in the past. Construction of the trail will also have to respond to the presence of acid sulfate soils, an acid sulphate management plan will be required, and an appropriate construction methodology to minimise impacts will have to be adopted.

Refer; *Report to ASPECT Studios on Geotechnical investigation for proposed upgrade of the Ryde Riverwalk at Bill Mitchell, Glades Bay and Looking Glass Bay Park, Gladesville, NSW, 20 November, 2012, JK Geotechnics + Report to ASPECT Studios on Preliminary Contamination and Acid Sulfate Soil Screening for proposed upgrade of the Ryde Riverwalk at Bill Mitchell, Glades Bay and Looking Glass Bay Park, Gladesville, NSW, November, 2012, EIS (Environmental Investigation S*ervices)

Landscape Strategy: Principles and key considerations

Resulting from the community consultation process, background research, workshops with Council and feedback from the consultant team, a strategy for the design was developed. The aims of the Landscape design for the new section of Ryde Riverwalk are thus:

- Providing an intimate scaled pathway that formalises an existing trail;
- Maximising the extent of accessible pathway where grades permit;
- Respecting the neighboring property interface through careful siting of the pathway and boardwalk;
- Ensuring that the pathway is located to prevent impact on historical (both Aboriginal and Colonial) artifacts;
- Locating and designing the pathway to minimise impact on vegetation. Locating the pathway away from the most significant vegetation communities (Saltmarsh);
- Providing a variety of experiences along the pathway, with opportunities to rest, read about the local history and absorb the views;
- Providing carparking to prevent impacts on local roads for users of the path;
- Providing a design that is unique to Ryde, and unified in its character;
- Providing a scheme that is sustainable; is robust and achieves a 50yr lifespan;
- Enhancing the natural environment through provision of additional tree and understory planting.

Landscape Areas
The scope of works can be broken into 4 separate areas;

Bill Mitchell Park.
Including a perimeter path around the park, a new carpark at Morrison Rd entry, upgrades to pedestrian entries from Western Crescent and Brett St/ Champion St, and new public interface at the seawall edge.

Ross St Reserve.
Including an elevated boardwalk from Bill Mitchell, a new ramp for dinghy access to the water, retention of existing dinghy storage area, new stair access from Ross St, and a new elevated boardwalk through the mangroves toward Glades Bay.

Glades Bay.
Including new elevated boardwalk and rest stops through the mangroves, a new on grade path through bushland, new bridge crossings, and new entry statements in Glades Bay Park.

Looking Glass Bay.
Including an elevated boardwalk over the water's edge from Bernard Ave, new elevated boardwalk through the bushland, upgraded entries from Amiens St and Ashburn Place, and new on grade path connection to Banjo Patterson Park.

A detailed description of these areas follows.

Bill Mitchell Park

The proposed works for Bill Mitchell Park include a new concrete recreational pedestrian/ cycle path around the perimeter of the existing field. New signage and seating is proposed at key entry points/ rest areas. Additional low mass planting is located between the path and the boundary, enhancing the existing planter border to the park. These works will also amend drainage issues to the western edge of the path through minor regrading and civil works.

Pedestrian entries from Western Crescent and Brett St/ Champion St are to be upgraded with additional stairs to improve access, and new sandstone flag entry platforms with seating and signage. New feature tree planting (Angophora costata and Glochidion ferdinandii) mark each entry.

Equal access was deemed unfeasible for these entries, where existing grades are steep. A new entry from Morrison Rd, though, provides accessible entry, as well as a new vehicular parking area. This parking area, providing 13 new car spaces, formalises it's existing use, whilst protecting existing trees. It's inclusion also responds to resident concerns for increased demand on local street parking associated with the implementation of the new trail. Additional tree planting (Angophora costata) mark the entry as a formal grove.

The southern seawall edge of the park is formalised through a crushed stabilised sandstone path and seating area. Low brick walls, with integrated seating, provide an area of respite and enjoyment of the water's edge. A new sport fence is provided as protection from balls. New planting of low native species is proposed as a 3m buffer to the seawall, as a protection barrier to construction impacts on the existing seawall, as well as behind the seating area as a buffer to the play fields. New grove planting of native trees at either end of the seating area provides much needed shade, whilst maintaining views to the water.

The existing field is to be re-linemarked and goal posts relocated to a new rotated position. This is to remove the goal posts outside of the primary axial view from Morrison Rd entry down toward the water.

Ross St Reserve

From the south- eastern corner Bill Mitchell Reserve, the path spans out over the water and continues as a suspended boardwalk toward Ross St Reserve. The path is a 1.8m wide fibreglass mesh boardwalk with stainless steel balustrades. It is located 3m away from the edge of property boundaries to enable access to the water from individual properties under the boardwalk, as well as enabling a separation of public use from private properties. No lighting is proposed for the boardwalk to discourage night time use of the area. The level of the boardwalk is set at a minimum level of 1.3 AHD to accommodate potential future sea level rise.

The boardwalk joins land at Ross St Reserve adjacent to the existing dinghy storage rack. Whilst no increase/ change on the dinghy storage area is proposed, the new boardwalk will improve access to the water from the racks via the construction of a new slip-way. The existing pedestrian access to Ross St is provided through new stair and surface works. A new entry area with seating at the top of Ross St takes in the exceptional view across Parramatta River.

The walk proceeds south through mangrove area as a low elevated 1.5m wide fibreglass boardwalk along the river edge. The location of the trail has been carefully sited to ensure minimal impacts on significant vegetation.

Glades Bay

Glades Bay marks the end of the accessible part of the riverwalk coming from Bill Mitchell Park. A lookout at the edge of the mangrove zone allows for wheelchair turnaround, and capitalises on the view toward the south.

From this point onward, the riverwalk moves inland through bushland and forest. Where grades permit, the walk is 1.5m wide crushed stabilised sandstone 'bush trail' with sandstone block stairs. Over creeklines, new bridges are to be constructed in fibreglass mesh boardwalk material.

The siting of the trail picks up on existing bush tracks, formalising it to a single path to reduce the impact of multiple path network on the local vegetation are archaeological artefacts present in the area. Interpretation of existing exposed aboriginal carvings is proposed, but the large number of artefacts present in the area are to remain untouched and left obscured by vegetation.

Looking Glass Bay

The proposed landscape works at Looking Glass Bay include a new boardwalk entry joining Bernard St, spanning the water's edge in front of the Sydney Water pump station. The boardwalk has been carefully sited to ensure minimal impact on the seagrass and saltmarsh vegetation communities on the water's edge. The fibreglass mesh path travels to the north traversing the steep grades through a series of flights of steps. Balustrades are installed where dangerous fall heights require, but otherwise, the path is installed with a low kick edge where it hugs close to the existing ground surface.

Access is provided from Amiens St via a new stone staircase. Investigations were made into the feasibility of installing an all access ramp at this location, but the visual and physical impact on the environment was undesirable. A ramp is installed at Ashburn place, with minor soft landscape upgrades to the reserve adjacent the road. The ramps at this entry are greater than Australian Standards for disabled access, but do provide acceptable entry for bikes and prams. Again, the design for all access in this area was too great a visual and environmental impact to be acceptable.

The path system toward Banjo Patterson Reserve alternates between an insitu concrete (where grades are steeper than 1:20) and crushed stabilised sandstone (on flatter areas). These flatter areas also provide the opportunity to rest, with widened path areas and seating. All entries are marked with a sandstone platform, seating and signage.

Materials Strategy

The materials selected respond to a number of criteria;

1. Responding to the local sandstone geology.
The use of crushed stabilised sandstone paths (where grades permit) and sandstone flagging at entries recalls the geology and character of the area.

2. Providing longevity, sustainability, low maintenance and a 50yr life.
All materials are selected to achieve a 50yr minimum life span. Surface materials include fibreglass mesh boardwalk, insitu concrete, crushed stabilised sandstone and sandstone flagging. New stairs are selected in sandstone to match existing. Walls at Bill Mitchell Park and some entries are proposed as brick. Steel seating and edges are to be a painted MIO finish.

3. Providing safety.
All ground surfaces are non-slip in all weather. A low kick rail on all edge of the path provided an added protection. Balustrades are provided on elevated boardwalks, lookouts and stairs in accordance with Australian Standards.

4. Providing amenity.
New rest areas are provided at regular areas as a small widening. These have been carefully located to capitalise on views, and provide for comfort. Interpretation of the local environmental and archaeological history should be incorporated into rest areas and at regular intervals along the riverwalk.

5. Providing a consistent and unique response.
The material selection is a limited palette so that the riverwalk reads as one and relates to the existing sections of the walk already constructed. As this is a uniquely 'bushland' section of the riverwalk though, the material selection does include 'softer' and more natural materials. It is tied together through a consistent edge detail of folder painted steel as a kick, rail, interpretative plinth, sigh, balustrade, seat. This edge forms a 'painted ribbon' along the edge of the riverwalk when viewed from afar, and identifiable unique to this riverfront walk.

Planting Strategy

The planting strategy for the new riverwalk is primarily to 'protect' and 'enhance'. The location of the trail has been carefully sited, and the design of the structure carefully considered, to ensure the most significant areas of vegetation are protected. Any impacts on vegetation along the corridor during construction should be offset with a program for bush regeneration along the trail. Additional proposed planting at parks and within the bushland areas included new low mass planting of native grasses and shrubs including Lomandra longifolia, Dianella caerulea, Isolepsis nodosa, Banksia serrata and Hakea sp. These are species local to the area, and intended to build on the existing character of the bush and provide habitat for fauna. New trees are provided to mark the entries into the Riverwalk. Species include Angophora costata and Glochidion ferdinandii, both indigenous to the area. Eucalyptus spp. are proposed as shade trees on the water's edge at Bill Mitchell Park.

Pedestrian Accessibility

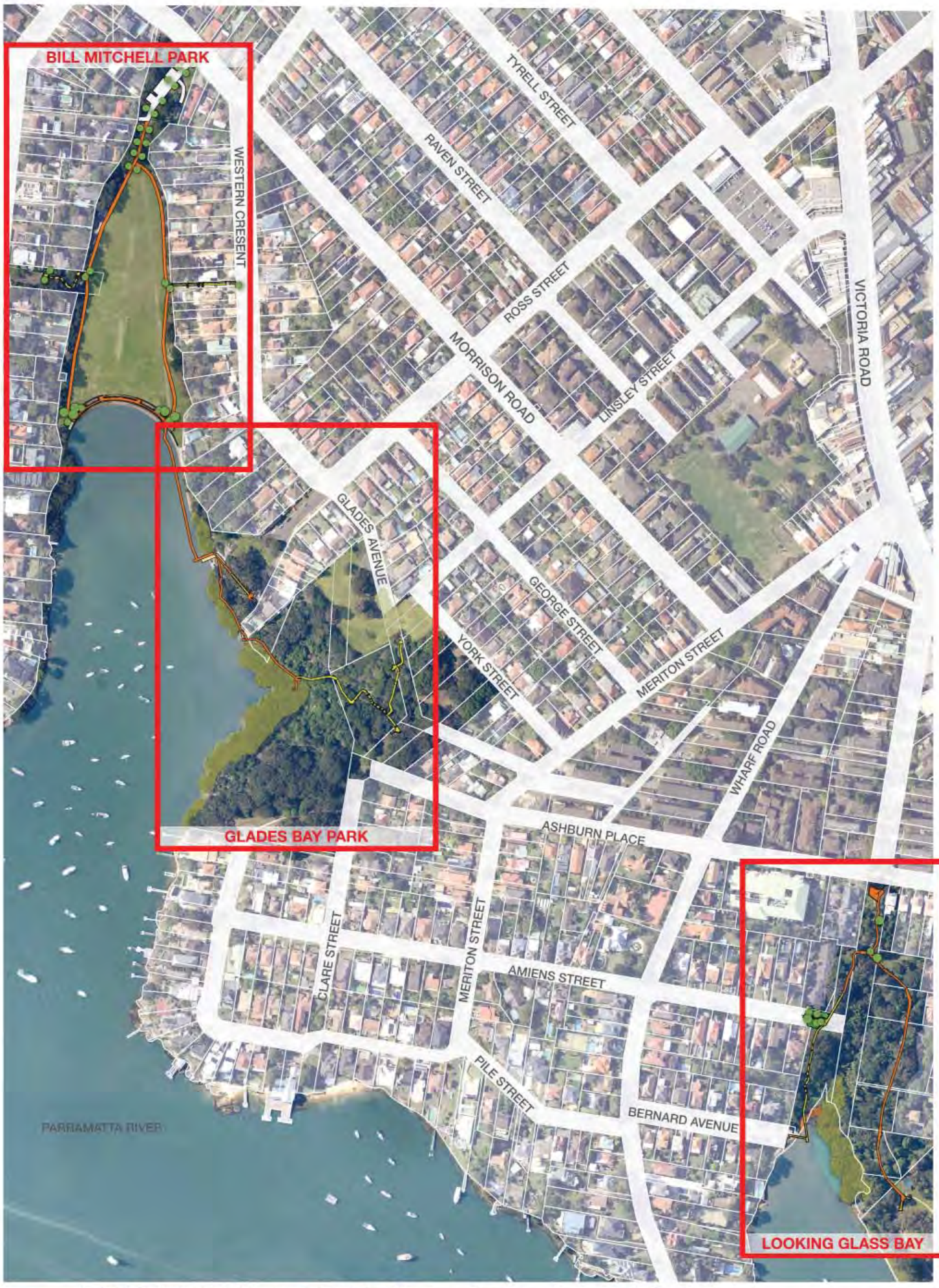
Whilst the overall Ryde Riverwalk is intended as a shared pedestrian/ cycle path, this section of the walk becomes a split system whereby pedestrian access to permitted along-side the river edge and through the bushland areas, whilst cycle route will be directed along adjacent roads.

Through the design process, cycle access on the riverfront edge was deemed unachievable due to steep grades which necessitates stairs in many areas, as well as the desire to keep this section of the riverwalk a low impact and intimate 'bush walk'. This is a direct response to resident feedback. A shared path would also need to be at least 2.5m wide to Australian standards, and have adverse impacts on the significant vegetation communities in the area. Where possible, equal access has been provided. All access is achieved from Morrison Rd at Bill Mitchell Park, around the perimeter of Bill Mitchell Park, and south along the boardwalk until the entry into Glades Bay bushland area. A lookout has been provided at this end to allow wheelchairs to turn around.

Likewise at Looking Glass Bay, equal access grades are achieved from Banjo Patterson Park through to the path at the bottom of the hill at Amiens St. A ramped entry from Ashburn Place, whilst not appropriate for wheelchair grade access, does permit both bicycle and pram access. The lookout at Bernard Ave entry is also accessible from the street. The feasibility of achieving equal access ramps at all entries was explored, but weighed up with the visual and environmental impacts, these were limited to key entries only. Accessible routes will be noted through clear and legible wayfinding signage, and seating and rest stops provided adjacent to the path in all areas.

Informal cycle access is also provided as a recreation path around Bill Mitchell Park and from Ashburn Pl to Banjo Patterson Park at Looking Glass Bay. Elsewhere, cycle access will be discouraged to limit impacts on vegetation and the natural environment.

Landscape Plan | **Context**



Landscape Master Plan | **Background**

The Ryde Riverwalk is an 8km trail located alongside the northern edge of the Parramatta River in Gladesville.

The site scope formalises a 2km (approx.) of existing informal trail along the coastal edge of Bill Mitchell Park, Glades Bay Park, and Looking Glass Bay Park.

It forms part of a regional river walk that follows existing trails and roads in Ryde from Wharf Road in the east to Punt Road in the west via a series of interconnected parks and reserves (see Ryde River Walk Master Plan, 2007).

The site area encompasses 3 of the 4 remaining park upgrades to complete the entire River walk Master plan (only Banjo Patterson Park on the western end remains)

The existing route is also well known to local bush walkers, and is listed on the 'Walking Coastal Sydney' website for the Walking Volunteers. Importantly, it forms part of a coastal walk that stretches from Woolwich to Parramatta, and traverses sites of Aboriginal and cultural history, ecological importance, and spectacular scenery.

Landscape Plan | **Key**

- Accessible Path Network (no stairs)
- Path Network with stairs

Strategy | **Principles and key considerations**

The landscape concept is a response to;

- Providing an imtimate scaled pathway that formalises an existing trail.
- Maximising the extent of accessible pathway where grades permit
- Respecting the neighboring property interface through careful siting of the pathway and boardwalk
- Ensuring that the pathway is located to prevent impact on historical (both Aboriginal and Colonial) artefacts
- Locating and designing the pathway to minimise impact on vegetation. Locating the pathway away from the most significant vegetation communities (Saltmarsh)
- Providing a variety of experiences along the pathway, with opportunities to rest, read about the local history and absorb the views.
- Providing carparking to prevent impacts on local roads for users of the path.
- Providing a design that is unique to Ryde, and unified in its character.
- Providing a scheme that is sustainable; is robust and achieves a 50yr lifespan.
- Enhacing the natural environemt through provision of additional tree and understory planting.

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: 1:2000 @ A1 (0, 40, 80, 120, 160m)

Landscape Master Plan | Development Application

Dwg no.: **11050-L001**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Bill Mitchell Park**

Landscape Plan | **Context**

Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. 2.5m Concrete path, appropriate for vehicular loads (bin collection/ maintenance vehicle)
2. New carpark. Asphalt surface with new avenue planting of Angophora costata
3. Existing soccer field rotated to remove goal posts from main line of sight
4. Existing seawall to be retained.
   New gathering space; low brick walls with integrated seating, crushed stabilised sandstone surface and new sporting fence within mass planting
5. Grove native trees including Eucalyptus botrioydes and Glochidion ferdinandi. Mass understory of native grasses and groundcovers
6. New bech seats; steel with timber slats

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

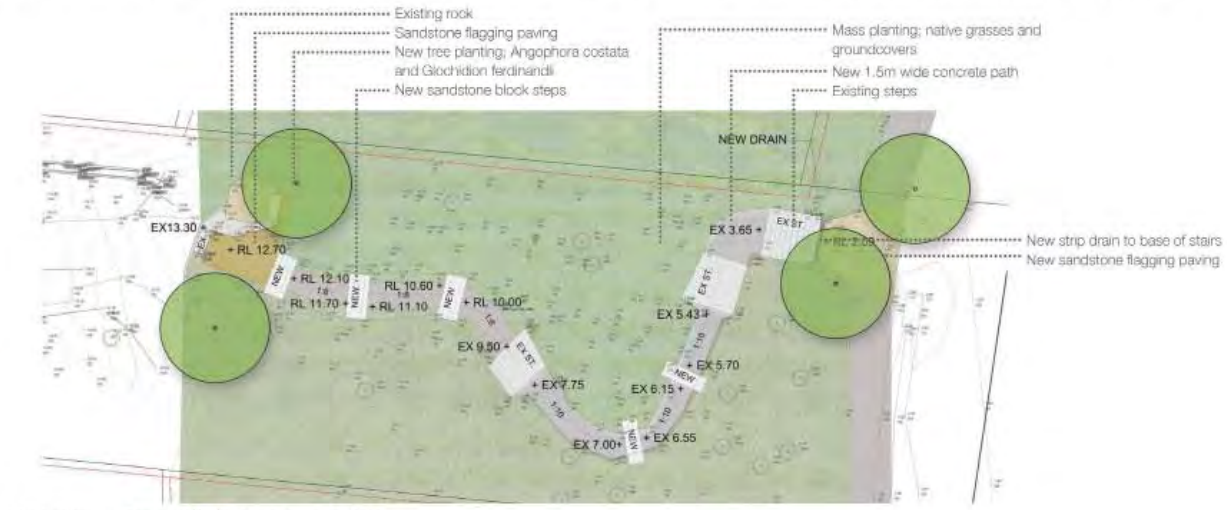
Scale: 1:500 @ A1

0 10 20 30 40m

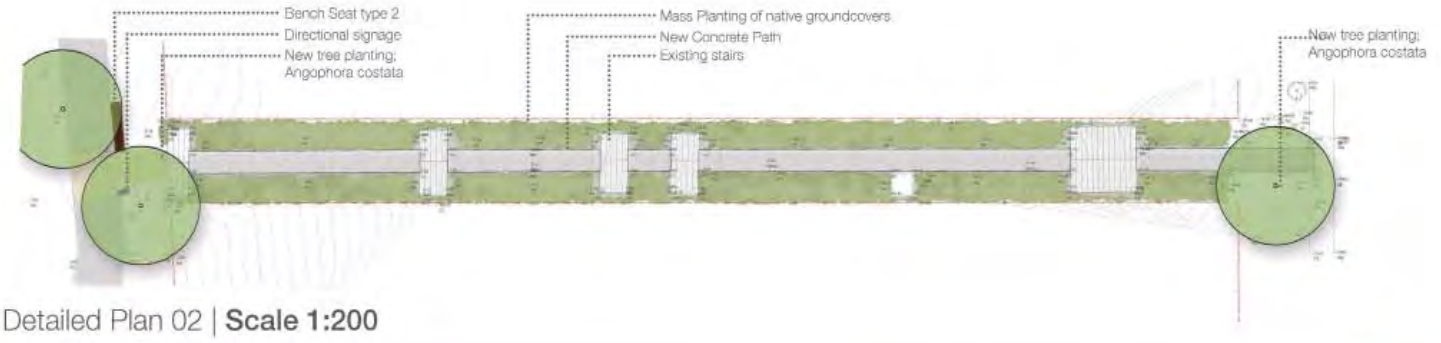
Dwg no. : **11050-L002**
Rev: **C**
Date: **November 2012**

Landscape Master Plan | Development Application

Landscape Plans, Sections & Perspectives | **Bill Mitchell Park**



Detailed Plan 01 | **Scale 1:200**



Detailed Plan 02 | **Scale 1:200**

Section 01 | **Scale 1:100**

Elevation 01 | **Scale 1:100**

Perspective 01 | **Bill Mitchell Reserve looking south**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: **1:500 @ A1**

0 10 20 30 40m

Landscape Master Plan | Development Application

Dwg no. : **11050-L003**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Glades Bay**

Landscape Plan | **Context**

Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. 1.8m wide fiberglass mesh boardwalk with balustrade.
2. Existing dingy storage rack. New 'slip way' ramp into water
3. Upgrade existing stairs; crushed stabilised sandstone path with sandstone stairs
4. Lookout with sandstone flagging and seat.
5. Existing salt marsh to be protected
6. New 1.5m wide Fibreglass mesh boardwalk through bushland. Low profile to existing ground
7. Remove existing fiberglass mesh and replace with crushed stabilised sandstone pathway.
8. Preserve existing aboriginal sites.
9. Existing bridge removed. New bridge located adjacent to protect existing Glochidion trees
10. New surface; fibreglass mesh, on existing bridge structure over creeks.
11. Rest areas with integrated seating in interpretive signage
12. On-grade pathway; crushed stabilised sandstone path, 1.5m wide, with sandstone steps

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

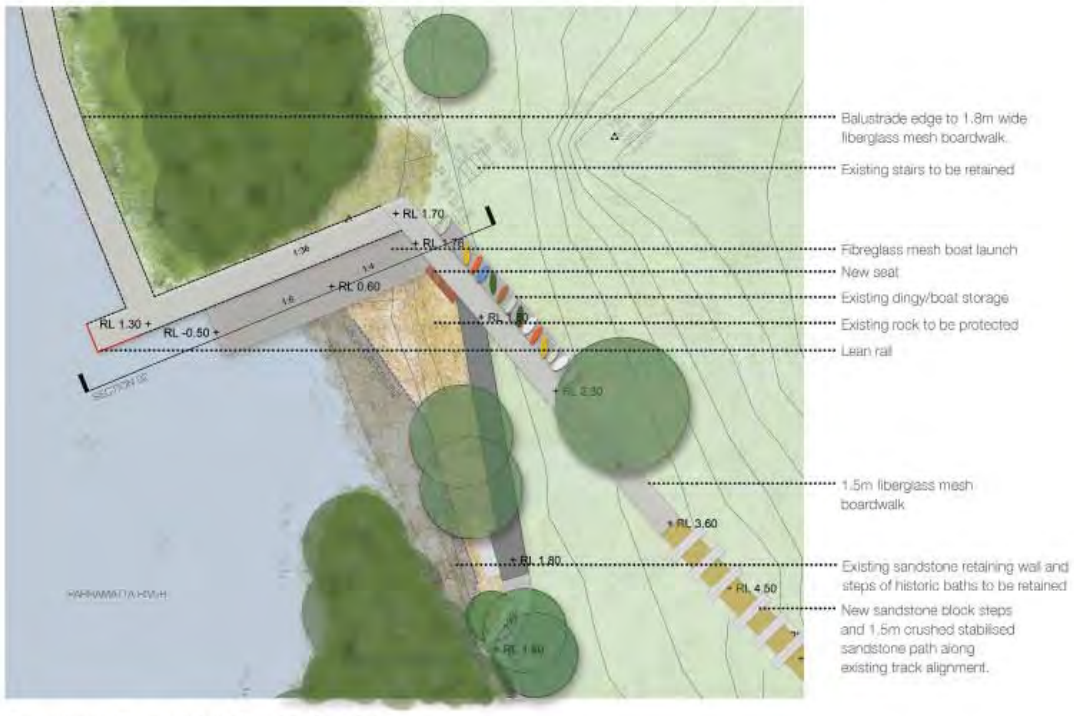
Scale: 1:500 @ A1

0 10 20 30 40m

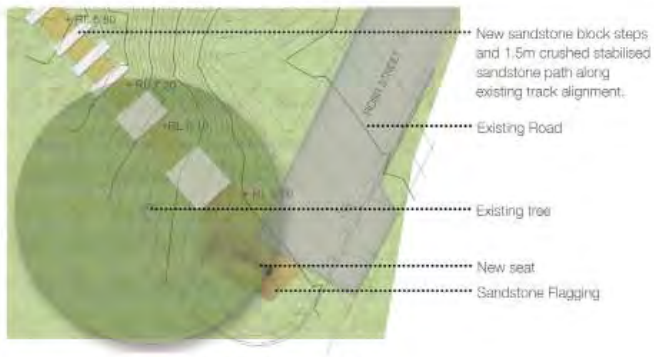
Landscape Master Plan | Development Application

Dwg no.: **11050-L004**
Rev: **C**
Date: **November 2012**

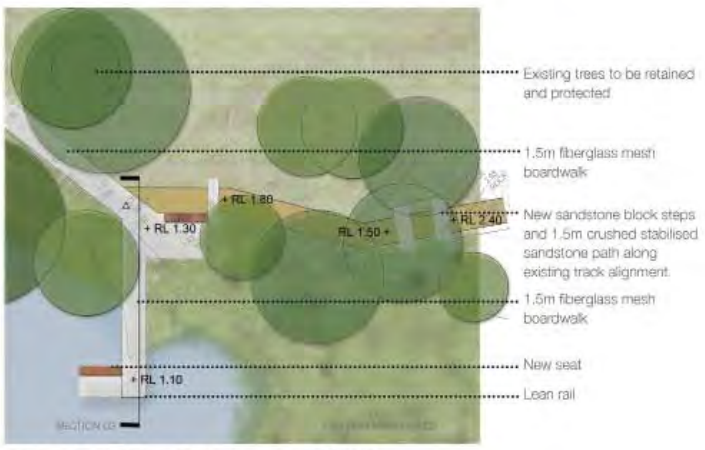
Landscape Sections & Perspectives | **Glades Bay**



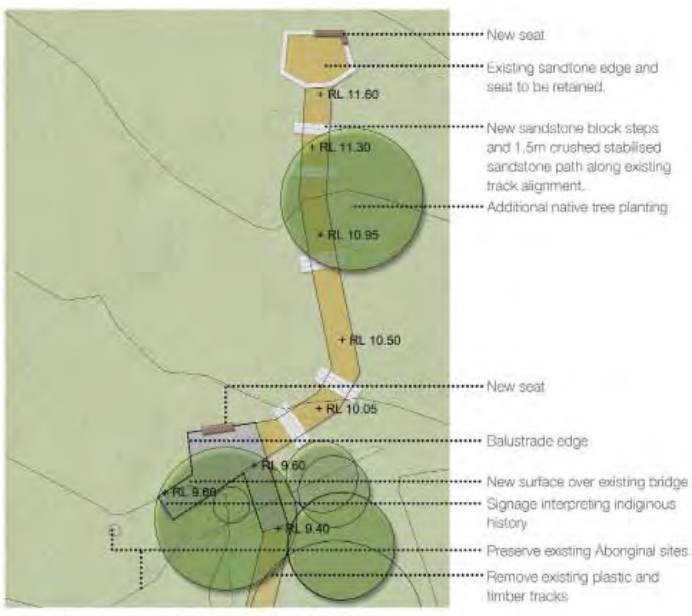
Detailed Plan 03 | **Scale 1:200**



Detailed Plan 04| **Scale 1:200**



Detailed Plan 05| **Scale 1:200**



Detailed Plan 06| **Scale 1:200**

Section 02 | **Scale 1:100**

Section 03 | **Scale 1:100**

Perspective 02 | **Glades Bay Reserve looking south-east**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: **1:500 @ A1**

0 10 20 30 40m

Landscape Master Plan | Development Application

Dwg no.: **11050-L005**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Looking Glass Bay**

Landscape Plan | **Context**

Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. Sydney water sewer pump station
2. Existing salt marsh to be protected.
3. 1.5m wide fiberglass mesh boardwalk with balustrade and lean rail.
4. New entry; concrete unit path with sandstone steps. New tree planting; Angophora costata and Glochidion ferdinandii in native grass understory.
5. Rest area with integrated seating and signage
6. New entry; upgraded lawn and edging, new seats, and existing sandstone flagging entry. New tree planting; Angophora costata and Glochidion ferdinandii in native grass understory.
7. New concrete footpath; 1.5m wide, with decorative sawcuts
8. New crushed stabilised sandstone seating areas and path with integrated seating
9. Connect to existing path in Banjo Patterson Park

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: 1:500 @ A1

0 10 20 30 40m

Landscape Master Plan | Development Application

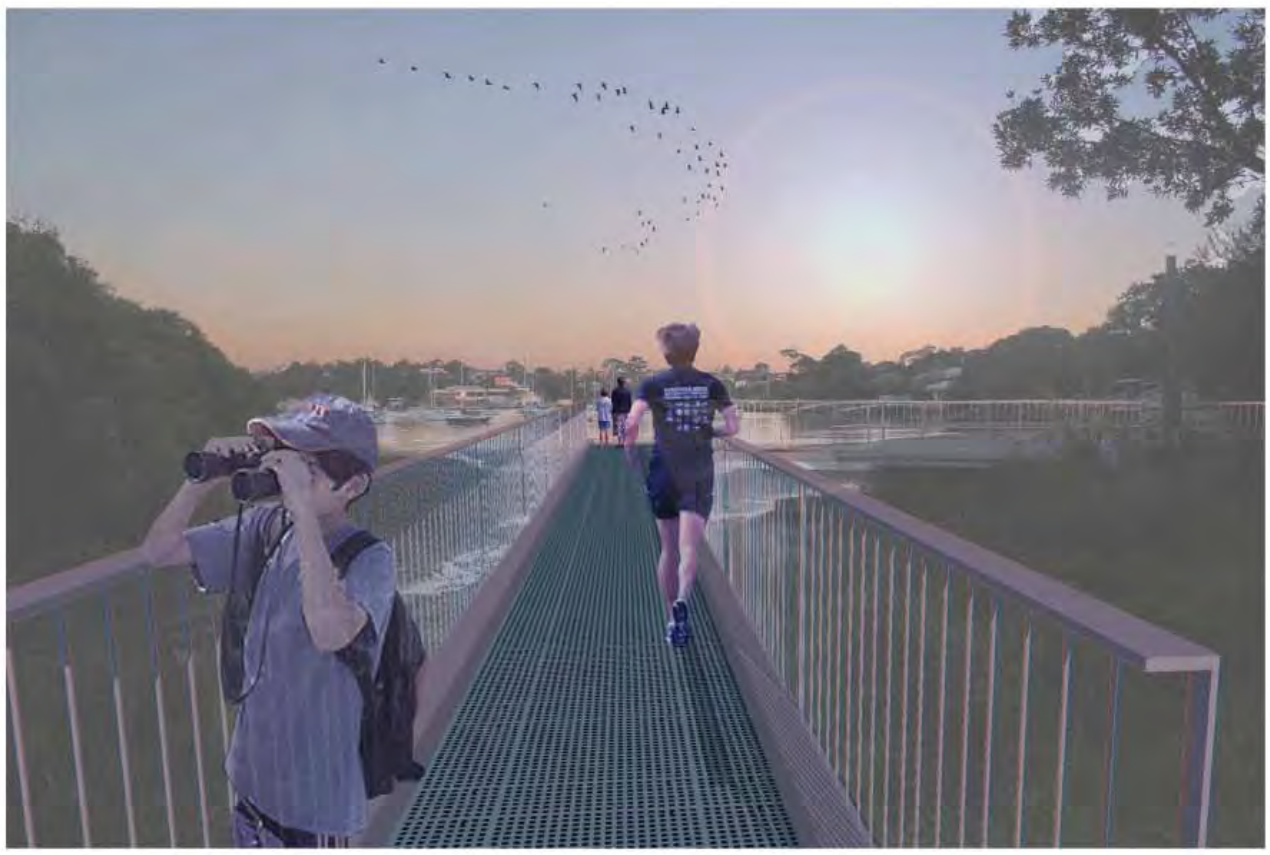
Dwg no.: **11050-L006**
Rev: **C**
Date: **November 2012**

Landscape Sections & Perspectives | **Looking Glass Bay**

Detailed Plan 07| **Scale 1:200**

Section 04 | **Scale 1:100**

Section 05 | **Scale 1:100**



Perspective 03 | **Looking Glass Bay looking South**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde | Drawn: **NB/EO** Checked: **SC** | Scale: **1:500 @ A1** (0, 10, 20, 30, 40m)

Landscape Master Plan | Development Application

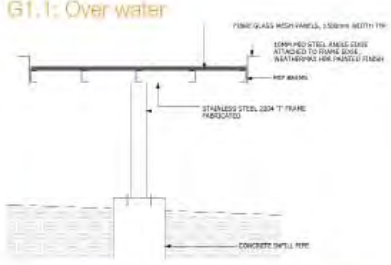
Dwg no. : **11050-L007**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Materials Palette**

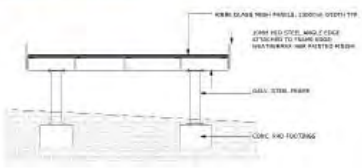
SURFACES & STAIRS

Ground Surface Type 1:
Fibreglass Mesh
- 1.5m wide generally
- 1.8m wide with balustrades
- Used for sections over water or undulating land

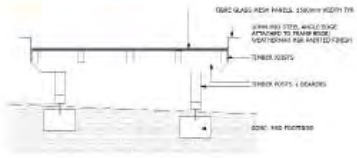
G1.1: Over water



G1.2: On Land

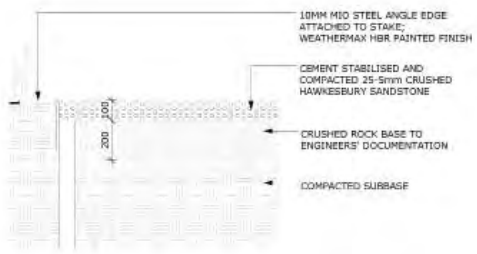


G1.3: On Land



Ground Surface Type 2:
Insitu Concrete Paving
- 1.5m wide
- Decorative diagonal sawcuts at 800mm cts
- Used for on-grade paths where grades exceed 1:20

Ground Surface Type 3:
Crushed Stabilised Sandstone
- 1.5m wide
- Used at entries, rest areas and to water's edge of Bill Mitchell Park



Ground Surface Type 4:
Sandstone Flagging
- Mortar jointed and laid on concrete base
- Used at entries and path junctions

Stairs Type 1:
Sandstone block steps
- 2.6m wide
- Used at entries and within bushland areas

WALLS & SEATS

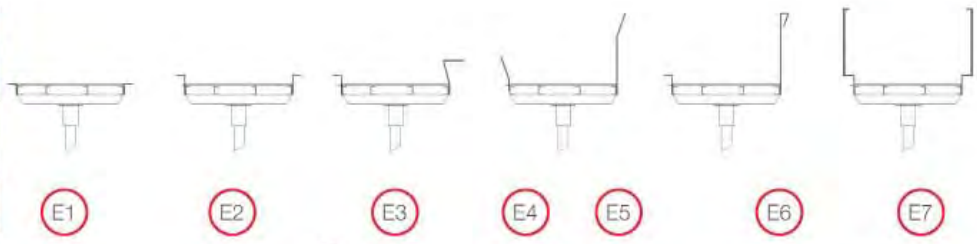
Walls Type 1:
Brick Wall
- Double course brick wall
- Mass concrete footing
- Used at Bill Mitchell Park water's edge

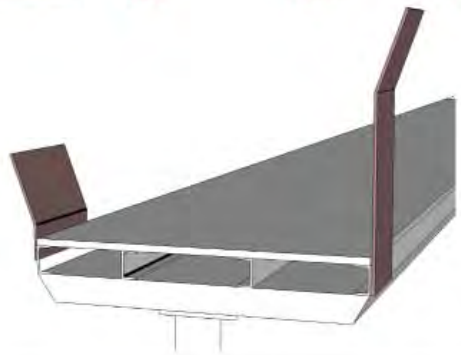
Bench Seat type 1:
Folded steel edge
- With or without backrest
- MIO 10mm folded steel plate
- Installed at edge of boardwalk and rest stops

Bench Seat type 2:
Folded steel with composite battens
- MIO 10mm folded steel frame
- Composite plastic battens
- Attached to wall at Bill Mitchell Park
- Free standing seats at rest stops

EDGES

Folded Steel Edge Treatments:
1. Flush Edge
2. Kickrail
3. Perch Seat
4. Signage Plinth
5. Directional Signage
6. Lean Rail
7. Balustrade





PLANTING

Tree Type 1:
Native Evergreen Tree

Species:
- Eucalytpus botrioydes
- Glochidion ferdinandi
- Angophora costata

Mass Planting Type 1:
Native Understorey Grasses and Groundcovers (0.5m max height)

Species:
- Lomandra longifolia
- Dianella carulea
- dianella prunina
- Isolepis nodosa
- bursaria spinosa
- dodonaea triquetra
- lomandra filiformis
- hardenbergia violacea
- juncus usitatus
- kennedia rubicunda
- banksia serrata
- olearia microphylla
- wahlenbergia ssp.
- hakea dactyloides

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde | Drawn: **NB/EO** | Checked: **SC** | Scale: 1:500 @ A1 (0, 10, 20, 30, 40m)

Landscape Master Plan | Development Application

Dwg no.: **11050-L008**
Rev: **C**
Date: **November 2012**

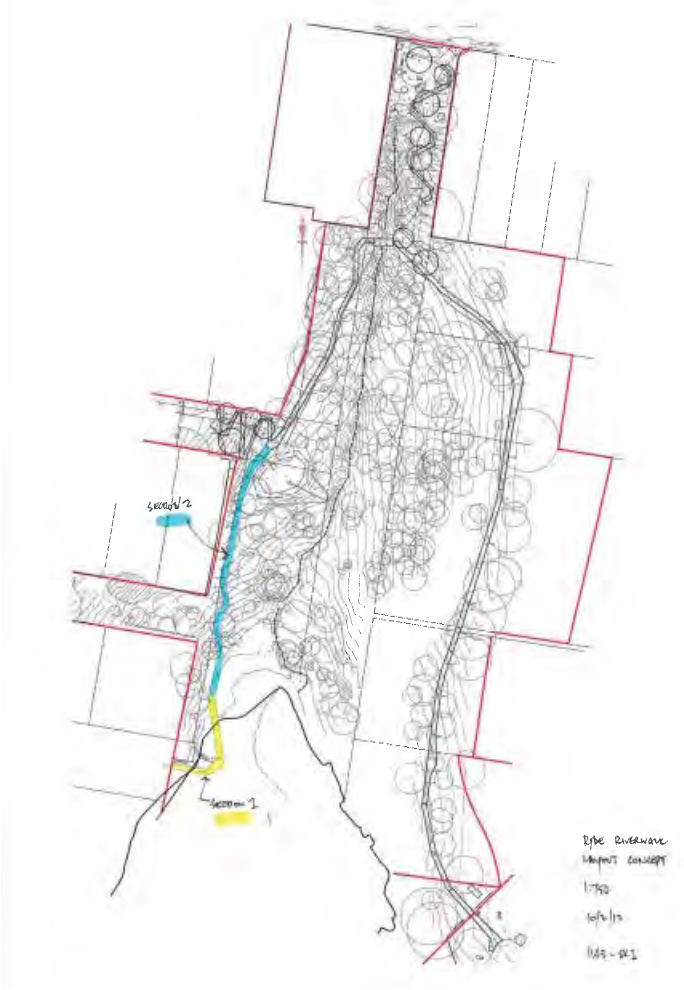
9. Engineering details

7.1 Sketch Engineering details

Ducros Design has worked closely with ASPECT Studios in producing realistic engineering solutions for the boardwalk, particularly those sections spanning the water (see below).

This has been considered in this stage of works to ensure ease of constructability of the boardwalk, estimate costs and highlight any design issues early in the process.

Detailed design will be provided in future stages.



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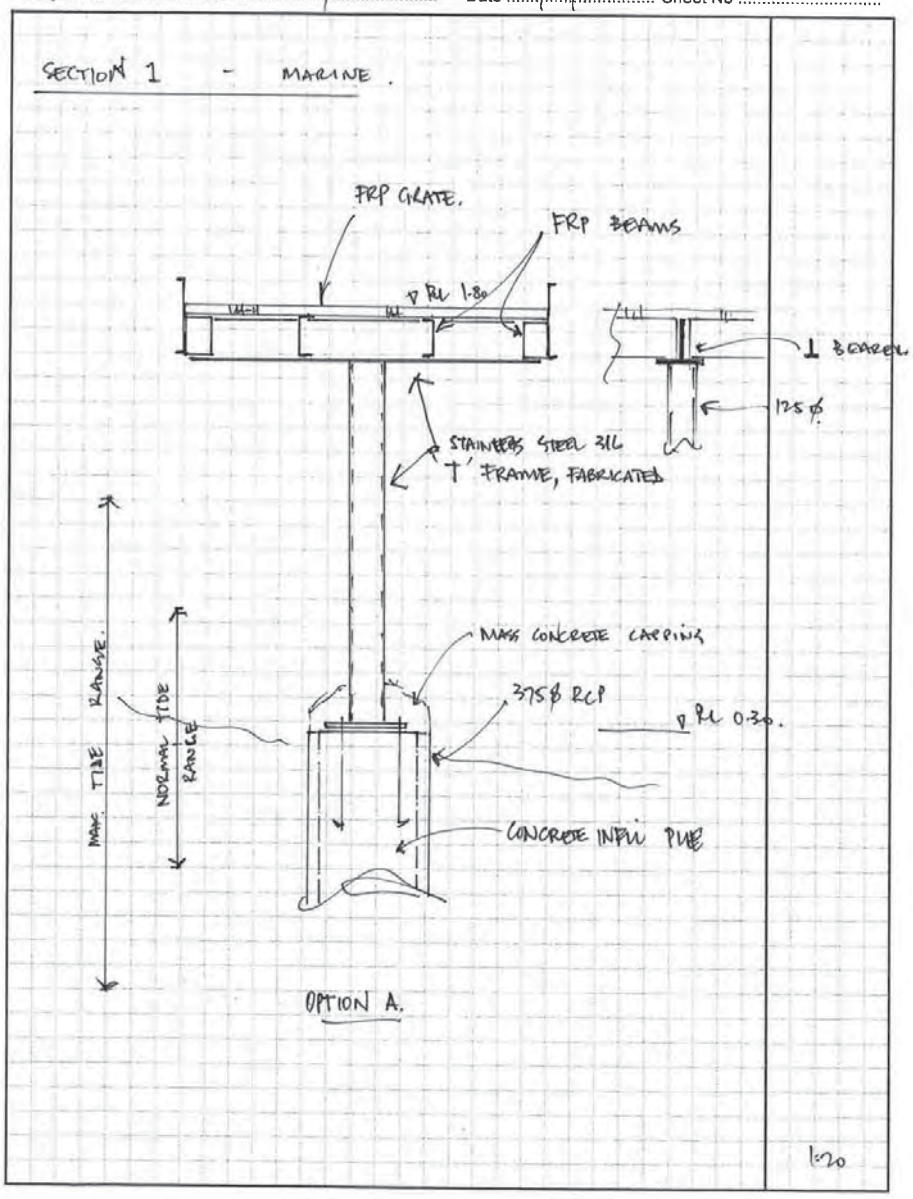
Project RYDE RIVERWALK Designer MdC Project No 1143
Subject LOOKING GLASS BAY Date 10/2/12 Sheet No SK2



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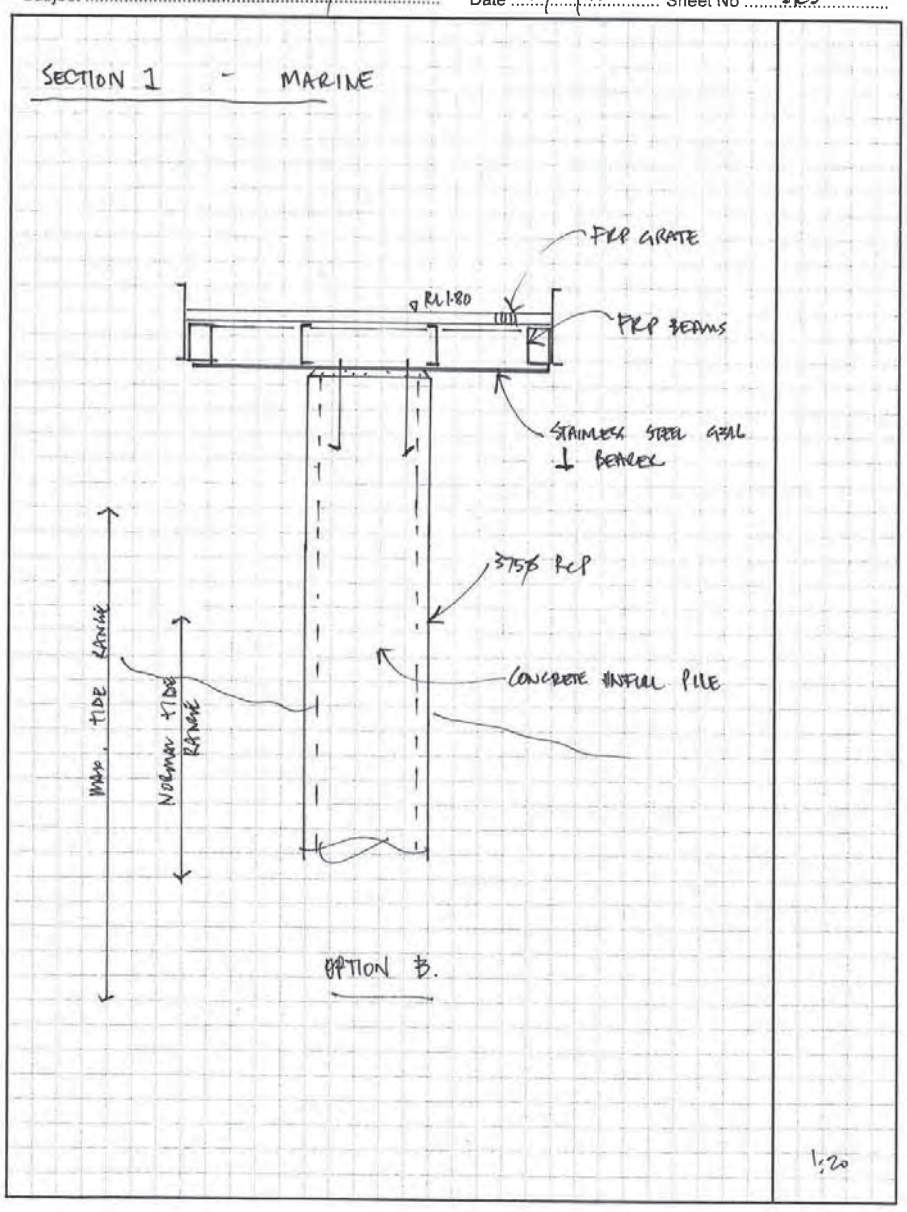
Project RYDE RIVERWALK Designer MdC Project No 1143
Subject LOOKING GLASS BAY Date 10/2/12 Sheet No SK3



10. Costing

10.1 Preliminary cost estimate

Altus Consulting quantity surveyors has worked closely with ASPECT Studios and Ducros Design in producing a cost estimate based on the final Landscape Development Application drawings and sketch Engineering details. A summary of the costs is shown below.

Ryde River Walk
Aspect Studios
Bill Mitchell Reserve, Glades Bay & Looking Glass Bay

		COST CENTRE BREAKDOWN										
ITEM No	DESCRIPTION	1	2	3	3a	4	5	5	6	7	8	Total $
		BM.1	BM.2	GB.3	GB.3a	GB.4	GB.5a	GB.5b	LGB.6	LGB.7	LGB.8	BM/GB/LGB
1	Demolition & Alterations	10,080	1,500	1,500	1,500	2,000	1,000	4,000	1,500	1,500	2,690	27,270
2	Preparatory works	20,154	6,792	2,500	1,200	2,182	9,642	9,008	4,568	4,258	8,958	69,262
3	Walkways	348,540	146,114	443,005	92,665	117,470	242,065	269,470	132,700	289,750	142,235	2,224,014
4	Planting	112,070	18,300	0	0	0	0	0	9,990	6,990	16,290	163,640
5	PRELIMINARIES & MARGIN @ 15%	73,627	25,906	67,051	14,305	18,248	37,906	42,372	22,314	45,375	25,526	372,628
	SUBTOTAL EXCLUDING CONTINGENCIES, FEES, LOCAL AUTHORITY FEES & CHARGES AND GST	**$564,471**	**$198,612**	**$514,056**	**$109,670**	**$139,900**	**$290,613**	**$324,850**	**$171,072**	**$347,873**	**$195,699**	**$2,856,814**
6	DESIGN CONTINGENCIES @ 10%	56,447	19,861	51,406	10,967	13,990	29,061	32,485	17,107	34,787	19,570	285,681
7	CONTRACT CONTINGENCIES @ 5%	31,046	10,924	28,273	6,032	7,694	15,984	17,867	9,409	19,133	10,763	157,125
	SUBTOTAL INCLUDING CONTINGENCIES HOWEVER EXCL FEES, LOCAL AUTHORITY FEES & CHARGES AND GST	**$651,964**	**$229,397**	**$593,734**	**$126,669**	**$161,584**	**$335,658**	**$375,201**	**$197,588**	**$401,793**	**$226,032**	**$3,299,620**

BM Bill Mitchell Reserve
GB Glades Bay
LGB Looking Glass Bay

Exclusions

1 Contaminated or hazardous material
2 Works beyond the existing site boundary
3 Transport delays due to inclement weather
4 Council fees & Charges
5 Local authority contributions
6 Finance costs
7 land acquistion costs
8 Workers utilising on site accommdation
9 GST
10 Design & professional fees
11 Artworks
12 Signage
13 Carbon Tax implications
14 Major diversion of services
15 Insurance bonds associated with damaging trees

Altus PageKirkland

City of Ryde

Statement of environmental effects

RYDE RIVERWALK – LOOKING GLASS BAY

NOVEMBER 2012

ngh environmental

Document Verification

Project Title: Ryde Riverwalk –Looking Glass Bay Statement of environmental effects

Project Number:	2151
Project File Name:	Ryde Parramatta Riverwalk looking glass bay REF final v.1 Nat

Revision	Date	Prepared by (name)	Reviewed by (name)	Approved by (name)
Final v1.0	19/11/12	Raphael Morgan	Natascha Arens	Natascha Arens

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CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 PROPOSAL IDENTIFICATION

The City of Ryde Council proposes to construct a section of the Ryde River Walk Master Plan (Pod Landscape Architecture et al 2007). The Ryde River Walk seeks to connect existing foreshore parks along Parramatta River from Wharf Road to the west to Punt Road to the east in the City of Ryde Local Government Area (LGA). The Master Plan developed a strategy for the staged implementation of the River Walk. This statement of environmental effects (SEE) assesses the Looking Glass Bay River Walk tracks (Figure 1-1).

Figure 1-1 Proposal location and proposed track (Source: Aspect 2012).

The proposal area is characterised by the following:

- Looking Glass Bay Park is a passive recreational park which can be accessed from local roads to the east, west and north. Access to Banjo Patterson Park is located at the south eastern end.
- Looking Glass Bay Park contains remnant urban bushland and is located along the foreshore of Looking Glass Bay. The park includes a series of dirt track linkages and the foreshore includes protected vegetation (mangroves, saltmarsh and seagrass).
- Residential properties with direct views or access to the park.

The proposed works would include:

- Formalisation of existing tracks in Looking Glass Bay Park.
- Construction of a boardwalk linking Bernard Avenue to Looking Glass Bay Park.

Further details of the proposed works are provided in Chapter 3.

The proposal would be funded using contributions from local, state and federal funds.

1.2 PURPOSE OF THE REPORT

This statement of environmental effects (SEE) has been prepared by **ngh**environmental on behalf of City of Ryde Council.

The purpose of the SEE is to describe the proposal, to document the likely impacts of the proposal on the environment, and to detail protective measures to be implemented.

The description of the proposed works and associated environmental impacts have been undertaken in context of Division 2 of the *Environmental Planning and Assessment Act 1979*, the *Threatened Species Conservation Act 1995* (TSC Act), *the Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This proposal is not a designated development as specified under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* and therefore requires a Statement of Environmental Effects (SEE). This SEE has been prepared under Part IV of the EP&A Act and addresses the obligations of the consent authority (City of Ryde) under Section 79C.

2 OBJECTIVES AND OPTIONS CONSIDERED

2.1 STRATEGIC SETTING

The Ryde River Walk Master Plan (Pod Landscape Architecture et al 2007) (the Master Plan) adopted by Council has been progressively implemented since 2007. The purpose of the Master Plan was to provide an opportunity to create an engaging and important regional route along the Parramatta River foreshore and to link existing parks, reserves and public spaces through a regional system of recreational trails. It was prepared with input from local residents and interest groups.

The Master Plan was based on strategic government planning instruments and guidelines such as:

- Sharing Sydney Harbour Access Plan (DIPNR 2003)
- Sydney Harbour Catchment Sydney Regional Environmental Plan (DoP 2005)
- Sydney Metropolitan Recreational Trails Framework (DIPNR 2005, updated 2011)
- Walking Sydney Harbour (State and Local Government)
- Metro Strategy (DoP 2005)
- Australian National Cycling Strategy 2005-2012 (Austroads 2005)

The objectives of the Master Plan included:

- Public Health Benefits:
  - Reinforce the link between the environment and the health of the community members.
  - Increase the range of users in terms of age, fitness and physical ability.
  - Link to health initiatives- encouraging walking, cycling as a means of transport though linking uses.
- Recreational benefits:
  - Increase use and connectivity between open spaces.
  - Increase legibility of a network of trails around the foreshore of Ryde LGA.
  - Increase regional recreational areas.
- Ecological Enhancement:
  - Link to initiatives that improve the physical environment.
  - Increase the understanding of the ecological values of the area.
- Transport:
  - Increase the networks of routes.
  - Provide increase in access to sites.
- Cultural vitality:
  - Creating events and community programs.
- Educational value:
  - Increase understanding through interpretation of our history.
  - Increase understanding of the ecology and cultural values of the Parramatta River.

Looking Glass Bay Park forms part of the Master Plan and is one of the last four remaining park upgrades to complete the entire Ryde River Walk (the other three are Glades Bay Park, Bill Mitchell Park and Banjo Patterson Park).

2.2 PROPOSAL OBJECTIVES

The objectives of the proposal are to:

- Implement the Ryde River Walk Master Plan.
- Provide an intimate scaled pathway that formalises an existing trail.
- Maximise the extent of an accessible pathway for all users where slopes permit (e.g. wheelchair access).
- Respect the neighbouring property interface through careful siting of the pathway and boardwalk.
- Locate and design the pathway to minimise impact on vegetation. Locating the pathway away from the most important vegetation communities (mangroves, saltmarsh and seagrass).
- Provide a variety of experiences along the pathway, with opportunities to rest, read about the local history and absorb the views.
- Provide a design that is unique to Ryde, and unified in its character.
- Provide a scheme that is sustainable; is robust and achieves a 50 year life span.
- Enhance the natural environment through provision of additional tree and understorey planting.

2.3 OPTIONS CONSIDERED

Three options have been considered by Council in regards to the Ryde Riverwalk through Looking Glass Bay Park.

2.3.1 Consideration of alternatives

Option 1: Do nothing

The 'Do Nothing' option would maintain the existing park condition.

Option 2: Upgrade Looking Glass Bay Park with no formalised link between Bernard Avenue and the park.

This option would include the upgrade of existing paths and accesses to the park. However, a boardwalk would not be constructed to formalise the connection between Bernard Avenue and the park.

The option's characteristics include the following:

- Formalisation of existing dirt paths using various materials such as concrete and sandstone.
- Avoiding the mangrove stands.

Option 3 (preferred option): Upgrade Looking Glass Bay Park and provide boardwalk link between Bernard Avenue and the park.

This option would include the upgrade of existing paths and accesses to the park and include a boardwalk to formalise the connection between Bernard Avenue and the park.

The option's characteristics include the following:

- Formalisation of existing dirt paths using various materials such as concrete and sandstone.
- Elevated boardwalk in the intertidal zone between high and low tide connecting Bernard Avenue to the park.
- Avoiding the mangrove stands.

Table 2-1 provides an analysis of the disadvantages and advantages of each option.

2.4 PREFERRED OPTION

Options 2 and 3 would meet the objectives of the proposal. However, options 3 would improve access to the park by adding an additional formalised path from Bernard Avenue. The proposed boardwalk would also improve the protection of the saltmarsh at this location which is currently impacted by trampling due to informal access. Based on the options analysis (Table 2-1), option 3 is the preferred option.

Table 2-1 Options analysis

	Option 1	Option 2	Option 3 (preferred option)
Advantages	• No construction costs • Minimal visual impacts	• Formalises existing paths which would minimise potential disturbances to vegetation. • No disturbance of sediments and potential water quality impacts as there would be no boardwalk over the water.	• Formalises existing paths which would minimise potential disturbances to vegetation. • Potential for the reestablishment of protected saltmarsh and its habitat previously disturbed through uncontrolled access at Bernard Avenue.
Disadvantages	• Continued degradation of the protected saltmarsh through trampling as a result of unformalised access near Bernard Avenue.	• Continued degradation of the protected saltmarsh through trampling as a result of unformalised access near Bernard Avenue. • Some construction costs (though lower than option 3).	• Potential for temporary disturbance of sediments and water quality impacts in Looking Glass Bay during construction of boardwalk. • Some visual impacts as a result of a boardwalk over the water. • Highest construction costs compared to other options.
Does the option comply with the Master plan?	No	Yes	Yes
Does the option meet the proposal objectives?	No	Partial	Yes

3 DESCRIPTION OF THE PROPOSAL

3.1 EXISTING ENVIRONMENT

Below is a brief description of the environment and the features on site. Site photographs are provided in Appendix A.

Looking Glass Bay Park:

Looking Glass Bay Park is a 2.1 hectare remnant of bushland on the Parramatta River foreshore. The park is in a gully with a creek running north to south. The vegetation has been described as coastal sandstone gully forest with estuarine (mangroves, saltmarsh) communities located along the foreshore of Glades Bay (refer to section 5.3 for further description of the ecology of the park) (Godden Mackay Logan 2009). The vegetation is dense in the centre of the park while the perimeter of the park is mostly grassed and contains isolated trees. Access tracks through the perimeter of the park are made of compacted soil with a small one span wooden bridge crossing the creek at the northern end of the park.

The park can be accessed via Banjo Paterson Park to the east, Ashburn Place to the north, Amiens Streets to the west and Bernard Avenue to the south west (though this last access is not formalised and access to the park traverses the intertidal zone).

A bio retention basin is at the end of Amiens Street, at the bottom of a steep hill. The mulched slope helps to direct overland flow of water into the basin. During heavy rainfall, excess water is able to pond in the basin and slowly filter through the sandy soil. The native vegetation planted in the basin also assists in filtering the water and absorbing nutrients.

The surrounding land use of the proposal area is predominantly low density residential properties.

3.2 CONSTRUCTION ACTIVITIES

3.2.1 The Proposal

A concept design is provided in Appendix B.

Concrete and crushed sandstone paths 1.5 metres wide would be laid around the perimeter of Looking Glass Bay Park joining with the existing path at Banjo Paterson Park. The paths would generally follow the existing informal paths. Seating would be provided along the path.

Concrete path with sandstone steps would be constructed to facilitate access from Amiens Street to Looking Glass Bay Park.

A raised 1.5 metre wide fibreglass mesh boardwalk would be constructed joining Bernard Avenue with Amiens Street. The boardwalk would span the coastal saltmarsh community.

Native and exotic vegetation would be planted along certain sections of the path, in particular at the Amiens Street and Ashburn Place entrances.

3.2.2 Construction methodology

There is a potential for the proposed works to be undertaken in stages, depending on available funding. The final construction methodology would be refined during detailed design and following selection of a construction contractor. The following activities would be required:

- Establishment of erosion and sedimentation controls.
- Establishment of compound and stockpiles sites (refer to section 3.2.7).
- Profiling of proposed paths using excavator.
- The exposed soil subgrade over proposed paved areas and crushed sandstone surfaced pathways would be proof rolled. Proof rolling would assist in improving the near surface compaction of the soils and assist in identifying any soft or unstable areas. The use of hand held vibrating plate compactors (wacker packers) may be required in areas with restricted access.
- Construction of concrete and sandstone footpaths. Concreting would be undertaken on site. Paths would be 1.5 metres wide.
- Construction of a raised boardwalk and stairs over land between Amiens Street and the intertidal zone near Bernard Avenue. The raised boardwalk would require small excavations (less than 1 metre deep) to create concrete footings for the piles as per Figure 3-1. The boardwalk would include a pre fabricated fibre glass mesh platform and timber and/or galvanised steel posts.

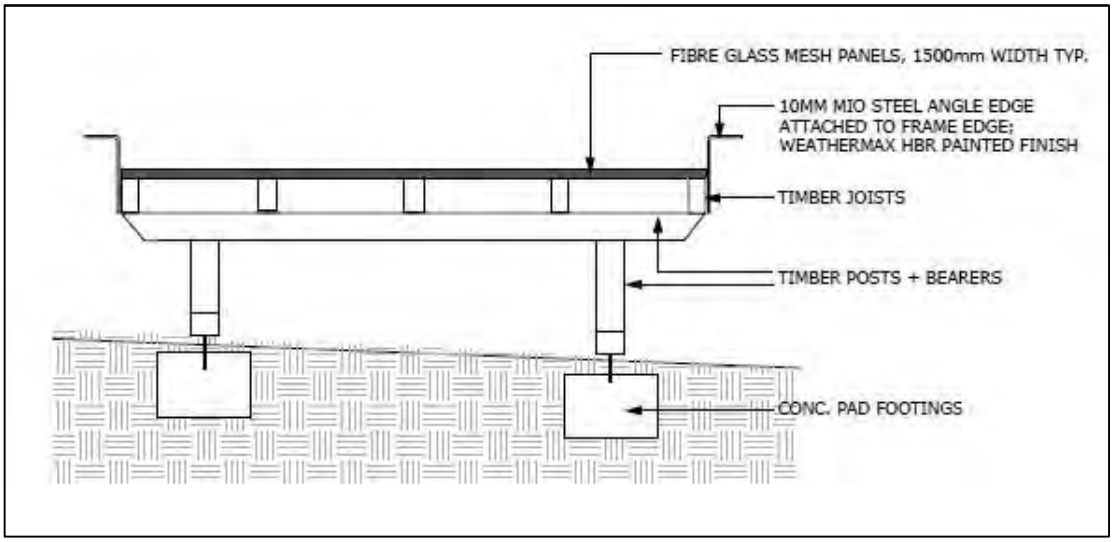


Figure 3-1: Typical cross section of boardwalk on land

- Replacement of the bridge over the creek with a new platform similar to the raised boardwalk described above.
- Construction of a raised boardwalk over the intertidal zone joining Bernard Avenue to Looking Glass Bay Park. The boardwalk would require the use of a piling rig on a barge which would access the area only during high tides and would be removed and anchored in deeper waters off Looking Glass Bay during low tides. Hollow piles would be driven through the sediment to rock. The pile casings would be vacuumed out with the sediment stored in bins to be appropriately disposed of. The inner piles would be reamed out into the rock to form a pile anchorage and the

pile would be reinforced and concreted as per Figure 3-2 below. A fibre glass mesh platform would be fixed to the piles. No piling would occur within the saltmarsh or seagrass with the boardwalk spanning the saltmarsh to avoid any impacts.

- Installation of seating at strategic locations along the new paths (refer to Appendix B for locations).
- Landscaping of certain sections including planting of trees and native grass understorey. This would be undertaken at the Amiens Street and Ashburn Place entrances.

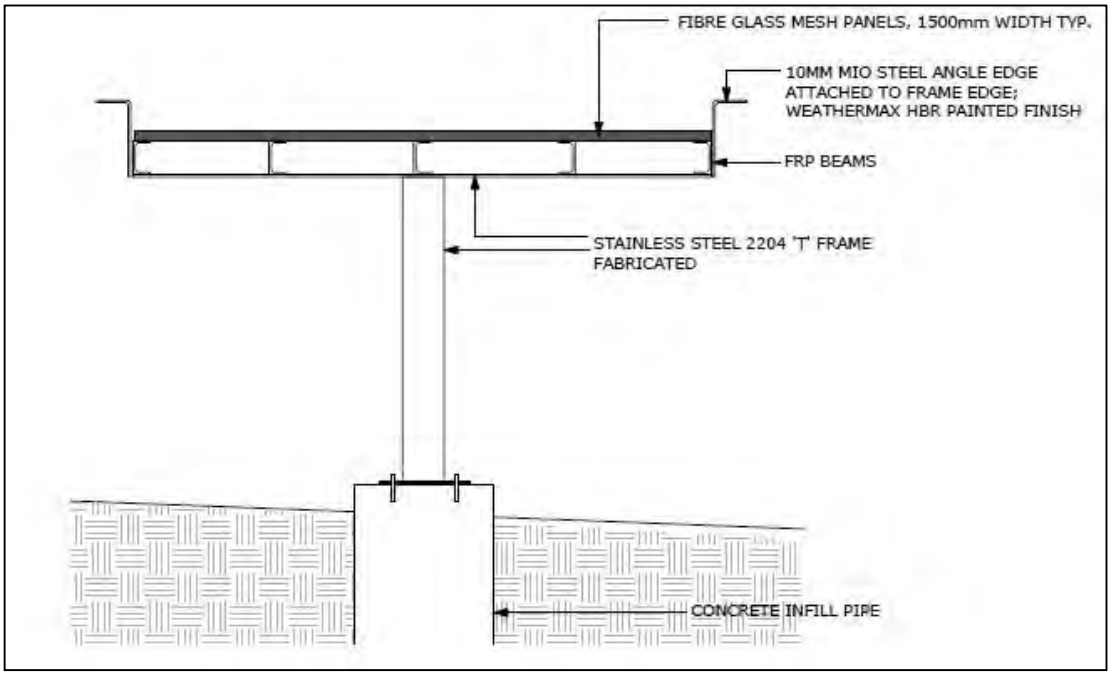


Figure 3-2: Typical cross section of boardwalk over water

3.2.3 Plant and equipment

- Light vehicles (4 wheel drive)
- Trucks
- Piling rig (driven)
- Bobcat T250 loader
- Bobcat E35 excavator
- Argo 6x6 Frontier 580 vehicle (All Terrain Vehicle)
- Small concrete truck
- Roller
- Wacker packer
- Hand held power tools

3.2.4 Earthworks

Earthworks would be limited with no major excavation required. The paths would be built to existing ground level. The ground may need to be profiled in some areas to build the paths and any stairs, especially near Amiens Street and Ashburn Place. Minor excavation (less than 1 metre deep) would be required for the boardwalk footings.

3.2.5 Traffic and access

The proposed works would require construction vehicles and delivery trucks to access areas as close to the site as possible. Access would be via Bernard Avenue, Amiens Street, Ashburn Place and through Banjo Paterson Park.

3.2.6 Public utility adjustment and property acquisition

Utilities are located in proximity to the proposed works including underground stormwater pipes and man holes and a Sydney Water sewer pump station at the end of Bernard Avenue. No public utility adjustment would be required for the proposed works. No property acquisition would be required. A section of the boardwalk would be below Mean High Water Mark which is managed by the Roads and Maritime Services (RMS) (Maritime division). Council would be required to enter into a tenure agreement for the use of this land.

3.2.7 Ancillary Facilities

Compound Site

The location of the required compound site has not been decided. Once a site has been chosen the council environment manager would assess the site and potential impacts and determine any management measures for its establishment and its removal. The following provides guidance for the selection of an appropriate site:

- The compound site would be established on level ground away from any drainage lines and drain inlets.
- The compound site would be established at least 40 metres from any waterways.
- No vegetation would be cleared for the establishment of the compound site and it would not be established underneath the dripline of any trees.
- Preference would be given to establishing the compound site on existing hardstand area.
- The compound site would be established away from residences.

3.2.8 Construction hours and time frame

The proposed works would be conducted within standard working hours only. No night works would be required

Standard working hours:
Monday to Friday – 7AM to 5PM
Saturday- 8AM to 1PM
Sundays and Public Holidays- No work

The construction period and total duration of works is unknown. There is a potential for the proposed works to be undertaken in stages. This would depend on available funding.

4 STATUTORY AND PLANNING FRAMEWORK

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

This proposal is not a designated development as specified under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* and therefore requires a Statement of Environmental Effects (SEE). This SEE has been prepared under Part 4 of the EP&A Act and addresses the obligations of the consent authority (City of Ryde Council) under Section 79C. The development activity requires consent; however the proposal is integrated development as it may requires an approval (permit) under the *Fisheries Management Act 1994* (s *219*).

The proposal has the potential to impact on various aspects of the environment. Schedule 1, Part 1, Section 2 (4) of the *Environmental Planning and Assessment Regulation 2000*, identifies that an SEE must indicate the following matters:

(a) the environmental impacts of the development,

(b) how the environmental impacts of the development have been identified,

(c) the steps to be taken to protect the environment or to lessen the expected harm to the environment,

(d) any matters required to be indicated by any guidelines issued by the Director-General for the purposes of this clause.

This SEE has taken into account the principles and objectives according to the statutory requirements specified under Part 4 of the EP&A Act and Schedule 1 of the EP&A Regulation, to consider environmental impact.

In preparing this SEE, the Department of Urban Affairs and Planning Best Practice Guidelines for Part 5 of the *Environmental Planning and Assessment Act 1979* "*Is an EIS Required*" has been utilised as a guide, to ensure that issues relevant to the NSW Office of Environment and Heritage (OEH) have also been addressed.

City of Ryde is proposing to assess the development under Part 4 of the EP&A Act. Division 2 of Part 4 describes the procedure for development requiring consent. For the purpose of the development, City of Ryde is the consent authority for works above the mean high water mark and RMS (Maritime division) is the consent authority for works below the mean high water mark.

4.2 STATE ENVIRONMENTAL PLANNING POLICIES

4.2.1 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (deemed SEPP since 1 July 2009)

Looking Glass Bay, where the boardwalk over the water would be located is in the area covered by Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (SREP Sydney Harbour Catchment). The location of the proposed works is zoned W8 Scenic Waters Passive Use.

Any development carried out below the mean high water mark such as the proposed boardwalk is classed as water-based development. Clause 5 states that the consent authority for water based

development is NSW Roads and Maritime Services (Maritime division). Public boardwalks may be carried with consent within the zone W8.

Under Division 2 of SREP Sydney Harbour Catchment the flowing matters must be considered by a consent authority assessing an activity under Part 4 of the EP&A Act:

- Biodiversity, ecology and environmental protection
- Public access to, and use of, foreshores and waterways
- Maintenance of a working harbour
- Interrelationship of waterway and foreshore uses
- Foreshore and waterways scenic quality
- Maintenance, protection and enhancement of views
- Boat storage facilities

These matters have been considered in this SEE and the development of management measures.

4.2.2 State Environmental Planning Policy No. 19 – Bushland in Urban Areas

The general aim of this policy is to protect and preserve bushland within the *Schedule 1* listed urban areas. This State Environmental Planning Policy (SEPP) applies to the Ryde LGA.

The specific aims of this policy are:

(a) to protect the remnants of plant communities which were once characteristic of land now within an urban area,

(b) to retain bushland in parcels of a size and configuration which will enable the existing plant and animal communities to survive in the long term,

(c) to protect rare and endangered flora and fauna species,

(d) to protect habitats for native flora and fauna,

(e) to protect wildlife corridors and vegetation links with other nearby bushland,

(f) to protect bushland as a natural stabiliser of the soil surface,

(g) to protect bushland for its scenic values, and to retain the unique visual identity of the landscape,

(h) to protect significant geological features,

(i) to protect existing landforms, such as natural drainage lines, watercourses and foreshores,

(j) to protect archaeological relics,

(k) to protect the recreational potential of bushland,

(l) to protect the educational potential of bushland,

(m) to maintain bushland in locations which are readily accessible to the community, and

(n) to promote the management of bushland in a manner which protects and enhances the quality of the bushland and facilitates public enjoyment of the bushland compatible with its conservation.

In accordance with clause 6, a person shall not disturb bushland zoned or reserved for public open space purposes without the consent of the council. Furthermore, a consent authority shall not consent to the carrying out of development unless:

(a) it has made an assessment of the need to protect and preserve the bushland having regard to the aims of this Policy,

(b) it is satisfied that the disturbance of the bushland is essential for a purpose in the public interest and no reasonable alternative is available to the disturbance of that bushland, and

(c) it is satisfied that the amount of bushland proposed to be disturbed is as little as possible and, where bushland is disturbed to allow construction work to be carried out, the bushland will be reinstated upon completion of that work as far as is possible.

The proposed works are for the purpose of formalising existing paths within Looking Glass Bay Park. The works are unlikely to cause damage to the bushland in the park. The specific aims of this SEPP have been taken into consideration when preparing this statement of environmental effects.

4.3 LOCAL ENVIRONMENTAL PLANS

4.3.1 Ryde Local Environmental Plan 2010

The proposed works are located within the Ryde Local Government Area (LGA) on land zoned as E2 environmental conservation, RE1 public recreation and R2 low density residential. A list of the required work activity within the zones is provided in Table 4-1.

The draft LEP 2011 is currently on public exhibition.

Table 4-1: Zoning and consent requirements (Source: NSW Legislation 2011).

Zone	Category	Relevant objectives	Relevant work activity	Consent requirements:
E2	Environmental conservation	• To protect manage and restore areas of high ecological, scientific, cultural or aesthetic values. • To prevent development that could destroy, damage or otherwise have an adverse effect on those values	Formalisation of existing paths	Environmental facilities are permitted with consent.
RE1	Public recreation	• To enable land to be used for public open space or recreational purposes. • To provide a range of recreational settings and activities and compatible land uses. • To protect and enhance the natural environment for recreational purposes. • To protect and enhance the natural bushland in a way that enhances the quality of the bushland and facilitates public enjoyment of the bushland in a way that is compatible with its conservation.	Formalisation of existing paths Construction of new boardwalk	Environmental facilities and recreation areas are permitted with consent.
R2	Low density residential	• To provide for the housing needs of the community within a low density residential environment.	Formalisation of existing paths and landscaping	Recreation areas permitted with consent.

Zone	Category	Relevant objectives	Relevant work activity	Consent requirements:
		• To enable other land uses that provide facilities or services to meet the day to day needs of residents. • To ensure that the general low density nature of the zone is retained and that development for the purposes of dual occupancy (attached) and multi dwelling housing (attached) do not significantly alter the character of a location or neighbourhood. • To ensure that new development complements or enhances the local streetscape. • To maintain on sites with varying topography the two storey pitched roof form character of dwelling houses and dual occupancy (attached) developments. • To ensure that land uses are compatible with the character of the area and responsive to community needs.		

The Ryde Local Environmental Plan (LEP) contains a number of special provisions. The clauses that are relevant to the proposed works include:

Clause 5.7 Development below mean high water mark.

Development consent is required to carry out development on any land below the mean high water mark of any body of water subject to tidal influence (including the bed of any such water). A section of the boardwalk would be located below the Mean High Water Mark.

Clause 5.9 Preservation of trees or vegetation.

A person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any tree or other vegetation to which a development control plan applies without the authority conferred by development consent or a permit granted by the Council.

The City of Ryde Development Control Plan (DCP) 2010 Part 9.6 Tree preservation applies to the trees within Looking Glass Bay Park. The DCP states that the following works are exempt works:

- Tree works on a tree on land owned or under the care, control and management of council where the tree works are carried out by council.

Therefore the works are considered exempt works.

Tree works include:

- Any pruning of the crown of a tree (except for deadwood in accordance with section 2 of this part of the DCP).
- Any removal of a tree.
- Any pruning or removal of roots (greater than 40mm in diameter) from a tree inside it's tree protection zone.

- Any alteration (excavation or fill) to the soil level within the tree protection zone of a tree on the land or on adjoining land.

Clause 6.1 Acid sulphate soils

Development consent is required for certain types of works depending on the class of land identified on the council's acid sulphate soils map. Looking Glass Bay Park is identified as a Class 2 land while surrounding areas (except for the bed of Looking Glass Bay) are Class 5 land.

Development consent is required on class 2 land for works below the natural ground surface or works by which the watertable is likely to be lowered. Some works below the natural ground surface would be required as part of the works in Looking Glass Bay. However, development consent is not required under this clause to carry out any works unless:

(a) the works involve the disturbance of more than 1 tonne of soil, such as occurs in carrying out agriculture, the construction or maintenance of drains, extractive industries, dredging, the construction of artificial water bodies (including canals, dams and detention basins) or foundations or flood mitigation works, or

(b) the works are likely to lower the watertable.

The works are unlikely to trigger either (a) or (b) and therefore consent is not required.

Development consent is required on class 5 land for works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land. While works in this class of land would be within 500 metres of Class 2 land they are unlikely to lower the watertable below 1 metre Australian Height Datum on the adjacent Class 2 land. Consent is not required.

Clause 6.2 Earthworks

Development consent is required for earthworks unless:

(a) the work does not alter the ground level (existing) by more than 300 millimetres, or

(b) the work is exempt development under this Plan or another applicable environmental planning instrument, or

(c) the work is ancillary to other development for which development consent has been given.

Earthworks are ancillary to the proposed development for which consent is required.

4.3.2 City of Ryde Development Control Plan (DCP) 2010

The Development Control Plan (DCP) 2010 provides guidelines, objectives and controls for people who wish to carry out development in the City of Ryde. Table 4-2 provides the provisions of the DCP which are relevant to the proposal.

The draft DCP 2011 is currently on public exhibition.

Table 4-2: Relevant City of Ryde Development Control Plan (DCP) 2008 provisions

DCP provision	Objectives	Response
Part 2.1 Notification of development applications	The objectives of this Part are to: a. outline the public exhibition and notification procedures for development applications, applications to modify development consents and applications to review Council's determinations, b. provide opportunity for people who may be affected by a development proposal to have their comments about the proposal considered by the Council, and to c. identify 'advertised development'.	Section 4 of this SEE relates to community consultation. The consultation would be undertaken in accordance with the provisions of this part.
Part 7.2 Waste Minimisation and Management	The objectives of this part in pursuit of sustainable waste management are: Waste minimisation: 1. To minimise resource requirements and construction waste through reuse and recycling and the efficient selection and use of resources. 2. To minimise demolition waste by promoting adaptability in building design and focussing upon end of life deconstruction. 3. To encourage building designs, construction and demolition techniques which minimise waste generation. 4. To maximise reuse and recycling of household waste and industrial/commercial waste. 5. To assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans. 6. To minimise the overall environmental impacts of waste and foster the principles of ecologically sustainable development (ESD). Waste management: 1. To assist applicants in planning for sustainable waste management, through the preparation of a site waste minimisation and management plan. 2. To assist applicants to develop systems for waste management that ensure waste is transported and disposed of in a lawful	This part applies to engineering works and construction of structures and therefore applies to the proposal. Section 5.11. relates to waste management and has taken into consideration this part of the DCP.

DCP provision	Objectives	Response
	manner. 3. To require source separation, design and location standards which complement waste collection and management services offered by the relevant service providers. 4. To provide guidance in regards to space, storage, amenity and management of waste management facilities. 5. To ensure waste management systems are easy to use and access. 6. To minimise risks associated with waste management at all stages of development.	

4.4 OTHER RELAVENT LEGISLATION

4.4.1 Threatened Species Conservation Act 1995 (TSC Act)

The *Threatened Species Conservation Act 1995* aims to conserve and protect certain classes of threatened, endangered and vulnerable species, populations and ecological communities.

An assessment of the potential impacts of the proposal on threatened species, populations, ecological communities and critical habitat listed in the TSC Act must be undertaken in accordance with section 5A of the EP&A Act (7 part test). Impacts to biodiversity are assessed in section 6.

4.4.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act of 1974* aims to conserve nature, habitat, ecosystems, ecosystem processes and biological diversity at the community, species and genetic levels. Under this Act all native fauna is protected, threatened or otherwise. Schedule 13 of the act lists protected plants which shall not be harmed or picked on any land either on or off National Park estate.

With regard to threatened species a person must not:

(a) harm any animal that is of, or is part of, a threatened species, an endangered population or an endangered ecological community, or

(b) use any substance, animal, firearm, explosive, net, trap, hunting device or instrument or means whatever for the purpose of harming any such animal.

The National Parks and Wildlife Amendment Act 2010

This Act is to amend the *National Parks and Wildlife Act of 1974*, the *Threatened Species Conservation Act 1995* and various other acts to make further provision to include the protection of Aboriginal objects and places. The changes include new offences relating to harm, or desecration of, an Aboriginal object or declared Aboriginal Place. Harm includes destroying, defacing damage or moving items or places without consultation.

The Due Diligence code of Practise for the protection of Aboriginal Objects in NSW (DECCW 2010) was introduced to assist individual and organisations to exercise due diligence when carrying out activities that have the potential to harm Aboriginal Objects and to determine whether they should apply for

Aboriginal Heritage Impact Permit (AHIP). An assessment of potential impacts to Aboriginal heritage items has been undertaken in section 6.

4.4.3 Fisheries Management Act 1994 (FM Act)

The FM Act provides conservation for fish and fish habitats and outlines approval processes for the activities that may impact on threatened species and habitats.

A permit under Part 7 of the FM Act is required if any dredging or reclamation works are to be undertaken unless these works are approved by another relevant public authority (other than a council) in which case the Minister for Primary Industries needs to be notified in accordance with Section 199 of the FM Act.

Reclamation works mean any works that involves:

(a) Using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber or rocks) to fill in or reclaim water land, or

(b) Depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or

(c) Draining water from water land for the purpose of its reclamation.

Water land means land submerged by water:

(a) Whether permanently or intermittently, or

(b) Whether forming an artificial or natural body of water, and includes wetlands and any other land prescribed by the regulations as water land to which this Division applies.

The proposed works would involve reclamation due to the construction of a boardwalk.

A permit under Part 7 of the FM Act is required if any works are likely to harm any marine vegetation such as mangroves, saltmarsh and seagrass.

4.4.4 Protection of the Environment Operations Act 1997 (PoEO Act)

Under this Act, should an activity involve the pollution of waters or have the potential to pollute waters, defined under the Act as any chemical, biological, physical change to existing water quality (i.e. turbidity, release of untreated wastewater) an Environment Protection Licence should be sought from the NSW Office of Environment and Heritage. In addition the Act relates to any pollution of the environment through noise, air and waste.

The Act also obliges the Contractor undertaking the works and the Council to notify OEH when a "pollution incident" occurs that causes or threatens "material harm" to the environment.

4.4.5 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in section 6 and Appendix F of this REF.

4.4.6 Water Management Act 2000 (WM Act)

Under the WM Act a controlled activity approval is required from the NSW Office of Water for certain types of developments and activities that are carried out in or near a river, lake or estuary. Under the WM Act a controlled activity means:

> *(a) The erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or*
>
> *(b) The removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or*
>
> *(c) The deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or*
>
> *(d) The carrying out of any other activity that affects the quantity or flow of water in a water source.*

This approval must be sought prior to the commencement of works; however, public authorities including local councils are exempt from the requirements to obtain a controlled activity approval under Clause 39A of the Water Management (General) Regulation 2004. It should be noted that NSW Maritime has the power to require the organisation responsible for the works to implement remedial actions if the works have caused, or are likely to cause harm to 'protected land' or 'protected waters'.

4.4.7 Heritage Act 1977

The NSW *Heritage Act 1977* is a statutory tool designed to conserve the cultural heritage of NSW and used to regulate development impacts on the state's heritage assets. Administered by the NSW Heritage Office, the Act details the statutory requirements for protecting historic buildings and places and includes *any place, building, work, relic, movable object, which may be of historic, scientific, cultural, social, archaeological, natural or aesthetic value.*

Impacts to heritage have been assessed in section 6.

4.5 CONFIRMATION OF STATUTORY POSITION

City of Ryde is proposing to assess the development under Part 4 of the EP&A Act. The proposed development would require consent from the City of Ryde and RMS (Maritime division). A development application to City of Ryde and RMS (Maritime division) would be required. Concurrence from DPI (Fisheries) as part of the DA to RMS (Maritime division) for proposed reclamation works would also be required.

5 CONSULTATION

5.1 COMMUNITY CONSULTATION

The City of Ryde has been implementing the River Walk Master Plan since 2007. The masterplan was developed to increase the recreational activities in the LGA and took into account feedback from the local and wider community.

Council carried out community consultation in the latter part of 2011 in an effort to collect, tabulate and consider any issues, ideas and thoughts the community had concerning:

- The location of the path
- The types of materials used to build the path
- Any surveying and boundary issues
- Any effects on security
- Any need to install lighting
- Which sections of the Riverwalk are suitable to cycling
- Which sections of the Riverwalk are suitable for walking
- How the path would impact upon the existing mangroves

Community feedback was used in the development of the preferred concept design.

5.2 CONSULTATION WITH ABORIGINAL COMMUNITY

An Aboriginal and European Archaeological Heritage Impact Statement has been prepared for the Ryde Riverwalk through Bill Mitchell Park, Glades Bay Park and Looking Glass Bay Park (Dominic Steele Consulting Archaeology 2012). No heritage constraints have been identified for the proposed improvements in Looking Glass Bay. The Heritage Impact Statement would be reviewed by the Metropolitan Aboriginal Land Council prior to any works starting.

5.3 GOVERNMENT AGENCY AND STAKEHOLDER INVOLVEMENT

Roads and Maritime Services (Maritime Division) is the consent authority for proposed developments below the mean high water mark. A development application, accompanied by this SEE, would need to be prepared for the section of boardwalk below the mean high water mark in Looking Glass Bay.

As approval from Roads and Maritime Services (Maritime Division) would be required for the proposed works below the mean high water mark, DPI (Fisheries) would need to be notified of the proposal in accordance with section 199 of the Fisheries Management Act for proposed dredging and reclamation works.

Consultation with Sydney Water Corporation would need to be undertaken due to the proximity of the proposed boardwalk to a sewerage pump out facility.

5.4 ONGOING OR FUTURE CONSULTATION

The following consultation would be undertaken:

- This SEE and the concept design would be provided to relevant stakeholders including the general public for comments for a two month period. Feedback received would be used to revise the concept design and the SEE.
- A development application (DA) would be prepared using the revised SEE and concept design. The DA would be exhibited in accordance with the council's procedures for notification of development applications as outlined in Part 2.1 of the DCP.

Should the DA be approved, the local community would be notified of proposed construction works through appropriate notification process including but not limited to advertisements, letter box drops and appropriate signage.

6 ENVIRONMENTAL ASSESSMENT

6.1 SOILS AND WATER QUALITY

6.1.1 Existing environment

Soil type and topography

Looking Glass Bay park slopes down to the bay from north to south. The park is situated in a north-south running gully with a creek cutting the park in eastern and western halves.

Geotechnical investigations have been undertaken for the proposed works at various locations of the park (Figure 6-1). Results are summarised in Table 6-1.

Table 6-1 Results of geotechnical investigations from JK Geotechnics (2012). Refer to Figure 6-1 for borehole locations.

Borehole	Description
14	Silty Clayey sand at least up to 1.3 metres deep.
16	Fill composed of silty sandy clay up to 0.8 metres deep. Fill composed of silty sand from 0.8 to 1.1 metres (auger refusal at 1.1 metres).
17	Fill composed of silty sand up to 0.5 metres deep (auger refusal at 0.5 metres).
19	Fill composed of silty sand up to 0.4 metres deep. Fill composed of silty clay from 0.4 to 1.7 metres deep) Sandstone from 1.7 metres to 1.8 metres (refusal at 1.8 metres).
20	Fill composed of silty sand up to 0.4 metres deep. Fill composed of clayey sand from 0.4 metres to 0.8 metres. Sandstone from 0.8 metres to 1.2 metres (refusal at 1.2 metres).
21	Fill composed of silty sand up to 0.6 metres deep. Sandy clay from 0.6 metres to 0.8 metres. Sandstone from 0.8 metres to 1.3 metres (refusal at 1.3 metres).
22	Fill composed of silty sand up to 0.3 metres deep. Fill composed of clayey sand from 0.3 metres to 0.8 metres. Clayey sand from 0.8 metres to 1 metre. Sandstone from 1 metre to 2.2 metres (refusal at 2.2 metres).
23	Fill composed of silty gravelly sand up to 0.8 metres deep. Sandstone from 0.8 metre to 0.9 metres (refusal at 0.9 metres).

Figure 6-1. Location of boreholes for geotechnical investigations (JK Geotechnics 2012).

Acid Sulphate Soils (ASS)

There is a high probability of occurrence of ASS within Looking Glass Bay and the south west of the Park (Figure 6-2). Results from soil testing undertaken at the site determined the risk of generating ASS conditions following disturbance of the fill/natural soils at the site is considered to be high (EIS 2012).

Figure 6-2. Probability of occurrence of Acid Sulphate soils. Red – High probability; Yellow – Low probability (ASRIS 2012).

Contamination

EIS (2012) provides a report on the contamination of Looking Glass Bay. Results are summarised below.

Looking Glass Bay Park was generally occupied by bushland and dense vegetation since at least 1930. The south-east and east sections of Looking Glass Bay Park were cleared between 1972 and 1980. The site has generally remained unchanged since at least 1980. There are no EPA notices for the site.

EIS (2012) analysed the soils for various contaminants and the resulting values were assessed against National Environmental Protection Measure (1999) and the Site Auditor Guidelines (2006) to determine the potential risk to the environment and/or health. Results indicated the following:

- Heavy metal concentrations were below the site assessment criteria. Some samples had elevated concentrations of zinc above the phytotoxicity criteria levels.
- Total petroleum hydrocarbons and monocyclic aromatic hydrocarbons were below the site assessment criteria.
- The majority of the samples were below site assessment criteria for polycyclic aromatic hydrocarbons and Benzo(a)pyrene except at borehole 17 (refer to Figure 6-1) where the concentrations were above the criteria.
- Organochlorine pesticides and organophosphorus pesticides were below the site assessment criteria.
- Polychlorinated biphenyls were below the site assessment criteria.
- Chrysotile Asbestos was encountered in fill sample borehole 17 embedded in several small fragments of fibre cement. However, respirable fibres were not encountered in any of the samples analysed for this investigation.

The data indicates that the contamination is confined to the top soil profile.

Water Quality

Looking Glass Bay is part of the Parramatta River estuary. A creek runs from north to south through the park and discharges into the bay. Existing water quality data was compiled for physical, chemical and biological water quality parameters. In general it was found that the water quality within the estuary was poor with only limited areas of the Parramatta River Estuary considered suitable for secondary contact. Human activities have resulted in elevated levels of nutrients and gross pollutants entering the estuary. Sediment contamination due to urbanisation and industrialisation of the catchment has also had an impact on water quality within the estuary. Extensive alteration of the estuarine foreshore has limited tidal flushing in some areas, further reducing the water quality.

Looking Glass Bay, like many areas along built up areas of Parramatta River, is impacted by stormwater runoff from the urbanised catchment. Stormwater outlets are located along the foreshore of the bay south west of the park. A gross pollutant trap is also located within the park near Ashburn Place (Figure 6-3).

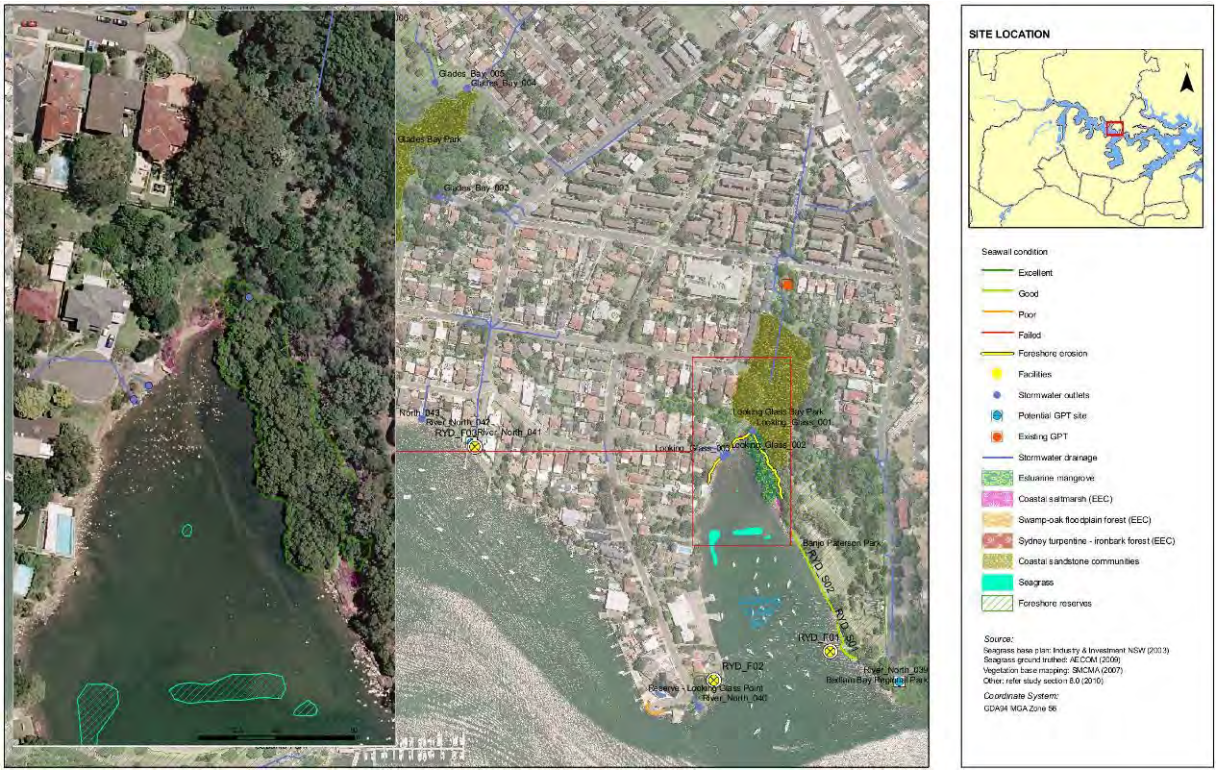


Figure 6-3 Location of stormwater outlets, gross pollutant traps and other environmental aspects at Looking Glass Bay (Aecom 2010).

Looking Glass Bay Park includes a bio-retention basin at the bottom of Amiens Street. The basin reduces stormwater pollutants from the Amiens Street catchment from entering Looking Glass Bay (City of Ryde 2010).

6.1.2 Potential impacts

The proposed works would include some minor earthworks which have the potential to create erosion and subsequent sedimentation of waterways including the creek, Looking Glass Bay and the bio-retention basin.

Piling would be required in the south western section of the park between Bernard Avenue and Amiens Street, including within the intertidal zone for the raised boardwalk over water. Piles for this boardwalk would be driven which would minimise potential disturbance of ASS. The material from the hollow driven piles would be removed from site and disposed of appropriately.

Potential accidental chemical spills may result from the use of construction plant (hydrocarbon spills) as well as during certain activities such as concreting. Concreting of the piles for the boardwalk over water would occur within hollow cylindrical pipes which would act as a bund minimising potential water quality impacts. Concreting would also be required for the paths and boardwalk over land which has the potential to impact land and water if a spill occurs, particularly during clean up of equipment.

Disturbance of soils may disturb potential contaminants including asbestos and polycyclic aromatic hydrocarbons. This has the potential to impact the environment and the general public. Health risks are discussed in section 5.10 and management of waste is discussed in section 5.11.

As groundwater seepage was not encountered during drilling, the risk of contamination impacting the groundwater is relatively low.

6.1.3 Safeguards and mitigation measures

- An Erosion and Sedimentation Control Plan (ESCP) would be prepared as part of the Construction Environmental Management Plan (CEMP) for the proposal prior to the commencement of construction. The ESCP would incorporate specifications outlined in the NSW Soils and Construction – Managing Urban Stormwater Volume 1 “the Blue Book” (Landcom, 2004). Controls would need to avoid any potential impacts to Looking Glass Bay and the creek.
- The CEMP including the ESCP would be reviewed by Council prior to implementation.
- Environmental Work Method Statements (EWMS) would be prepared for high risk activities such as the boardwalk over water. The EWMS would include:
    - Description of works/activities including machinery
    - Outline of the sequence of the works/activities.
    - Identification of environmental impacts due to works/activities.
    - An environmental risk assessment to determine potential risks to discrete work elements or activities likely to affect the environment or residents.
    - A map indicating the locations of sensitive areas.
    - Evaluation of methods to reduce environmental risks.
    - Mitigation measures to reduce environmental risks.
    - A process for assessing the performance of the implemented mitigation measures.
    - A process for resolving environmental issues and conflicts.
    - Emergency procedures for chemical spills and other potential emergency incidents.
- The EWMS would be forwarded by the Project Manager to the Council’s environmental officer for review and approval prior to commencement of works.
- A procedure would be prepared to manage ASS in accordance with the ASS Manual (Stone et al 1998) prior to construction.
- An incident emergency spill plan would be developed and incorporated into the CEMP. The plan would include measures to avoid spillages of fuels, chemicals, and fluids onto any surfaces or into Looking Glass Bay or the creek and an emergency response plan. An emergency spill kit would be kept onsite at all times.

- In the event of an incident the OEH would be notified of any incidents resulting in environmental harm as per Part 5.7 of the *Protection of the Environment Operations Act 1997*.
- All staff would be inducted into the incident emergency spill procedures and made aware of the location of emergency spill kits.
- Should a spill occur during construction, the incident emergency spill plan would be implemented, and Council's Environmental Officer would be contacted.
- All fuels, chemicals, and liquids would be stored at least 40 metres away from any waterways or drainage lines and would be stored in an impervious bunded area within the compound site. Where chemicals, and liquids need to be stored on the barge these would be stored in an impervious bund. The volume of the bunded area would be at least 110% of the volume of the largest tank or 25% of the stored product, if small containers are used (whichever volume is greater).
- The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas off site.
- Any material transported onto pavement surfaces would be swept and removed at the end of each working day.
- Access to waterways using barges/boats or similar is to be via an existing boat ramp with no disturbance to the bank or surrounding vegetation.

6.2 HYDROLOGY

6.2.1 Existing environment

The park is in a gully which slopes down in a southerly direction and includes a small creek which flows into Looking Glass Bay.

A bio retention basin is at the end of Amiens Street, at the bottom of a steep hill. The mulched slope helps to direct overland flow of water into the basin. During heavy rainfall, excess water is able to pond in the basin and slowly filter through the sandy soil. The native vegetation planted in the basin also assists in filtering the water and absorbing nutrients.

The proposal site near Bernard Avenue includes an intertidal estuarine zone which becomes a mudflat at low tide.

6.2.2 Potential impacts

The proposed works would formalise existing dirt paths within the park. This has the potential to increase to a small degree flow of runoff, especially in steeper sections of the paths near Ashburn Place and Amiens Street.

A boardwalk is proposed near Bernard Avenue to link this road with the park. The limited size of the boardwalk and piling would minimise any potential hydrological impacts. The detailed design would need to consider sea level rise scenarios to ensure adequate height is provided in relation to life time of proposed boardwalk.

Potential impacts to overland flow at Amiens Street may result in flows being directed away from the basin.

The bridge over the creek would not include any pilings within the waterway.

6.2.3 Safeguards and mitigation measures

- Sea level rise would be considered in the detailed design of the boardwalk in accordance with the NSW Coastal Planning Guideline: Adapting to sea level rise (DoP 2010).
- Design of paths would ensure increased runoff does not cause downstream erosion or alter the hydrology of the site.
- Detailed design would ensure stormwater runoff from the Amiens Street catchment is still captured by the detention basin.
- Construction works near Amiens Street would be undertaken in such a way that stormwater flows would be directed towards the basin.

6.3 BIODIVERSITY

6.3.1 Existing environment

The following provides a description of the biodiversity within Looking Glass Bay Park using available literature, database searches and site surveys undertaken in December 2011 by **ngh**environmental ecologists. A list of species recorded within Looking Glass Bay is provided in Appendix D.

Vegetation

Looking Glass Bay Park is a 2.1 hectare remnant of bushland on the Parramatta River foreshore. The park is in a gully with a creek running north to south. The vegetation has been described as a coastal sandstone gully forest (Biosphere Environmental consultants 2008, Godden Mackay Logan 2009). The vegetation is dense in the centre of the park while the perimeter of the park is mostly grassed and contains isolated planted trees.

Estuarine Grey Mangroves (protected under the FM Act) and around 150 square metres of coastal saltmarsh in the NSW Sydney Basin Bioregion (an endangered ecological community under the TSC Act) are located along the foreshore of Looking Glass Bay. The saltmarsh in proximity to Bernard Avenue includes the following species:

- *Sporobolus virginicus*
- *Juncus kraussii*
- *Zoysia macrantha*
- *Tetragonia tetragonoides*

The threatened saltmarsh species *Wilsonia backhousei*, while previously recorded along the south eastern foreshore of Looking Glass Bay Park (Biosphere Environmental consultants 2008), was not recorded in the saltmarsh area near Bernard Avenue.

The saltmarsh at Bernard Avenue is currently impacted due to trampling from pedestrian traffic, litter and weed incursions.

The seagrass *Zostera sp* (less than 10 per cent cover) was also observed in the intertidal zone near Bernard Avenue. Seagrass is protected under the FM Act. Figure 6-4 maps the vegetation within Looking Glass Bay Park.

Threatened flora species and communities

A search of the NSW Bionet Atlas undertaken on 28 October 2012 for the Ryde LGA revealed 52 threatened species and 19 threatened communities previously recorded within the LGA (Appendix C). There were no records within two kilometres of the park.

A search of the EPBC protected matters search tool undertaken on 28 October 2012 for a search radius of one kilometre around the proposal site revealed 8 threatened species with the potential to occur (Appendix C).

No threatened flora species were recorded or previously recorded within Looking Glass Bay Park except for *Wilsonia backhousei* which is not located in proximity to the proposed works.

Figure 6-4 Vegetation communities and other ecological constraints

Fauna

The park provides various habitat types which reflect the various vegetation types described and mapped above:

- Grassed areas around the periphery of the park with some large planted trees.
- Dense vegetation in the centre of the park including ground cover, a mid-storey and upper storey (coastal sandstone gully forest).
- Aquatic habitat is present and includes:
    - A small rocky creek with dense riparian vegetation on both banks running through the park. The creek is impacted by the surrounding urban development and stormwater runoff.
    - Intertidal estuarine habitat composed of a mudflat with seagrass, mangroves and saltmarsh. The low seagrass cover would only provide minimal habitat for estuarine fauna species such as macroinvertebrates.

Although the park is located in a highly developed urban setting it does provide some fauna habitat, especially foraging habitat and would serve as a movement corridor. Biosphere Environmental consultants 2008 undertook a series of fauna surveys within Looking Glass Bay Park in April, September and November 2008 that included hair tube analysis, searches for animal tracks, burrows, diggings, feathers, scats, spot lighting, anabat analysis, call playbacks, visual surveys and fish netting. Their surveys recorded 34 species including one common frog species, three reptiles, 24 bird species and 6 mammal species. Only one threatened fauna species was recorded, the grey-headed flying fox. Six species were introduced species. No fish were recorded within the creek. Refer to Appendix D for a species list.

Threatened fauna species

A search of the NSW Bionet Atlas undertaken on 28 October 2012 for the Ryde LGA revealed 66 threatened species previously recorded within the LGA (Appendix C). The only threatened species previously recorded within the park was the grey-headed flying fox.

A search of the EPBC protected matters search tool undertaken on 28 October 2012 for a search radius of one kilometre around the proposal site revealed 24 threatened species with the potential to occur (Appendix C).

The only terrestrial threatened species previously recorded within the park was the grey-headed flying fox.

No threatened aquatic species are likely to use the proposal site due to location in a disturbed intertidal area and lack of habitat.

6.3.2 Potential impacts

The proposal would not require the removal of any large trees or other vegetation. Some trimming of trees, in particular for the raised boardwalk section between Amiens Street and Bernard Avenue may be required to improve access. This would only have a minor impact on vegetation.

The planting of trees and native undergrowth near Amiens Street and Ashburn Place would provide some minor additional habitat.

The proposed concrete/sandstone paths would be within the root zone of some of the larger trees within the park. Impacts to the long term survival of the trees are, however, unlikely considering the limited width of the paths and limited earthworks required. The small piles required for the raised boardwalk section of the path are also unlikely to have major impacts to the root zone of any tree.

The use of small and manoeuvrable construction plant within the park would minimise potential risks of directly impacting trees through accidental collisions.

The intertidal area near Bernard Avenue contains some sensitive communities and/or species including mangroves, seagrass and saltmarsh. These are protected under the FM Act and the coastal saltmarsh is also listed as a threatened ecological community under the TSC Act. Construction activities would be required in this area to construct the raised boardwalk. Activities will require the use of a barge as well as small construction plant such as All Terrain Vehicles (ATVs). Workers would also need to access the area. Movement of people and machinery has the potential to directly impact flora and fauna and its habitat. Considering the location of the mangroves relative to the proposed boardwalk (around ten metres away), no impacts to these should occur. The seagrass should also be able to be avoided considering it is not within the footprint of the proposed boardwalk and around five metres away. Saltmarsh has the highest potential for direct impacts during construction considering the proposed raised boardwalk would span this community and access through the saltmarsh during construction would be required.

Once completed the proposed boardwalk is likely to improve the condition of the saltmarsh as it will span this community and minimise any potential trampling due to current unrestricted pedestrian access. The raised boardwalk is also unlikely to impact tidal inundation of the saltmarsh. Considering the threatened listing for this community under the TSC a 7 part test assessment of significance has been undertaken (Appendix E). The results indicate that impacts are unlikely to be significant taking into account the safeguards outlined in section 6.3.3. No other threatened species are likely to be impacted by the proposed works.

Impacts to flora and fauna as a result of erosion and sedimentation and other water quality impacts may also arise. The highest potential for this to occur is along the foreshore and intertidal area near Bernard Avenue. These potential impacts have been discussed in section 6.2.

6.3.3 Safeguards and mitigation measures

- Construction workers would be made aware of the sensitive nature of the environment prior to construction, in particular the importance to avoid and/or minimise impacts to mangroves, seagrass and saltmarsh.
- The Construction Environmental Management Plan (CEMP) prepared for the works would include a map showing the location of the ecological constraints on site. No go-zones would be clearly indicated on maps and would include the mangroves, seagrass and the dense bushland area at the centre of the park (coastal sandstone gully forest).
- Existing disturbed areas within the saltmarsh area should be used to access the site in order to avoid any further disturbance to this ecological community. To this end an ecologist would peg zones within the saltmarsh area to identify these as no go zones for construction workers.
- The design of the paths would ensure that there would be no impacts to the root zone of any trees such that their long term health and stability would be compromised.
- No excavation that would alter the flow/tides within the intertidal zones would be allowed.

- No mangroves would be removed as part of the works.
- The barge would avoid and not anchor within the seagrass area.
- There would be no piling within the seagrass area.
- The proposed boardwalk over water should avoid any piling within the saltmarsh (i.e a single span across the whole saltmarsh area is preferred).
- Educational signage on estuarine habitats (saltmarsh, mangroves, seagrass) should be provided.
- No trees would be removed as part of the proposed works and only minor trimming would be allowed to allow access during construction and operation.
- A permit under Part 7 of the Fisheries Management Act would be required for potential harm to marine vegetation.
- Approval from Roads and Maritime Services (Maritime Division) would be required for works below the mean high tide mark. As such a permit under the FM Act for dredging and reclamation would not be required and instead DPI (Fisheries) would be notified of proposed dredging and reclamation works in accordance with clause 199 of the FM Act.
- Weed management along the foreshore of Looking Glass Bay should be undertaken to improve the saltmarsh habitat.

6.4 NOISE AND VIBRATION

6.4.1 Policies

The Interim Construction Noise Guideline (ICNG) (DECCW 2009) provides guidance on assessing construction noise impacts. In accordance with the ICNG, a quantitative noise assessment is required when construction activities would impact sensitive noise receivers for more than three weeks. While the duration of the proposed is not known at this stage, and is likely to be undertaken in stages, each stage is likely to be over three weeks.

6.4.2 Existing environment

Looking Glass Bay Park is surrounded by residential properties which border the park (Figure 6-5). Background noise readings (RBL) were undertaken on 27 September 2012 at the boundary of a sensitive receiver (Figure 6-5). The RBL during day time was 39.7 dB(A) ($LA90_{(15min)}$). Noise sources in the area include local road traffic which would be low.

Figure 6-5 Sensitive noise receivers surrounding Looking Glass Bay Park. Red: residential; Blue: Aged Care; Green: Looking Glass Bay park – passive recreation. Star indicates location of background noise monitoring (Source Google Earth)

In accordance with the ICNG, the construction noise management levels ($LAeq_{(15min)}$) would be:

- Residential properties: 49.7 dB(A)
- Passive recreation area: 60 dB(A)
- Aged care: 49.7 dB(A)

Where construction noise levels are above these levels, sensitive receivers would be considered noise impacted (or highly noise impacted if construction noise is higher than 75dBA).

Sensitive receivers to vibration include nearby residences but also Sydney Water infrastructure such as the sewer pump station at Bernard Avenue.

6.4.3 Potential impacts

Table 6-2 provides an assessment of the various construction plant that would be used and the noise they would generate at the nearest sensitive receiver (within 10 metres) to the proposed works. The results provide an indication of the potential construction noise impacts and show that surrounding residents are likely to be noise affected or highly noise affected during construction.

Table 6-2 Construction plant noise assessment. The noise assessment only takes into account distance of sensitive noise receiver from noise source without taking into account any potential noise barriers present .

Construction plant	Noise at source (Sound Power Level Leq dB(A))	Noise at 10 metres (closest sensitive receiver) (Leq dB(A))
Light vehicles (4 wheel drive)	103	75
Trucks	108	80
Piling rig (driven)	115	87
Bobcat T250 loader	101	73
Bobcat E35 excavator	101	73
Argo 6x6 Frontier 580 vehicle (All Terrain Vehicle)	95	67
Small concrete truck	109	81
Powered hand tools	109	81

It should be noted that:

- Construction activities would be temporary.
- Construction activities would be undertaken during day time, therefore there would be no sleep disturbance.
- A single receiver would not be impacted for the full duration of the construction period as the works would move away from a single receiver as the works progress.
- The piling rig, the loudest construction plant, would only be used near Bernard Avenue for the boardwalk over water and would only be used for a short duration.

Management measures have been recommended in section 6.4.4 to minimise potential construction noise impacts.

Vibration impacts on nearby residences and in particular Sydney Water infrastructure have the potential to occur during pile driving for the proposed boardwalk over water. The short section of boardwalk over water would minimise the number of piles required to be driven which would minimise potential impacts. The use of rollers and/or wacker packers may also create vibrations.

When dealing with construction vibration, the effects on buildings can be divided into three main categories:

- Those in which the occupants or users of the building are inconvenienced or possibly disturbed.
- Those where the building contents may be affected.
- Those in which the integrity of the building or the structure itself may be prejudiced.

Human Comfort

OEH's '*Assessing Vibration; a technical guideline*', published in February 2006 provides criteria for vibration sources which are continuous, impulsive or intermittent. Preferred and maximum values for continuous and impulsive vibration are defined in the guideline. The piling works and rollers and/or wacker packers are not anticipated to have any adverse impact on human comfort.

Structural Damage to Buildings

There is currently no Australian Standard for assessment of building damage caused by vibrational energy. However, according to related international standards, the minimum 'safe limit' of vibration at low frequencies for commercial and industrial buildings is 20mm/s. For dwellings it is 5mm/s and for particularly sensitive structures (eg historical with preservation orders etc), it is 3mm/s. Pile driving can have vibration impacts of 1 to 3mm/second at distances of 25 to 50m depending on soil conditions. These levels are below the threshold of any possibility of damage to structures the area.

Operational noise impacts are not anticipated as a result of the proposed works.

6.4.4 Safeguards and mitigation measures

- Works would only be carried out during standard working hours (i.e 7am–6pm Monday to Friday, 8am–1pm Saturdays).
- Measures would be developed in accordance with the interim construction noise guidelines (DECCW 2009) and form part of the CEMP to manage potential construction noise once final construction methodology is known.
- Regular updates on the proposal would be provided to the community.
- A community liaison phone number and site contact would be provided so that noise and or vibration-related complaints if any can be received and addressed in a timely manner.
- Once final construction methodologies are known, vibration emission levels from each plant, in particular the piling rig, rollers and wacker packers, would be assessed prior to the commencement of construction works and the potential impacts of vibration on nearby residences and infrastructure would be determined. Safe buffer distances and other feasible measures (choice of plant) would be determined to avoid structural damage to sensitive receivers.

6.5 AIR QUALITY

6.5.1 Existing environment

Residential properties are located around the perimeter of the park and within 20 metres of proposed works (Figure 6-5).

6.5.2 Potential impacts

Impacts to air quality may occur due to exhaust fumes from construction plant and vehicles. Minor earthworks would also be required which may cause dust, especially during windy conditions.

6.5.3 Safeguards and mitigation measures

- Plant and machinery would be maintained in accordance with manufacturer's specification.
- Smoky emissions will be kept within the standards and regulations under the Protection of the Environment Operations Act 1997 (PoEO Act) that no vehicle shall have continuous smoky emissions for more than 10 seconds.

- Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.
- Stockpiles or areas that may generate dust are to be managed to suppress dust emissions.
- Vegetation or other materials are not to be burnt on site.
- Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.

6.6 NON-ABORIGINAL HERITAGE

6.6.1 Existing environment

A search of the NSW Heritage Office database and Australian heritage database was undertaken on 24 October 2012. Banjo Paterson Park is listed on the Ryde council LEP as a local heritage item (Appendix C). No other items are located within proximity of the proposal (Dominic Steele Consulting Archaeology 2012). In addition, no specific areas of potential Non-Aboriginal archaeological sensitivity have been identified in the areas that are proposed to formalise current informal pedestrian tracks in Looking Glass Bay to connect with the established shared paths in Banjo Paterson Park.

6.6.2 Potential impacts

The proposed works would formalise existing dirt paths within Looking Glass Bay. No listed heritage items or items with potential heritage value were identified within the park.

The formalised path would link with existing paths within Banjo Paterson Park. No vegetation removal would be required as part of these works and impacts to the heritage value of this park are unlikely.

Dominic Steele Consulting Archaeology (2012) has assessed that potential impacts of the proposal on Non-Aboriginal heritage are unlikely.

6.6.3 Safeguards and mitigation measures

- If unexpected archaeological remains or relics are uncovered during the works, all works must cease in the vicinity of the material/find and the council environmental manager must be contacted immediately.
- No vegetation removal would be undertaken within Banjo Paterson Park.
- Workers would be made aware of the heritage value of Banjo Paterson Park prior to construction.

6.7 ABORIGINAL HERITAGE

6.7.1 Existing environment

A number of Aboriginal heritage sites occur around the edges of Looking Glass Bay. No specific areas of potential Aboriginal archaeological sensitivity have been identified in the areas that are proposed to formalise current informal pedestrian tracks in Looking Glass Bay to connect with the established shared paths in Banjo Paterson Park (Dominic Steele Consulting Archaeology 2012).

6.7.2 Potential impacts

Dominic Steele Consulting Archaeology (2012) has assessed the potential impacts of the proposal on Aboriginal Heritage within Looking Glass Bay Park. None of the sites would be affected by the proposal due to the distance from the proposed works.

6.7.3 Safeguards and mitigation measures

- If unexpected Aboriginal items are uncovered during the works, all works must cease in the vicinity of the material/find and the council environmental manager must be contacted immediately.
- The specialist Aboriginal heritage impact statement (Dominic Steele Consulting Archaeology 2012) would be provided to the Metropolitan Aboriginal Land Council for comment.

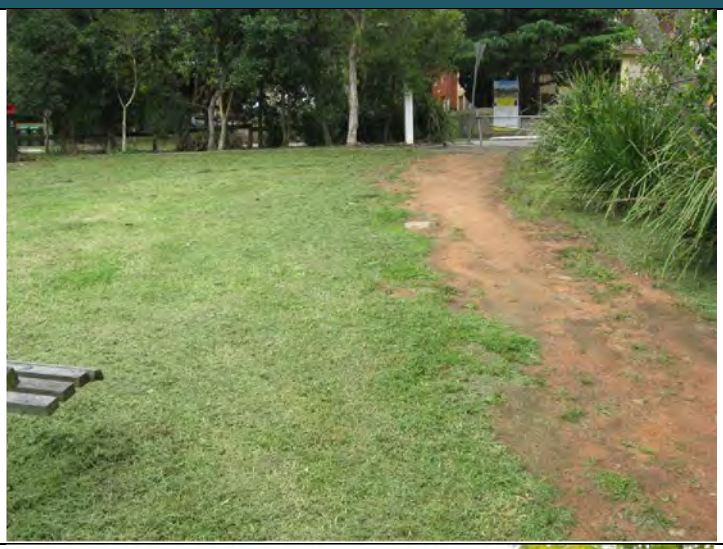
6.8 VISUAL AMENITY

6.8.1 Existing environment

The proposal would be undertaken within Looking Glass Bay Park. The park offers a high visual amenity to users and is visible from properties bordering the park (though fences may interrupt direct views to the park), boat users located within Looking Glass Bay and recreational users of the park. Dense vegetation within the park means that the whole park cannot be viewed from any one location. Table 6-3 provides site photographs from key view points within the park and visual receivers.

Table 6-3 Key viewpoints

Key View point	Visual receivers	Site photograph
Within the park	Park users	

Key View point	Visual receivers	Site photograph
Entrance from Ashburn Place	Park users, pedestrians, road users, adjacent residents	
Entrance from Amiens Street	Park users, pedestrians, road users, adjacent residents	
Entrance from Bernard Avenue	Park users, pedestrians, road users, adjacent residents, water users	

Key View point	Visual receivers	Site photograph
		

6.8.2 Potential impacts

The impact of the proposal on each viewpoint has been assessed and has been based on a composite of the sensitivity of the view and magnitude of the proposal in that view (see Figure 6-6 for grading values).

	Magnitude						
Sensitivity		High	High to moderate	Moderate	Moderate to Low	Low	Negligible
	High	High Impact	High Impact	Moderate-High	Moderate-High	Moderate	Negligible
	High to moderate	High Impact	Moderate-High	Moderate-High	Moderate	Moderate	Negligible
	Moderate	Moderate-High	Moderate-High	Moderate	Moderate	Moderate-Low	Negligible
	Moderate to Low	Moderate-High	Moderate	Moderate	Moderate-Low	Moderate-Low	Negligible
	Low	Moderate	Moderate	Moderate-Low	Moderate-Low	Low Impact	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Figure 6-6 Grading values for visual impact assessment.

Visual sensitivity refers to the quality of the view and how sensitive it is to the proposed change. Visual sensitivity is related to the direction of view and the composition of the view. Magnitude refers to the nature of the proposal and its proximity to the viewer. Table 6-4 provides an assessment of the visual impacts of the proposal.

Table 6-4 Visual impact assessment

Viewpoint	Impact of proposal	Visual sensitivity	Magnitude	Overall impact	Comment
Within the park	New concrete and sandstone paths, park benches and vegetation.	High to Moderate	Moderate to Low	Moderate	Informal paths already occur within the park. The proposal would involve upgrading some of these paths using landscaped concrete and sandstone. The urban setting of the park minimise any potential visual impacts.
Entrance from Ashburn Place	New concrete and sandstone paths, park benches and vegetation.	Moderate to low	Moderate to Low	Moderate to Low	This area already contains park facilities
Entrance from Amiens Street	New concrete and sandstone paths and stairs, park benches and vegetation.	Moderate to low	Moderate to Low	Moderate to Low	The additional landscaping with trees at this entrance may minimise potential visual impacts of stairs and paths.
Entrance from Bernard Avenue	New boardwalk, park benches and vegetation.	Moderate to low	Moderate to Low	Moderate to Low	Sensitive receivers are already impacted through the presence of Sydney Water infrastructure which would minimise the potential visual impact of an additional man made structure such as the proposed boardwalk.

The overall visual impact of the proposal is likely to be Moderate to Low. The design uses materials commonly used in the Sydney region for landscaping of urban parks. The use of landscaping and planting of trees at Amiens Street and Ashburn Place entrances would improve the visual amenity for local residents and users by providing some visual barrier to the proposed paths and stairs.

Appendix B includes a concept plan with artist interpretations of some sections of the proposal.

6.8.3 Safeguards and mitigation measures

- Detailed design would consider the use of materials that minimises potential visual impacts (e.g. no use of bright colours).

6.9 TRAFFIC AND ACCESS

6.9.1 Existing environment

Unformalised access tracks (compacted soil and gravel) are located along the edges of the park in the grassed areas. There is a small one span wooden bridge crossing the creek in the northern section of the park.

The park can be accessed via Banjo Paterson Park to the east and local streets Ashburn Place to the north, Amiens Streets to the west and Bernard Avenue to the south west (though this last access is not formalised and access to the park traverses the intertidal zone). Maintenance vehicles are able to access Looking Glass Bay Park east of the creek via a gate at Banjo Paterson Park.

A public car park is located along which allows access to Banjo Paterson Park and Looking Glass Bay Park. Parking is also available along local roads.

The access from Amiens Street is located at its dead end where there are two driveway accesses to private properties. Access from this location is down a steep grassed embankment.

Bernard Avenue is a dead end.

6.9.2 Potential impacts

Construction

Construction plant and machinery would use local roads to access relevant sections of the paths. Roadside parking would be used during this time. It is not anticipated that this would have a major impact on parking during the construction period due to the limited number of vehicles likely to be required.

A piling rig would be required at Bernard Avenue in order to construct the boardwalk. This is unlikely to impact waterway traffic as the piling would be undertaken within the intertidal zone and there are no boat ramps at this location. However, Sydney Water infrastructure including man holes are located in this area and the piling may temporarily impede access if not adequately managed.

Access to sections of the park may be temporarily impeded during the construction period. It is unlikely that the whole park would be closed for any period of time during construction.

Operation

The proposed paths and boardwalk would improve access to Looking Glass Bay Park for all users, especially at Amiens Street and Bernard Avenue. Access would be greatly improved for disabled users through the provision of formalised paths. However, certain access points would remain inaccessible for certain users such as wheelchair users due to the requirements for stairs. These would be located at between Amiens Street and Bernard Avenue where access for such users is currently not possible.

6.9.3 Safeguards and mitigation measures

- Access to Sydney Water infrastructure would be maintained at all times during construction. If this is not possible, Sydney Water would be consulted for any works that may impede access.
- Design of the boardwalk over water would need to ensure Sydney Water infrastructure remains accessible at all times.
- Driveway accesses would not be impeded at any time during construction.
- The park would remain accessible to the public throughout the construction period.
- Loading of the barge with construction plant and material including piling rig would be undertaken from existing boat ramps in the area.

6.10 SOCIO-ECONOMIC IMPACTS

6.10.1 Potential impacts

The proposed works would impact the local community through:

- Visual impacts (Section 6.5)
- Construction noise (Section 6.4)
- Traffic and access (Section 6.6)

A number of underground utilities including man holes and the Sydney Water sewer pump station, including underground pipes, are located in close proximity to the works. The minor excavation is unlikely to impact any of these utilities and none will require to be relocated. However, potential impacts to the Sydney Water sewer pump station, in particular any underground pipes, may occur during piling for the proposed boardwalk.

Contaminants including asbestos and PAHs have been found in certain soil samples (section 6.1). EIS (2012) has assessed the risk to human health from the proposed works. Direct contact with contaminated soil can lead to dermal absorption or accidental ingestion. The risk is highest during construction as soils are disturbed from excavation. Construction workers would be more at risk compared to the general public as the general public would not be able to access the construction site. Once the path has been constructed, exposure to the underlying fill would be avoided. While asbestos was encountered, respirable asbestos fibres were not encountered and therefore the risk of inhalation is low.

The proposal would improve the park amenities and access for various users, including cyclists and the disabled. It is not anticipated that these improved amenities would have a significant impact on the number of people that would use the park as no new facilities that have the potential to attract new users from the wider locality or region would be constructed.

The proposed path would be designed and constructed to minimise any maintenance which would reduce costs over time.

6.10.2 Safeguards and mitigation measures

- Local residents would be advised of the proposed works at least two weeks prior to construction commencing through a letter box drop.

- Appropriate signage would be placed at the entrances to the park to advise users of proposed works prior to start of construction.
- Dial before you dig would be undertaken to determine locations of all underground utilities prior to detailed design and construction. The design and construction of the proposed river walk should avoid impacts to utilities. Particular attention should be taken during the piling of the boardwalk so that the Sydney Water sewer pump station and associated infrastructure (i.e. underground pipes) are not impacted.
- An asbestos management plan would be prepared prior to construction as part of the CEMP.
- A walkover inspection and 'emu pick' along the length of the walkway by an experienced asbestos consultant would be undertaken prior to construction to remove any visible asbestos cement fragments.

6.11 WASTE AND RESOURCE MANAGEMENT

6.11.1 Policy setting

Waste management would be undertaken in accordance with the Waste Avoidance and Resource Recovery Act 2001.

The objectives of this Act are:

(a) to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development,

(b) to ensure that resource management options are considered against a hierarchy of the following order:

i) avoidance of unnecessary resource consumption,

ii) resource recovery (including reuse, reprocessing, recycling and energy recovery),

iii) disposal,

(c) to provide for the continual reduction in waste generation,

(d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste,

(e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste,

(f) to ensure the efficient funding of waste and resource management planning, programs and service delivery,

(g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis,

(h) to assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997.

Part 7.2 of the Ryde City Council DCP also provides further guidance to waste minimisation and management.

6.11.2 Potential impacts

Waste would be created through vegetation removal (mostly trimming), excavations and construction material.

The fill material is generally classed as General Solid Waste (non-putrescible) (GSW) containing asbestos, GSW containing treated ASS and GSW. The natural material containing ASS (in low lying areas) is classed as GSW containing treated ASS and the sandstone bedrock is classed as Virgin Excavated Natural Material (VENM) (EIS 2012).

6.11.3 Safeguards and mitigation measures

- A Site Waste Minimisation and Management Plan (SWMMP) would be prepared in accordance with Part 7.2 of the Ryde City Council Development Control Plan 2008. The plan would take into consideration the results and recommendations of EIS (2012).
- The use of recycled material in construction should be considered.
- Resource management hierarchy principles are to be followed:
  -Avoid unnecessary resource consumption as a priority.
  -Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery).
  -Disposal is undertaken as a last resort
  (in accordance with the Waste Avoidance & Resource Recovery Act 2001)
- Waste is not to be burnt on site.
- Waste material is not to be left on site once the works have been completed.
- Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working shift.

6.12 CUMULATIVE IMPACTS

Cumulative environmental impacts result from the combined effect of individual impacts associated with the proposal in addition to the impacts of other activities in the area.

6.12.1 Potential impacts

The proposed works would contribute to the overall Ryde River Walk Master Plan and is one of the last four sections of the walk to be implemented. It would create a regional route along the Parramatta foreshore and link existing parks, reserves and public spaces by a regional system of recreational trails (refer to section 2.1).

7 SUMMARY OF SAFEGUARDS

7.1 ENVIRONMENTAL MANAGEMENT PLANS

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Contractors Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. These plans will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The plans will be prepared prior to construction of the proposal and must be reviewed and certified by Council prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements.

7.2 SUMMARY OF SAFEGUARDS AND MANAGEMENT MEASURES

Table 7-1 Key Environmental Safeguards.

Issues	Key Environmental Objectives

Soil and Water	• An Erosion and Sedimentation Control Plan (ESCP) would be prepared as part of the Construction Environmental Management Plan (CEMP) for the proposal prior to the commencement of construction. The ESCP would incorporate specifications outlined in the NSW Soils and Construction – Managing Urban Stormwater Volume 1 "the Blue Book" (Landcom, 2004). Controls would need to avoid any potential impacts to Looking Glass Bay and the creek.
	• The CEMP including the ESCP would be reviewed by Council prior to implementation.
	• Environmental Work Method Statements (EWMS) would be prepared for high risk activities such as the boardwalk over water. The EWMS would include:
	  ○ Description of works/activities including machinery
	  ○ Outline of the sequence of the works/activities.
	  ○ Identification of environmental impacts due to works/activities.
	  ○ An environmental risk assessment to determine potential risks to discrete work elements or activities likely to affect the environment or residents.
	  ○ A map indicating the locations of sensitive areas.
	  ○ Evaluation of methods to reduce environmental risks.
	  ○ Mitigation measures to reduce environmental risks.
	  ○ A process for assessing the performance of the implemented mitigation measures.

Issues	Key Environmental Objectives
	○ A process for resolving environmental issues and conflicts. ○ Emergency procedures for chemical spills and other potential emergency incidents. • The EWMS would be forwarded by the Project Manager to the Council's environmental officer for review and approval prior to commencement of works. • A procedure would be prepared to manage ASS in accordance with the ASS Manual (Stone et al 1998) prior to construction. • An incident emergency spill plan would be developed and incorporated into the CEMP. The plan would include measures to avoid spillages of fuels, chemicals, and fluids onto any surfaces or into Looking Glass Bay or the creek and an emergency response plan. An emergency spill kit would be kept onsite at all times. • In the event of an incident the OEH would be notified of any incidents resulting in environmental harm as per Part 5.7 of the *Protection of the Environment Operations Act 1997*. • All staff would be inducted into the incident emergency spill procedures and made aware of the location of emergency spill kits. • Should a spill occur during construction, the incident emergency spill plan would be implemented, and Council's Environmental Officer would be contacted. • All fuels, chemicals, and liquids would be stored at least 40 metres away from any waterways or drainage lines and would be stored in an impervious bunded area within the compound site. Where chemicals, and liquids need to be stored on the barge these would be stored in an impervious bund. The volume of the bunded area would be at least 110% of the volume of the largest tank or 25% of the stored product, if small containers are used (whichever volume is greater). • The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas off site. • Any material transported onto pavement surfaces would be swept and removed at the end of each working day. • Access to waterways using barges/boats or similar is to be via an existing boat ramp with no disturbance to the bank or surrounding vegetation.
Hydrology	• Sea level rise would be considered in the detailed design of the boardwalk in accordance with the NSW Coastal Planning Guideline: Adapting to sea level rise (DoP 2010). • Design of paths would ensure increased runoff does not cause downstream erosion or alter the hydrology of the site. • Detailed design would ensure stormwater runoff from the Amiens Street catchment is still captured by the detention basin. • Construction works near Amiens Street would be undertaken in

Issues	Key Environmental Objectives
	such a way that stormwater flows would be directed towards the basin.
Biodiversity	• Construction workers would be made aware of the sensitive nature of the environment prior to construction, in particular the importance to avoid and/or minimise impacts to mangroves, seagrass and saltmarsh. • The Construction Environmental Management Plan (CEMP) prepared for the works would include a map showing the location of the ecological constraints on site. No go-zones would be clearly indicated on maps and would include the mangroves, seagrass and the dense bushland area at the centre of the park (coastal sandstone gully forest). • Existing disturbed areas within the saltmarsh area should be used to access the site in order to avoid any further disturbance to this ecological community. To this end an ecologist would peg zones within the saltmarsh area to identify these as no go zones for construction workers. • The design of the paths would ensure that there would be no impacts to the root zone of any trees such that their long term health and stability would be compromised. • No excavation that would alter the flow/tides within the intertidal zones would be allowed. • No mangroves would be removed as part of the works. • The barge would avoid and not anchor within the seagrass area. • There would be no piling within the seagrass area. • The proposed boardwalk over water should avoid any piling within the saltmarsh (i.e a single span across the whole saltmarsh area is preferred). • Educational signage on estuarine habitats (saltmarsh, mangroves, seagrass) should be provided. • No trees would be removed as part of the proposed works and only minor trimming would be allowed to allow access during construction and operation. • A permit under Part 7 of the Fisheries Management Act would be required for potential harm to marine vegetation. • Approval from Roads and Maritime Services (Maritime Division) would be required for works below the mean high tide mark. As such a permit under the FM Act for dredging and reclamation would not be required and instead DPI (Fisheries) would be notified of proposed dredging and reclamation works in accordance with clause 199 of the

Issues	Key Environmental Objectives
	FM Act. • Weed management along the foreshore of Looking Glass Bay should be undertaken to improve the saltmarsh habitat.
Noise and vibration	• Works would only be carried out during standard working hours (i.e 7am–6pm Monday to Friday, 8am–1pm Saturdays). • Measures would be developed in accordance with the interim construction noise guidelines (DECCW 2009) and form part of the CEMP to manage potential construction noise once final construction methodology is known. • Regular updates on the proposal would be provided to the community. • A community liaison phone number and site contact would be provided so that noise and or vibration-related complaints if any can be received and addressed in a timely manner. • Once final construction methodologies are known, vibration emission levels from each plant, in particular the piling rig, rollers and wacker packers, would be assessed prior to the commencement of construction works and the potential impacts of vibration on nearby residences and infrastructure would be determined. Safe buffer distances and other feasible measures (choice of plant) would be determined to avoid structural damage to sensitive receivers.
Air quality	• Plant and machinery would be maintained in accordance with manufacturer's specification. • Smoky emissions will be kept within the standards and regulations under the Protection of the Environment Operations Act 1997 (PoEO Act) that no vehicle shall have continuous smoky emissions for more than 10 seconds.
Non-Aboriginal heritage	• If unexpected archaeological remains or relics are uncovered during the works, all works must cease in the vicinity of the material/find and the council environmental manager must be contacted immediately. • No vegetation removal would be undertaken within Banjo Paterson Park. • Workers would be made aware of the heritage value of Banjo Paterson Park prior to construction.
Aboriginal heritage	• If unexpected Aboriginal items are uncovered during the works, all works must cease in the vicinity of the material/find and the council environmental manager must be contacted immediately. • The specialist Aboriginal heritage impact statement (Dominic

Issues	Key Environmental Objectives
	Steele Consulting Archaeology 2012) would be provided to the Metropolitan Aboriginal Land Council for comment.
Visual amenity	• Detailed design would consider the use of materials that minimises potential visual impacts (e.g. no use of bright colours).
Traffic and access	• Access to Sydney Water infrastructure would be maintained at all times during construction. If this is not possible, Sydney Water would be consulted for any works that may impede access. • Design of the boardwalk over water would need to ensure Sydney Water infrastructure remains accessible at all times. • Driveway accesses would not be impeded at any time during construction. • The park would remain accessible to the public throughout the construction period. • Loading of the barge with construction plant and material including piling rig would be undertaken from existing boat ramps in the area.
Socio-economic	• Local residents would be advised of the proposed works at least two weeks prior to construction commencing through a letter box drop. • Appropriate signage would be placed at the entrances to the park to advise users of proposed works prior to start of construction. • Dial before you dig would be undertaken to determine locations of all underground utilities prior to detailed design and construction. The design and construction of the proposed river walk should avoid impacts to utilities. Particular attention should be taken during the piling of the boardwalk so that the Sydney Water sewer pump station and associated infrastructure (i.e. underground pipes) are not impacted. • An asbestos management plan would be prepared prior to construction as part of the CEMP. • A walkover inspection and 'emu pick' along the length of the walkway by an experienced asbestos consultant would be undertaken prior to construction to remove any visible asbestos cement fragments.
Waste and resource management	• A Site Waste Minimisation and Management Plan (SWMMP) would be prepared in accordance with Part 7.2 of the Ryde City Council Development Control Plan 2008. The plan would take into consideration the results and recommendations of EIS (2012). • The use of recycled material in construction should be considered.

Issues	Key Environmental Objectives
	• Resource management hierarchy principles are to be followed: -Avoid unnecessary resource consumption as a priority. -Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery). -Disposal is undertaken as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001) • Waste is not to be burnt on site. • Waste material is not to be left on site once the works have been completed. • Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working shift.

7.3 LICENSES, PERMITS AND APPROVALS

Table 7-2 Summary of Licenses and Approvals Required

Legal Instrument	License or Approval
Fisheries Management Act 1994	• A permit under Part 7 of the FM Act is required if any dredging or reclamation works are to be undertaken unless these works are approved by another relevant public authority (other than a council) in which case the Minister for Primary Industries needs to be notified in accordance with Section 199 of the Fisheries Management Act 1994. Consent from RMS (Maritime division) would be required for reclamation works (boardwalk below mean high water mark).
Fisheries Management Act 1994	• A permit under Part 7 of the FM is required if any works are likely to harm any marine vegetation such as mangroves, saltmarsh and seagrass.

8 CONCLUSION

8.1 PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

8.1.1 The precautionary principle

Namely that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. This statement of environmental effects has been prepared utilising the precautionary principle. That is, if threats are perceived as possibly leading to serious or irreversible environmental damage, then either the non-development of the proposal would occur, or the development modified to ensure that such threats do not exist. This has been the approach in relation to recommendations itemised in Section 6.

8.1.2 Inter-generational equity

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The proposed works would not impact on natural features to a level that would compromise the health, diversity or productivity of the environment to a level that would impact on future generations. Proposed works would improve access to the park for a various users.

8.1.3 Conservation of biological diversity and ecological integrity

The proposed works would not compromise the biological diversity and ecological integrity of Looking Glass Bay Park. No vegetation removal would be required. The proposed boardwalk would improve the protection of the threatened coastal saltmarsh present on the foreshore of the bay near Bernard Avenue.

8.1.4 Appropriate valuation of environmental factors

The proposed design has taken into consideration maintenance of the structures to minimise costs over the lifetime of the development.

8.2 COMPLIANCE WITH MATTERS LISTED IN CLAUSE 79C(1) OF THE EP&A ACT

In determining a development application, a consent authority is to take into consideration the matters listed in clause 79C(1) of the EP&A Act. The following table lists the matters and the compliance of the proposal.

Table 8-1 Clause 79C(1) of the EP&A Act matters

Clause 79C(1) matter	Response
Take into consideration the provisions of any environmental planning	Refer to Section 3

Clause 79C(1) matter	Response
instrument.	
Take into consideration the provisions of any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Director-General has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	No proposed instrument that is or has been the subject of public consultation under this Act applies to the proposal.
Take into consideration the provisions of any development control plan.	Refer to Table 3-1
Take into consideration the provisions of any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F.	There are no planning agreements under section 93F pertaining to the proposal.
Take into consideration the provisions of the regulations (to the extent that they prescribe matters for the purposes of this paragraph).	This SEE has been prepared to comply with the EP&A Act and Regulations.
Take into consideration the provisions of any coastal zone management plan (within the meaning of the *Coastal Protection Act 1979*)	A draft Parramatta River Estuary Coastal Zone Management Plan (CZMP) is currently being prepared. No coastal zone management plan currently applies to the proposal.
Take into consideration the likely impacts of that development, including environmental impacts on both the natural and built	Refer to Section 5

Clause 79C(1) matter	Response
environments, and social and economic impacts in the locality,	
Take into consideration the suitability of the site for the development.	The proposal would formalise existing paths through an existing council park.
Take into consideration any submissions made in accordance with this Act or the regulations.	Consultation has been undertaken as part of this proposal as described in Section 4. This SEE and concept design would be provided to the public for comment. Any submissions would be considered in finalising any designs.
Take into consideration the public interest.	Consultation has been undertaken as part of this proposal as described in Section 4 and the current concept design has incorporated feedback from the public. This SEE and concept design would be provided to the public for comment.

8.3 CONCLUSION

The proposed path and boardwalk at Looking Glass Bay park is subject to assessment under Part 4 of the EP&A Act and has taken into account the matters listed in clause 79C(1) of the Act.

The proposal as described in the SEE best meets the project objectives but would still result in some temporary construction impacts, mostly due to construction noise. Mitigation measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also improve access to Looking Glass Bay Park for all users, including users with disabilities, through formalised paths and access points. On balance the proposal is considered justified.

The environmental impacts of the proposal are not likely to be significant and therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought for the proposal from the Minister for Planning. The proposal is unlikely to affect threatened species, populations or ecological communities or their habitats, within the meaning of the Threatened Species Conservation Act 1995 or Fisheries Management Act 1994 and therefore a Species Impact Statement is not required. The proposal is also unlikely to affect Commonwealth land or have an impact on any matters of national environmental significance.

9 CERTIFICATION

This SEE provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.

Company: **ngh**environmental

Name: Raphael Morgan

Position: Manager, Sydney region

Date: 22/11/2012

10 REFERENCES

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Appendices

APPENDIX A SITE PHOTOGRAPHS

Photo 1. View of entrance to Looking Glass Bay Park from Banjo Paterson Park.

Photo 2. Looking Glass Bay Park east of the creek.

Photo 3. Path leading to Ashburn Place.

Photo 4. Bridge over creek line running north to south.

Photo 5. Looking Glass Bay Park looking north from the bottom of Amiens Street.

Photo 6. Looking Glass Bay Park looking up to Amiens Street.

Photo 7. Looking Glass Bay Park looking south from the bottom of Amiens Street.

Photo 8. View of Looking Glass Bay with mangroves to the left.

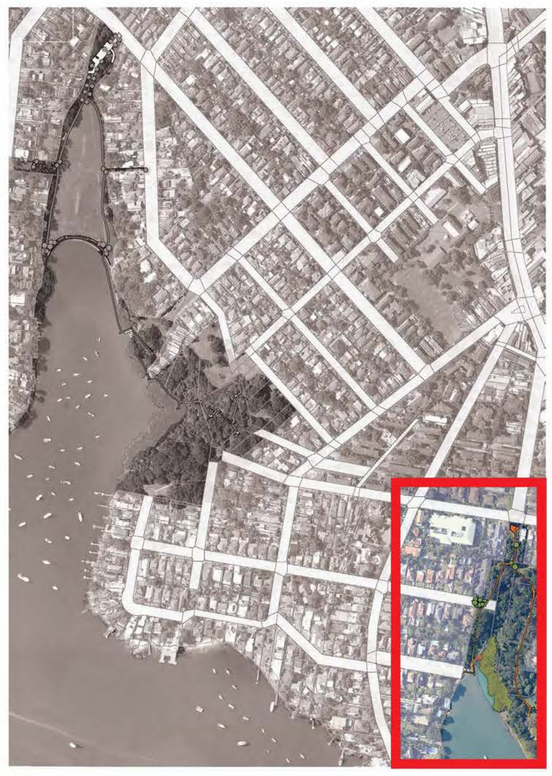
Photo 9. Intertidal area of Looking Glass Bay near Bernard Avenue with saltmarsh community.

Photo 10. View of Bernard Avenue and Sydney Water infrastructure.

APPENDIX B CONCEPT DESIGN

Landscape Plan | **Looking Glass Bay**

Landscape Plan | **Context**



Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

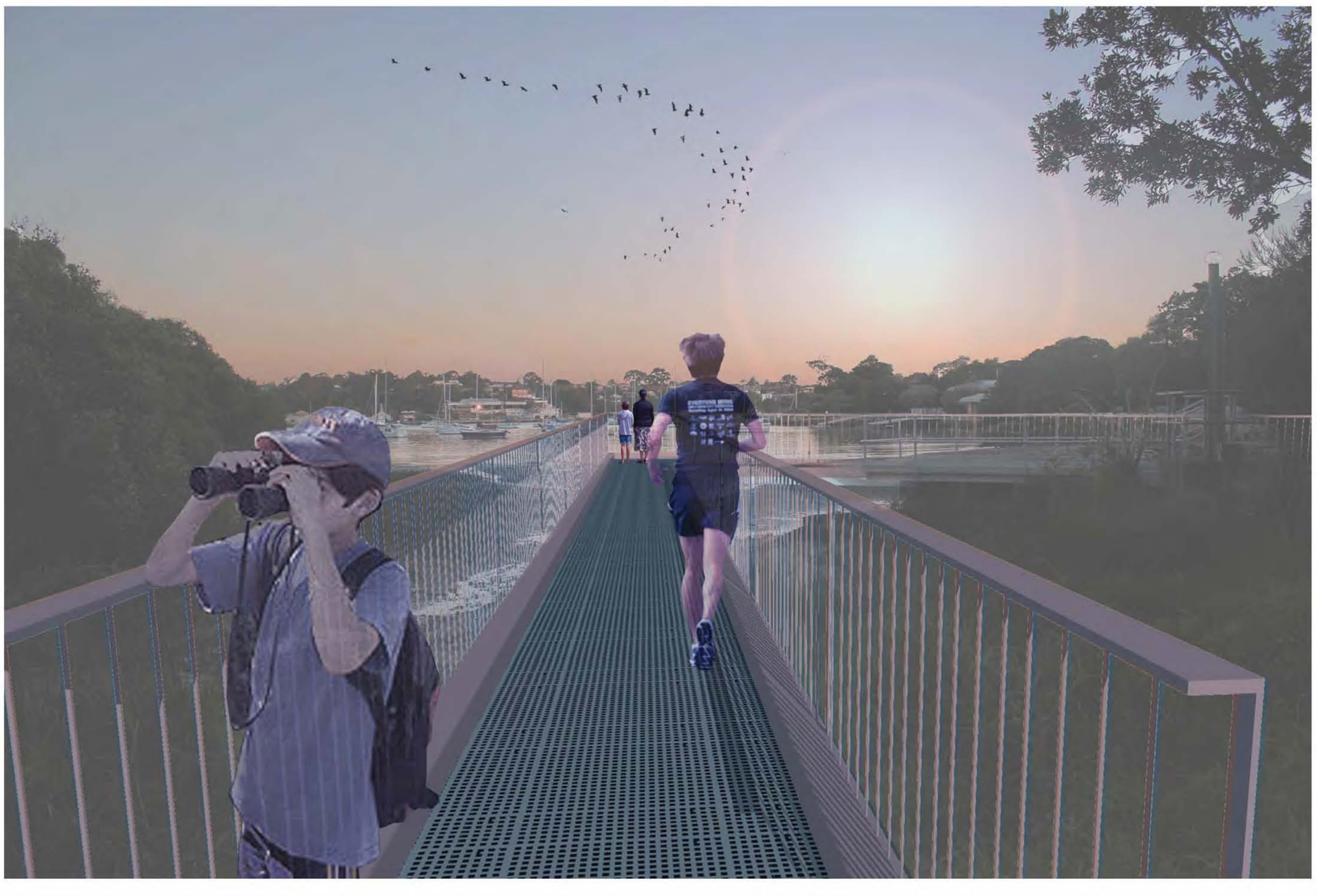
1. Sydney water sewer pump station
2. Existing salt marsh to be protected.
3. 1.5m wide fiberglass mesh boardwalk with balustrade and lean rail.
4. New entry; concrete unit path with sandstone steps. New tree planting; Angophora costata and Glochidion ferdinandii in native grass understory.
5. Rest area with integrated seating and signage
6. New entry; upgraded lawn and edging, new seats, and existing sandstone flagging entry. New tree planting; Angophora costata and Glochidion ferdinandii in native grass understory.
7. New concrete footpath; 1.5m wide, with decorative sawcuts
8. New crushed stabilised sandstone seating areas and path with integrated seating
9. Connect to existing path in Banjo Patterson Park

Landscape Sections & Perspectives | **Looking Glass Bay**

Detailed Plan 07| **Scale 1:200**

Section 04 | **Scale 1:100**

Section 05 | **Scale 1:100**



Perspective 03 | **Looking Glass Bay looking South**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: **1:500 @ A1**

0 10 20 30 40m

Landscape Master Plan | Development Application

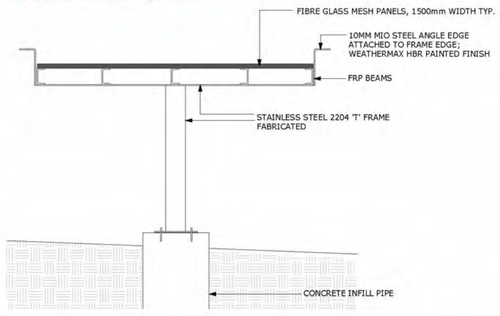
Dwg no. : **11050-L007**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Materials Palette**

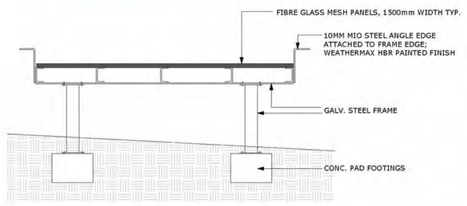
SURFACES & STAIRS

Ground Surface Type 1:
Fibreglass Mesh
- 1.5m wide generally
- 1.8m wide with balustrades
- Used for sections over water or undulating land

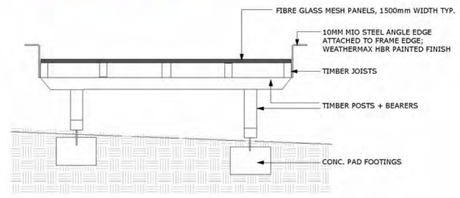
G1.1: Over water



G1.2: On Land

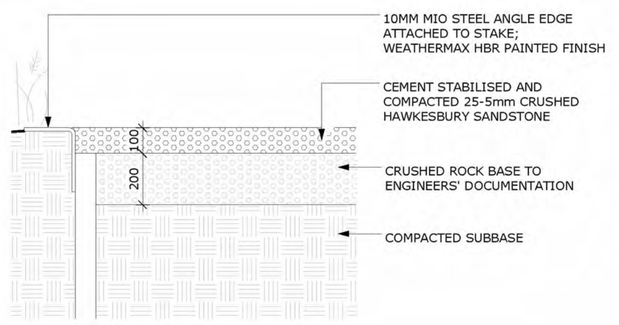


G1.3: On Land



Ground Surface Type 2:
Insitu Concrete Paving
- 1.5m wide
- Decorative diagonal sawcuts at 800mm cts
- Used for on-grade paths where grades exceed 1:20

Ground Surface Type 3:
Crushed Stabilised Sandstone
- 1.5m wide
- Used at entries, rest areas and to water's edge of Bill Mitchell Park



Ground Surface Type 4:
Sandstone Flagging
- Mortar jointed and laid on concrete base
- Used at entries and path junctions

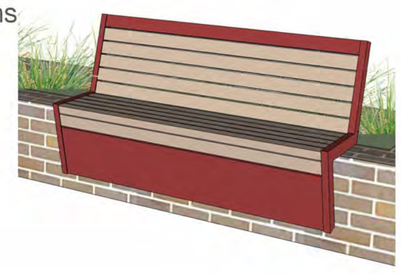
Stairs Type 1:
Sandstone block steps
- 2.6m wide
- Used at entries and within bushland areas

WALLS & SEATS

Walls Type 1:
Brick Wall
- Double course brick wall
- Mass concrete footing
- Used at Bill Mitchell Park water's edge

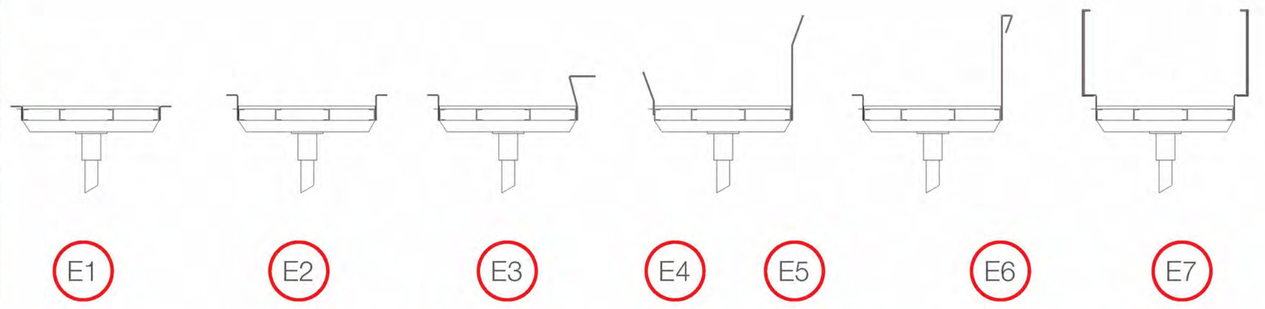
Bench Seat type 1:
Folded steel edge
- With or without backrest
- MIO 10mm folded steel plate
- Installed at edge of boardwalk and rest stops

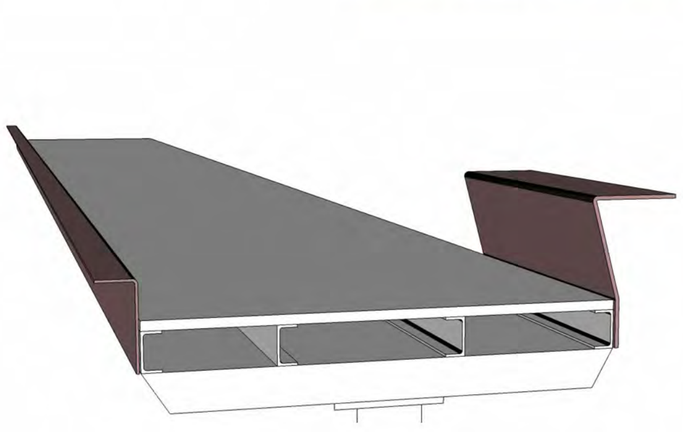
Bench Seat type 2:
Folded steel with composite battens
- MIO 10mm folded steel frame
- Composite plastic battens
- Attached to wall at Bill Mitchell Park
- Free standing seats at rest stops

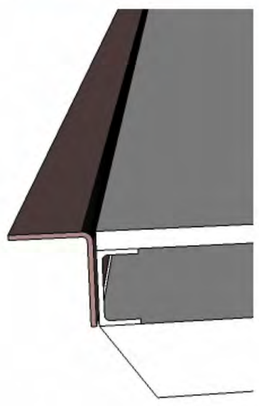


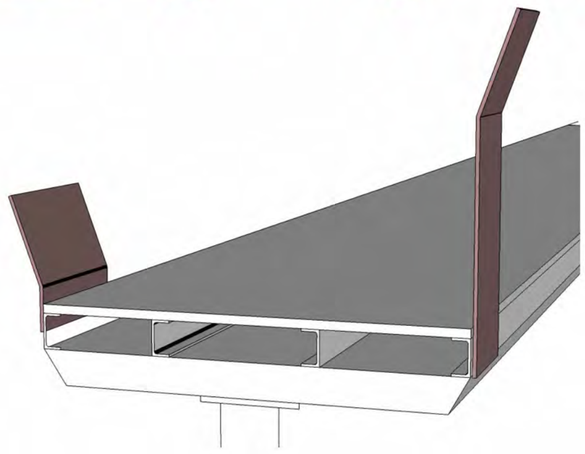
EDGES

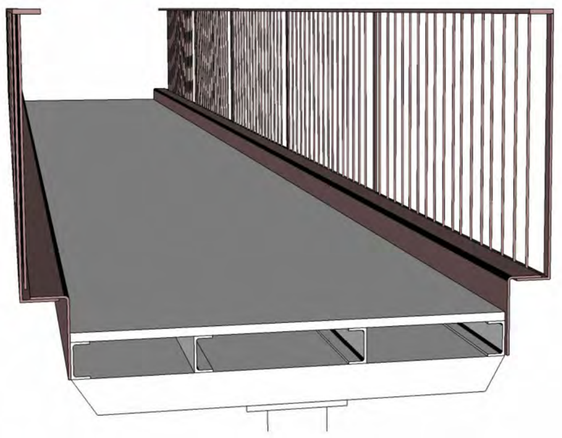
Folded Steel Edge Treatments:
1. Flush Edge
2. Kickrail
3. Perch Seat
4. Signage Plinth
5. Directional Signage
6. Lean Rail
7. Balustrade





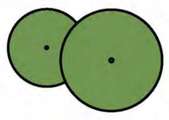






PLANTING

Tree Type 1:
Native Evergreen Tree



Species:
- Eucalytpus botrioydes
- Glochidion ferdinandi
- Angophora costata

Mass Planting Type 1:
Native Understorey Grasses and Groundcovers (0.5m max height)

Species:
- Lomandra longifolia
- Dianella carulea
- dianella prunina
- Isolepis nodosa
- bursaria spinosa
- dodonaea triquetra
- lomandra filiformis
- hardenbergia violacea
- juncus usitatus
- kennedia rubicunda
- banksia serrata
- olearia microphylla
- wahlenbergia ssp.
- hakea dactyloides

APPENDIX C DATABASE SEARCHES

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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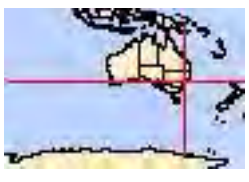
This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	32
Listed Migratory Species:	35

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	37
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	35
State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	15
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Mixophyes balbus		
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
Mixophyes iteratus		
Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Isoodon obesulus obesulus		
Southern Brown Bandicoot (Eastern) [68050]	Endangered	Species or species habitat may occur within area
Petrogale penicillata		
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae		
New Holland Mouse [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Caladenia tessellata		
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Melaleuca biconvexa		
Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area
Pelargonium sp. Striatellum (G.W.Carr 10345)		
Omeo Stork's-bill [84065]	Endangered	Species or species habitat may occur within area
Pimelea curviflora var. curviflora		
[4182]	Vulnerable	Species or species habitat may occur within area
Pimelea spicata		
[20834]	Endangered	Species or species habitat may occur within area
Streblus pendulinus		
Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area
Tetratheca glandulosa		
Glandular Pink-bell [2350]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Marine Species		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Xanthomyza phrygia Regent Honeyeater [430]	Endangered*	Species or species habitat likely to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species

Name	Threatened	Type of Presence
		habitat known to occur within area
[Limosa limosa](#) Black-tailed Godwit [845]		Species or species habitat known to occur within area
[Numenius madagascariensis](#) Eastern Curlew [847]		Species or species habitat known to occur within area
[Numenius phaeopus](#) Whimbrel [849]		Species or species habitat known to occur within area
[Pluvialis fulva](#) Pacific Golden Plover [25545]		Species or species habitat known to occur within area
[Rostratula benghalensis (sensu lato)](#) Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Australian Postal Commission

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
[Ardea alba](#) Great Egret, White Egret [59541]		Species or species habitat may occur within area
[Ardea ibis](#) Cattle Egret [59542]		Species or species habitat may occur within area
[Arenaria interpres](#) Ruddy Turnstone [872]		Species or species habitat known to occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
[Calidris canutus](#) Red Knot, Knot [855]		Species or species habitat known to occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Numenius madagascariensis Eastern Curlew [847]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Parramatta and Lane Cove Rivers Landscapes	NSW	Indicative Place
Historic		
Avondale	NSW	Indicative Place
Batemans Hut	NSW	Indicative Place
Dunham House	NSW	Indicative Place
Hunters Hill Conservation Area Extension	NSW	Indicative Place
Laureston	NSW	Indicative Place
Ledbury	NSW	Indicative Place
Rockend	NSW	Indicative Place

Name	State	Status
Surrey	NSW	Indicative Place
Clifton	NSW	Registered
Craigends	NSW	Registered
Cypress Grove	NSW	Registered
Doctors Residence	NSW	Registered
Escarpment Terraces	NSW	Registered
Gatekeepers Cottage	NSW	Registered
Gatekeepers Lodge	NSW	Registered
Gladesville Mental Hospital Precinct	NSW	Registered
Group of Service Buildings	NSW	Registered
House	NSW	Registered
House	NSW	Registered
Hunters Hill Conservation Area	NSW	Registered
Industrial Therapy Unit	NSW	Registered
Medical Records Department	NSW	Registered
Medical Superintendents Residence (former)	NSW	Registered
Mendip	NSW	Registered
Nurses Quarters	NSW	Registered
Original (1836-38) Quadrangular Asylum Ranges	NSW	Registered
Pottery Building	NSW	Registered
Provision Store	NSW	Registered
Punt Road Gates	NSW	Registered
Sandstone Walling	NSW	Registered
The Guest House	NSW	Registered
The Priory	NSW	Registered
Wards 17 and 18	NSW	Registered
Workshop	NSW	Registered

State and Territory Reserves [Resource Information]

Name	State
Parramatta River	NSW

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Frogs		
Bufo marinus		
Cane Toad [1772]		Species or species habitat likely to occur within area
Mammals		
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides		
Alligator Weed [11620]		Species or species habitat likely to occur within area
Asparagus asparagoides		
Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

Coordinates

-33.83837 151.12625

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions.
Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded 0.01°).

Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) Entities in RYDE LGA returned a total of 128 records of 170 species.
Report generated on 28/10/2012 8:31 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P
Animalia	Amphibia	Myobatrachidae	3042	*Heleioporus australiacus*		Giant Burrowing Frog	V,P
Animalia	Amphibia	Myobatrachidae	3116	*Pseudophryne australis*		Red-crowned Toadlet	V,P
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P
Animalia	Amphibia	Hylidae	3169	*Litoria brevipalmata*		Green-thighed Frog	V,P
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P
Animalia	Reptilia	Dermochelyidae	2013	*Dermochelys coriacea*		Leatherback Turtle	E1,P
Animalia	Reptilia	Varanidae	2287	*Varanus rosenbergi*		Rosenberg's Goanna	V,P
Animalia	Reptilia	Elapidae	2676	*^Hoplocephalus bungaroides*		Broad-headed Snake	E1,P,2
Animalia	Aves	Anatidae	0200	*Nettapus coromandelianus*		Cotton Pygmy-Goose	E1,P
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*		Black-necked Stork	E1,P
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*		Australasian Bittern	E1,P
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*		Black Bittern	V,P
Animalia	Aves	Accipitridae	0218	*Circus assimilis*		Spotted Harrier	V,P
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*		Little Eagle	V,P
Animalia	Aves	Accipitridae	8739	*Pandion cristatus*		Eastern Osprey	V,P
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*		Bush Stone-curlew	E1,P
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*		Beach Stone-curlew	E4A,P

Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P
Animalia	Aves	Charadriidae	0141	*Charadrius leschenaultii*	Greater Sand-plover	V,P
Animalia	Aves	Charadriidae	0139	*Charadrius mongolus*	Lesser Sand-plover	V,P
Animalia	Aves	Rostratulidae	0170	*Rostratula australis*	Australian Painted Snipe	E1,P
Animalia	Aves	Scolopacidae	0166	*Calidris alba*	Sanderling	V,P
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*	Curlew Sandpiper	E1,P
Animalia	Aves	Scolopacidae	0165	*Calidris tenuirostris*	Great Knot	V,P
Animalia	Aves	Scolopacidae	0167	*Limicola falcinellus*	Broad-billed Sandpiper	V,P
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*	Black-tailed Godwit	V,P
Animalia	Aves	Scolopacidae	0160	*Xenus cinereus*	Terek Sandpiper	V,P
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P
Animalia	Aves	Cacatuidae	0268	*^^Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3
Animalia	Aves	Cacatuidae	0265	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*	Little Lorikeet	V,P
Animalia	Aves	Psittacidae	0309	*^^Lathamus discolor*	Swift Parrot	E1,P,3
Animalia	Aves	Psittacidae	0305	*^^Neophema chrysogaster*	Orange-bellied Parrot	E4A,P,3
Animalia	Aves	Psittacidae	8913	*^^Pezoporus wallicus wallicus*	Eastern Ground Parrot	V,P,3
Animalia	Aves	Strigidae	0246	*^^Ninox connivens*	Barking Owl	V,P,3
Animalia	Aves	Strigidae	0248	*^^Ninox strenua*	Powerful Owl	V,P,3
Animalia	Aves	Tytonidae	0250	*^^Tyto novaehollandiae*	Masked Owl	V,P,3
Animalia	Aves	Climacteridae	8127	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P
Animalia	Aves	Dasyornithidae	0519	*Dasyornis brachypterus*	Eastern Bristlebird	E1,P
Animalia	Aves	Acanthizidae	0504	*Chthonicola sagittata*	Speckled Warbler	V,P

Animalia	Aves	Meliphagidae	0603	*Anthochaera phrygia*	Regent Honeyeater	E4A,P
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P
Animalia	Aves	Meliphagidae	0598	*Grantiella picta*	Painted Honeyeater	V,P
Animalia	Aves	Meliphagidae	8303	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P
Animalia	Aves	Petroicidae	8367	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V,P
Animalia	Aves	Petroicidae	0380	*Petroica boodang*	Scarlet Robin	V,P
Animalia	Aves	Petroicidae	0382	*Petroica phoenicea*	Flame Robin	V,P
Animalia	Aves	Estrildidae	0652	*Stagonopleura guttata*	Diamond Firetail	V,P
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P
Animalia	Mammalia	Peramelidae	1710	*Isoodon obesulus obesulus*	Southern Brown Bandicoot (eastern)	E1,P
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	V,P
Animalia	Mammalia	Burramyidae	1150	*Cercartetus nanus*	Eastern Pygmy-possum	V,P
Animalia	Mammalia	Petauridae	1136	*Petaurus australis*	Yellow-bellied Glider	V,P
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P
Animalia	Mammalia	Molossidae	1329	*Mormopterus norfolkensis*	Eastern Freetail-bat	V,P
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P
Animalia	Mammalia	Vespertilionidae	1346	*Miniopterus australis*	Little Bentwing-bat	V,P
Animalia	Mammalia	Vespertilionidae	1834	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V,P

Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P
Animalia	Gastropoda	Camaenidae	I006	*Meridolum corneovirens*	Cumberland Plain Land Snail	E1
Plantae	Flora	Apocynaceae	1226	*Cynanchum elegans*	White-flowered Wax Plant	E1,P
Plantae	Flora	Campanulaceae	1937	*Wahlenbergia multicaulis*	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2
Plantae	Flora	Casuarinaceae	8321	*^^Allocasuarina portuensis*	Nielsen Park She-oak	E1,P,3
Plantae	Flora	Convolvulaceae	2234	*Wilsonia backhousei*	Narrow-leafed Wilsonia	V,P
Plantae	Flora	Dilleniaceae	11422	*Hibbertia puberula*		E1,P
Plantae	Flora	Dilleniaceae	13902	*Hibbertia sp. Bankstown*		E4A,P
Plantae	Flora	Dilleniaceae	11250	*Hibbertia superans*		E1,P
Plantae	Flora	Elaeocarpaceae	6205	*Tetratheca glandulosa*		V,P
Plantae	Flora	Ericaceae	7752	*Epacris purpurascens var. purpurascens*		V,P
Plantae	Flora	Ericaceae	2618	*Leucopogon exolasius*	Woronora Beard-heath	V,P
Plantae	Flora	Euphorbiaceae	9851	*Chamaesyce psammogeton*	Sand Spurge	E1,P
Plantae	Flora	Fabaceae (Faboideae)	2853	*Dillwynia tenuifolia*		V,P
Plantae	Flora	Fabaceae (Faboideae)	3008	*Pultenaea pedunculata*	Matted Bush-pea	E1,P
Plantae	Flora	Fabaceae (Mimosoideae)	3728	*Acacia bynoeana*	Bynoe's Wattle	E1,P
Plantae	Flora	Fabaceae (Mimosoideae)	3860	*Acacia pubescens*	Downy Wattle	V,P
Plantae	Flora	Fabaceae (Mimosoideae)	9672	*Acacia terminalis subsp. terminalis*	Sunshine Wattle	E1,P

Plantae	Flora	Grammitidaceae	9471	^^*Grammitis stenophylla*	Narrow-leaf Finger Fern	E1,P,3
Plantae	Flora	Gyrostemonaceae	9411	^^*Gyrostemon thesioides*		E1,P,3
Plantae	Flora	Haloragaceae	3257	*Haloragodendron lucasii*		E1,P
Fungi	Flora	Hygrophoraceae	F006	*Camarophyllopsis kearneyi*		E1,P
Fungi	Flora	Hygrophoraceae	F003	*Hygrocybe anomala var. ianthinomarginata*		V,P
Fungi	Flora	Hygrophoraceae	F004	*Hygrocybe aurantipes*		V,P
Fungi	Flora	Hygrophoraceae	F001	*Hygrocybe austropratensis*		E1,P
Fungi	Flora	Hygrophoraceae	F007	*Hygrocybe collucera*		E1,P
Fungi	Flora	Hygrophoraceae	F008	*Hygrocybe griseoramosa*		E1,P
Fungi	Flora	Hygrophoraceae	F005	*Hygrocybe lanecovensis*		E1,P
Fungi	Flora	Hygrophoraceae	F002	*Hygrocybe reesiae*		V,P
Fungi	Flora	Hygrophoraceae	F015	*Hygrocybe rubronivea*		V,P
Plantae	Flora	Juncaginaceae	3363	*Maundia triglochinoides*		V,P
Plantae	Flora	Lamiaceae	3418	*Prostanthera marifolia*	Seaforth Mintbush	E4A,P
Plantae	Flora	Lobeliaceae	1911	^^*Hypsela sessiliflora*		E1,P,3
Plantae	Flora	Myrtaceae	4007	^^*Callistemon linearifolius*	Netted Bottle Brush	V,P,3
Plantae	Flora	Myrtaceae	4024	*Darwinia biflora*		V,P
Plantae	Flora	Myrtaceae	4067	*Eucalyptus camfieldii*	Camfield's Stringybark	V,P
Plantae	Flora	Myrtaceae	4134	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	V,P
Plantae	Flora	Myrtaceae	8314	*Leptospermum deanei*		V,P
Plantae	Flora	Myrtaceae	4248	*Melaleuca deanei*	Deane's Paperbark	V,P
Plantae	Flora	Myrtaceae	4293	*Syzygium paniculatum*	Magenta Lilly Pilly	E1,P
Plantae	Flora	Orchidaceae	4386	^*Caladenia tessellata*	Thick Lip Spider Orchid	E1,P,2
Plantae	Flora	Orchidaceae	4464	^*Genoplesium baueri*	Bauer's Midge Orchid	V,P,2

Plantae	Flora	Orchidaceae	9616	*^Microtis angusii*	Angus's Onion Orchid	E1,P,2
Plantae	Flora	Orchidaceae	4504	*^Prasophyllum fuscum*	Slaty Leek Orchid	E4A,P,2
Plantae	Flora	Orchidaceae	9615	*^Pterostylis saxicola*	Sydney Plains Greenhood	E1,P,2
Plantae	Flora	Orchidaceae	9479	*^Pterostylis sp. Botany Bay*	Botany Bay Bearded Orchid	E1,P,2
Plantae	Flora	Poaceae	4875	*Deyeuxia appressa*		E1,P
Plantae	Flora	Proteaceae	5365	*Grevillea caleyi*	Caley's Grevillea	E1,P
Plantae	Flora	Proteaceae	10009	*Grevillea parviflora subsp. parviflora*	Small-flower Grevillea	V,P
Plantae	Flora	Proteaceae	5458	*Persoonia hirsuta*	Hairy Geebung	E1,P
Plantae	Flora	Proteaceae	5467	*Persoonia nutans*	Nodding Geebung	E1,P
Plantae	Flora	Rhamnaceae	5591	*Pomaderris prunifolia*	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2
Plantae	Flora	Thymelaeaceae	6965	*Pimelea curviflora var. curviflora*		V,P
Plantae	Flora	Thymelaeaceae	6190	*Pimelea spicata*	Spiked Rice-flower	E1,P
Community				*Blue Gum High Forest in the Sydney Basin Bioregion*	Blue Gum High Forest in the Sydney Basin Bioregion	E4B
Community				*Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion*	Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V2
Community				*Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community				*Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion*	Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E3

Community	*Cumberland Plain Woodland in the Sydney Basin Bioregion*	Cumberland Plain Woodland in the Sydney Basin Bioregion	E4B
Community	*Duffys Forest Ecological Community in the Sydney Basin Bioregion*	Duffys Forest Ecological Community in the Sydney Basin Bioregion	E3
Community	*Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion*	Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion	E3
Community	*Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Moist Shale Woodland in the Sydney Basin Bioregion*	Moist Shale Woodland in the Sydney Basin Bioregion	E3
Community	*River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Shale gravel Transition Forest in the Sydney Basin Bioregion*	Shale gravel Transition Forest in the Sydney Basin Bioregion	E3
Community	*Shale/Sandstone Transition Forest*	Shale/Sandstone Transition Forest	E3
Community	*Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion*	Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	E3

Community	*Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Sydney Freshwater Wetlands in the Sydney Basin Bioregion*	Sydney Freshwater Wetlands in the Sydney Basin Bioregion	E3
Community	*Sydney Turpentine-Ironbark Forest*	Sydney Turpentine-Ironbark Forest	E3
Community	*Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions*	Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Western Sydney Dry Rainforest in the Sydney Basin Bioregion*	Western Sydney Dry Rainforest in the Sydney Basin Bioregion	E3
Threat	*Alteration of habitat following subsidence due to longwall mining*	Alteration of habitat following subsidence due to longwall mining	KTP
Threat	*Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands*	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP
Threat	*Anthropogenic Climate Change*	Anthropogenic Climate Change	KTP
Threat	*Bushrock removal*	Bushrock removal	KTP

Threat	*Clearing of native vegetation*	Clearing of native vegetation	KTP
Threat	*Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)*	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	KTP
Threat	*Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758*	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	KTP
Threat	*Competition from feral honey bees, Apis mellifera L.*	Competition from feral honey bees, Apis mellifera L.	KTP
Threat	*Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners*	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP
Threat	*Herbivory and environmental degradation caused by feral deer*	Herbivory and environmental degradation caused by feral deer	KTP
Threat	*High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP
Threat	*Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972*	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	KTP
Threat	*Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations*	Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP

Threat	*Infection of frogs by amphibian chytrid causing the disease chytridiomycosis*	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP
Threat	*Infection of native plants by Phytophthora cinnamomi*	Infection of native plants by Phytophthora cinnamomi	KTP
Threat	*Introduction of the Large Earth Bumblebee Bombus terrestris (L.)*	Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	KTP
Threat	*Invasion and establishment of exotic vines and scramblers*	Invasion and establishment of exotic vines and scramblers	KTP
Threat	*Invasion and establishment of Scotch Broom (Cytisus scoparius)*	Invasion and establishment of Scotch Broom (Cytisus scoparius)	KTP
Threat	*Invasion and establishment of the Cane Toad (Bufo marinus)*	Invasion and establishment of the Cane Toad (Bufo marinus)	KTP
Threat	*Invasion of native plant communities by African Olive Olea europaea L. subsp. cuspidata (Wall ex G. Don Cirferri)*	Invasion of native plant communities by African Olive Olea europaea L. subsp. cuspidata (Wall ex G. Don Cirferri)	KTP
Threat	*Invasion of native plant communities by Chrysanthemoides monilifera*	Invasion of native plant communities by Chrysanthemoides monilifera	KTP
Threat	*Invasion of native plant communities by exotic perennial grasses*	Invasion of native plant communities by exotic perennial grasses	KTP
Threat	*Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW*	Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	KTP

Threat	*Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)*	Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	KTP
Threat	*Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants*	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP
Threat	*Loss of Hollow-bearing Trees*	Loss of Hollow-bearing Trees	KTP
Threat	*Loss or degradation (or both) of sites used for hill-topping by butterflies*	Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP
Threat	*Predation and hybridisation by Feral Dogs, Canis lupus familiaris*	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	KTP
Threat	*Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)*	Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP
Threat	*Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)*	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	KTP
Threat	*Predation by the Feral Cat Felis catus (Linnaeus, 1758)*	Predation by the Feral Cat Felis catus (Linnaeus, 1758)	KTP
Threat	*Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758*	Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	KTP

Threat	*Removal of dead wood and dead trees*	Removal of dead wood and dead trees	KTP

Search for NSW heritage

Return to search page where you can refine/broaden your search. ItemName 0

Statutory listed items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into two sections.

- **Section 1**. contains items listed by the **heritage council** under the NSW Heritage Act. This includes listing on the state heritage register, an interim heritage order or protected under section 136 of the NSW Heritage Act. This information is provided by the Heritage Branch.
- **Section 2**. contains items listed by **local councils & shires and state government agencies**. This section may also contain additional information on some of the items listed in the first section.

Section 1. Items listed under the NSW Heritage Act.

Your search returned 1 record.

Item name	Address	Suburb	LGA	Listed under Heritage Act
Gladesville Drill Hall	144 Ryde Road	Gladesville	Ryde	Yes

ItemName 0

Section 2. Items listed by Local Government and State Agencies.

Your search returned 33 records.

Item name	Address	Suburb	LGA	Information source
Avondale	76 Wharf Road	Gladesville	Ryde	LGOV
Banjo Paterson Park	38 Punt Road	Gladesville	Ryde	LGOV
Christ Church	220 Victoria Road	Gladesville	Ryde	LGOV
Clock	Wharf/Meriton Streets	Gladesville	Ryde	LGOV
Electricity Substation No. 129	38-42 Pitwater Road	Gladesville	Ryde	SGOV
Gates	220 Victoria Road	Gladesville	Ryde	LGOV
Gladesville Public School	172-180 Victoria Road	Gladesville	Ryde	LGOV
Great North Road	Bedlam Point To Eastwood	Ryde, Gladesville, Eastwood	Ryde	LGOV
House	10 Cambridge Street	Gladesville	Ryde	LGOV
House	8 Oates Avenue	Gladesville	Ryde	LGOV
House	10 Pelican Street	Gladesville	Ryde	LGOV
House	55 Wharf Road	Gladesville	Ryde	LGOV
House	19A Amiens Street	Gladesville	Ryde	LGOV
House	1-9 Monash Road	Gladesville	Ryde	LGOV

House	3 Tyrell Street	Gladesville	Ryde	LGOV
House	42 Tyrell Street	Gladesville	Ryde	LGOV
House	37 Wharf Road	Gladesville	Ryde	LGOV
House	310 Victoria Road	Gladesville	Ryde	LGOV
Houses	23-33 Amiens Street	Gladesville	Ryde	LGOV
Houses	43-45 Wharf Road	Gladesville	Ryde	LGOV
Houses	3, 17 & 19 Thompson Street	Gladesville	Ryde	LGOV
Monash Park Obelisk	142 Ryde Road	Gladesville	Ryde	LGOV
Monument, Glades Bay Park	45 Ashburn Place	Gladesville	Ryde	LGOV
Presbyterian Church	265A Victoria Road	Gladesville	Ryde	LGOV
Rock Engraving	Bedlam Point	Gladesville	Ryde	LGOV
Rock Engraving	Glades Bay Native Gardens	Gladesville	Ryde	LGOV
Rockend Cottage	38-40 Punt Road	Gladesville	Ryde	SGOV
Rockend Cottage	1 Punt Road, Bedlam Point	Gladesville	Ryde	LGOV
Substation	38-42 Pittwater Road	Gladesville	Ryde	LGOV
Tavern	170 Victoria Road	Gladesville	Ryde	LGOV
The Drill Hall Building 1	144 Ryde Street	Gladesville	Ryde	LGOV
Towalla	120 Pittwater Road	Gladesville	Ryde	LGOV
Wharf Remains	Bedlam Point	Gladesville	Ryde	LGOV

There was a total of 34 records matching your search criteria.

Key:
LGA = Local Government Area
GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.
Note: The Heritage Branch seeks to keep the State Heritage Inventory (SHI) up to date, however the latest listings in Local and Regional Evironmental Plans (LEPs and REPs) may not yet be included. Always check with the relevant local council or shire for the most recent listings.

Search Results

26 results found.

Addington 813 Victoria Rd	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Avondale 76 Wharf Rd	Gladesville, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Ben Lomond 37 Pennant Av	Denistone, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Bridge over Lane Cove River Ryde Rd	West Pymble, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)
Brush Farm House Lawson St	Eastwood, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cottages Experimental Building Station Epping Rd	North Ryde, NSW, Australia	(Rejected Place) Register of the National Estate (Non-statutory archive)
Eastwood Fire Station 269 Rowe St	Eastwood, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Eastwood House (former) 40 Hillview Rd	Eastwood, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Gladesville Drill Hall (former) 144 Ryde Rd	Gladesville, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Gladesville Drill Hall (former) 144 Ryde Rd	Gladesville, NSW, Australia	(Ineligible Place) Commonwealth Heritage List

Hattons Cottage	158 Blaxland Rd	Ryde, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)
Linton	4 Linton Av	West Ryde, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Macquarie Hospital Bushland	Twin Rd	North Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Meadowbank Park Foreshore Wetland	Meadowbank Cr	Meadowbank, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Meadowbank Railway Bridge	Bowden St	Meadowbank, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Parramatta and Lane Cove Rivers Landscapes		Sydney, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Pennant Avenue Group	1-13 Pennant Av	Denistone, NSW, Australia	(Rejected Place) Register of the National Estate (Non-statutory archive)
Riverview House, Outbuildings and Garden	135 Marsden Rd	West Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Rockend	38-50 Punt Rd	Gladesville, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Rydale House (former)	Bellevue Av	West Ryde, NSW, Australia	(Destroyed) Register of the National Estate (Non-statutory archive)
Ryde Police Station (former)	808 Victoria Rd	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Ryde Public School 1877-1919 Buildings	Pope St	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Annes Anglican Church and Churchyard	42-46 Church St	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
The Hermitage and Garden	1 Pennant Av	Denistone, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Willandra	782 Victoria Rd	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Wollondilly and Garden	13 Pennant Av	Denistone, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)

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APPENDIX D FLORA AND FAUNA LIST FOR LOOKING GLASS BAY PARK

From Biosphere environmental Consultants (2008)

FLORA

NATIVE PLANT SPECIES LIST Looking Glass Bay Park			
FAMILY	**SPECIES NAME**	**COMMON NAME**	**CS**
Pteridiophytes			
ADIANTACEAE	*Adiantum aethiopicum*	Maidenhair Fern	C
CYATHEACEAE	*Cyathea australis*	Rough Treefern	C
DICKSONIACEAE	*Calochlaena dubia*	False Bracken Fern	C
Gymnosperms			
CUPRESSACEAE	*#Callitris rhomboidea*	Port Jackson Pine	

Looking Glass Bay Park			
Angiosperms-Dicotyledons			
AIZOACEAE	*Tetragonia tetragonoides (saltmarsh)*	New Zealand Spinach	S
AVICENNIACEAE	*Avicennia marina* var *australasica*	Grey Mangrove	C
BIGNONIACEAE	*Pandorea pandorana*	Wonga Wonga Vine	C
CAMPANULACEAE	*Wahlenbergia gracilis*	Native Bluebell	C
CASUARINACEAE	*Allocasuarina littoralis*	Black She-Oak	C
	Casuarina glauca	Swamp She-Oak	C
CHENOPODIACEAE	*Einadia hastata*		S
	Sarcocornia quinqueflora ssp *quinqueflora (saltmarsh)*	Samphire	S
	Suaeda australis (saltmarsh)	Austral Seablite	U
CONVOLVULACEAE	*Dichondra repens (s.lat.)*	Kidney Weed	S
	+Wilsonia backhousei (saltmarsh)	Narrow-leaved Wilsonia	R
CUNONIACEAE	*Callicoma serratifolia*	Black Wattle	C
	Ceratopetalum gummiferum	NSW Christmas Bush	C
ELAEOCARPACEAE	*Elaeocarpus reticulatus*	Blueberry Ash	C
EUPHORBIACEAE	*Breynia oblongifolia*	Coffee Bush	C
	Glochidion ferdinandi	Cheese Tree	C
	Homalanthus populifolius	Bleeding Heart	S
FABACEAE	*Acacia decurrens*	Sydney Green Wattle	
	Acacia floribunda	White Sallow Wattle	
	Acacia longifolia	Sydney Golden Wattle	C
	Acacia parramattensis	Parramatta Green Wattle	C
	Acacia stricta	Straight Wattle	U
	Acacia ulicifolia	Prickly Moses	C
	#Glycine microphylla		
	Kennedia rubicunda	Dusky Coral Pea	C
MORACEAE	*Ficus rubiginosa*	Port Jackson Fig	S
MYRSINACEAE	*Rapanea variabilis*	Mutton Wood	S
MYRTACEAE	*Acmena smithii*	Lillypilly	U
	Angophora costata	Sydney Red Gum	C
	Angophora floribunda	Rough-barked Apple	S
	Backhousia myrtifolia	Grey Myrtle	S
	#Eucalyptus botryoides	Bangalay, Southern Mahogany	
	Eucalyptus pilularis	Blackbutt	S
	Eucalyptus saligna	Sydney Blue Gum	S
	Eucalyptus tereticornis	Forest Red Gum	R
	Kunzea ambigua	Tickbush	C
	#Melaleuca quinquenervia (p)	Broad-leafed Paperbark	

	Melaleuca stypheloides	Prickly-leaved Paperbark	U
	Syncarpia glomulifera	Turpentine	S
	Tristaniopsis laurina	Water Gum	C
OLEACEAE	*Notelaea longifolia*	Mock Olive	C
PITTOSPORACEAE	*Bursaria spinosa*	Blackthorn	C
	Pittosporum revolutum	Rough-fruit Pittosporum	S
	Pittosporum undulatum	Sweet Pittosporum	C
PRIMULACEAE	*Samolus repens (saltmarsh)*	Creeping Brookweed	C
PROTEACEAE	*Banksia integrifolia*	Coast Banksia	C
	Grevillea sericea	Pink Spider Flower	C
	Hakea salicifolia ssp *salicifolia*	Willow-leaved Hakea	S
	Hakea sericea	Bushy Needlebush	C
	Persoonia linearis	Narrow-leaved Geebung	C
RHAMNACEAE	*Pomaderris sp.*	Pomaderris	
ULMACEAE	*Trema tomentosa* var. *viridis*	Poison Peach	
Angiosperms-Monocotyledons			
COMMELINACEAE	*Commelina cyanea*	Scurvy Weed	S
CYPERACEAE	*Baumea juncea* (saltmarsh)	Bare Twig-rush	S
	Isolepis cernua	Nodding Club Rush	R
	Sporobolus virginicus (saltmarsh)	Sand Couch, Salt-grass	S
JUNCACEAE	*Juncus kraussii* (saltmarsh)	Sea Rush	S
	#Juncus usitatus		
JUNCAGINACEAE	*Triglochin striata* (saltmarsh)	Streaked Arrow-grass	U
LOMANDRACEAE	*Lomandra longifolia*	Mat Rush	C
PHILESIACEAE	*Eustrephus latifolius*	Wombat Berry	C
PHORMIACEAE	*Dianella caerulea*	Blue Flax Lily	C
POACEAE	*Entolasia marginata*		S
	Microlaena stipoides var. *stipoides*	Weeping Grass	C

EXOTIC AND NON-LOCAL NATIVE PLANTS LOOKING GLASS BAY PARK		
FAMILY	**SPECIES NAME**	**COMMON NAME**
Pteridiophytes		
DAVALLIACEAE	*Nephrolepis cordifolia*	Fishbone Fern
Angiosperms-Dicotyledons		
ALSTROEMERIACEAE	*Alstroemeria pulchella*	Parrot Alstroemeria
ARACEAE	*Monstera deliciosa*	Fruit Salad Plant
ASCLEPIADACEAE	*Araujia sericiflora*	Moth Plant
ASTERACEAE	*Aster subulatus*	Bushy Starwort
	Bidens pilosa	Cobbler's Pegs
	Crassocephalum crepidioides	Thickheads
	Galinsoga parviflora	Potato Weed
	Gnaphalium sp.	Cudweed
	Hypochaeris radicata	Catsear
	Taraxacum officiale	Dandelion

BASELLACEAE	*Anredera cordifolia*[4]	Madeira Vine
BIGNONIACEAE	*Jacaranda mimosifolia*	Jacaranda
CAPRIFOLIACEAE	*Lonicera japonica*	Honeysuckle
CARYOPHYLLACEAE	*Cerstium glomeratum*	Mouse Ear Chickweed
	Stellaria media	Chickweed
CONVOLVULACEAE	*Ipomoea indica*[4]	Blue Morning Glory
EUPHOBIACEAE	*Ricinus communis*[4]	Castor Oil Plant
FABACEAE subfamily CAESALPINOIDEAE	*Senna pendula* var *glabrata*[4]	Easter Senna
FUMARIACEAE	*Fumaria sp*	Fumitory
LAURACEAE	*Cinnamomum camphora*[4]	Camphor Laurel
MALVACEAE	*Sida rhombifolia*	Paddy's Lucerne
MORACEAE	*Ficus elastica*	Rubber Tree
	Morus albus	White Mulberry
MYRTACEAE	**Eucalyptus microcorys*	Tallow Wood
OLEACEAE	*Ligustrum lucidum*[4]	Broad-leaved Privet
	Ligustrum sinense[4]	Small-leaved Privet
	Olea europaea ssp *cuspidata*[4]	African Olive
OXALIDACEAE	*Oxalis corniculata*	Yellow Wood Sorrel
PLANTAGINACEAE	*Plantago lanceolata*	Lamb's Tongue
PROTEACEAE	** Grevillea robusta*	Silky Oak
	Grevillea Robyn Gordon	
SAPINDACEAE	*Cardiospermum grandiflorum*[4]	Balloon Vine
SOLANACEAE	*Cestrum parqui*[3]	Green Cestrum
	Solanum mauritianum	Wild Tobacco
	Solanum nigrum	Blackberry Nightshade
ULMACEAE	*Celtis sp.*	
URTICACEAE	*Parietaria judaica*[4]	Sticky Weed
VERBENACEAE	*Verbena sp*	Purple Top
Angiosperms-Monocotyledons		
ASPARAGACEAE	*Asparagus aethiopicus*[4]	Asparagus Fern
	Asparagus plumosus	Climbing Asparagus
COMMELINACEAE	*Tradescantia fluminensis*[4]	Trad, Wandering Jew
LILIACEAE	*Alstroemeria sp.*	Peruvian Lily
POACEAE	*Arundo donax*[4]	Giant Reed
	Bambusa sp.	Bamboo
	Bromus catharticus	Prairie Grass
	Cynodon dactylon	Common Couch
	Ehrharta erecta	Ehrharta, Panic Veldtgrass
	Ehrharta longiflora	Annual Veldtgrass
	Lolium sp.	Rye Grass
	Pennisetum clandestinum	Kikuyu
	Setaria sp	Pigeon Grass
	Setaria palmifolia	Palm Grass
	Stenotaphrum secundatum	Buffalo Grass

+ Listed as vulnerable under Schedule 2, Threatened Species Conservation Act, 1995
# Indicates a species not listed on Kubiak's (2005) plant list; (p) Indicates a species that has most likely been planted; * Indicates an Australian native plant that is not indigenous to Ryde municipality; Superscript numbers pertain to listed noxious weeds listed in the Weed Control Order No 19 (2005) of the Noxious Weeds Act 1993

FAUNA

Animal Group	Species	Common Name
Mammals	*Trichosurus vulpecula*	Brush-tail Possum
	Pseudecheirus peregrinus	Ring-tail Possum
	Mus musculus	House Mouse *
	Canis lupus familiaris	Dog *
	Oryctalagus cuniculus	Rabbit *
	Pteropus poliocephalus	Grey-headed Flying Fox
Birds	*Anas supercilliosa*	Pacific Black Duck
	Threskiornis aethiopica	White Ibis
	Grallina cyanoleuca	Magpie Lark
	Vanellus miles	Masked Lapwing
	Cacatua galerita	Sulphur-crested Cockatoo
	Platycercus elegans	Crimson Rosella
	Trichoglossus haematodus	Rainbow Lorikeet
	Eudynamys scolopacea	Koel
	Podargus strigoides	Tawny Frogmouth
	Dacelo novaeguinea	Laughing Kookaburra
	Pardalotus punctata	Spotted Pardalote
	Manorina melanocephalus	Noisy Miner
	Phylidonyris novaehollandiae	New Holland Honeyeater
	Acanthorhynchus tenuirostris	Eastern Spinebill
	Anthochaera carunculata	Red Wattlebird
	Rhipidura leucophrys	Willie Wagtail
	Coracina novaehollandiae	Black-faced Cuckoo Shrike
	Cracticus torquatus	Grey Butcherbird
	Gymnorhina tibicen	Australian Magpie
	Strepera graculina	Pied Currawong
	Corvus coronoides	Australian Raven
	Acidotheres tristis	Common Myna *
	Passer domestica	House Sparrow *
	Streptopelia chinensis	Spotted Turtle-dove *
Reptiles	*Lampropholis delicata*	Garden Skink
	Lampropholis guichenoti	Grass Skink
	Eulamprus quoyii	Eastern Water Skink
Frogs	*Crinia signifera*	Common Eastern Froglet
Fish		Nil

APPENDIX E 7 PART TEST ASSESSMENT OF SIGNIFICANCE

Assessment of Significance (TSC Act)

Section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) specifies seven factors to be taken into account in deciding whether a development is likely to have a significant impact on threatened species, populations or ecological communities, or their habitats listed on the *Threatened Species Act 1995* (TSC Act).

The following Assessment of Significance assesses the level of likely impact associated with the proposed Ryde River Walk through Looking Glass Bay Park on the Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions endangered ecological community (EEC).

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

N/A

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

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

i) The foreshore of Looking Glass Bay at the proposal site near Bernard Avenue includes an area of approximately 150 square metres of coastal saltmarsh which is currently impacted from trampling due to unrestricted access. The proposed boardwalk would span the saltmarsh community which would minimise future impacts. Recommendations to either ensure piling within the community avoids any specific plants or preferably no piling occurs within the saltmarsh area and the boardwalk completely spans over the top have been included as safeguards. The boardwalk would be around 1.5 metres wide and constructed of mesh which would minimise potential shading impacts. The use of boardwalks is recommended in the best practice guidelines for coastal satmarsh (DECC 2008) to minimise and/or avoid impacts due to unrestricted pedestrian access.

The construction of the boardwalk would require access and the use of machinery around the saltmarsh. This has the potential to directly impact the saltmarsh community. Safeguards would be put in place during construction to avoid unrestricted access to some areas of the saltmarsh in order to minimise any potential impacts.

The proposal is unlikely to effect the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction**.**

ii) The EEC is currently impacted by weed incursion. The proposed construction activities have the potential to increase potential weeds in the area if construction plant and workers move from weed infested areas and bring weedy propagules to the site. Mitigation measures would be put in place to minimise this risk such as cleaning of construction plant prior to entering coastal saltmarsh area. Other management measures such as weed management have also been proposed.

The proposal is 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.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

i) The proposal is unlikely to remove or modify the habitat of the EEC to a substantial degree. The piles of the boardwalk would be small and it has been recommended that the boardwalk completely span the saltmarsh with no piling to occur within the community.

ii) The proposed boardwalk would be raised and therefore no area of habitat would become fragmented as a result of the proposal.

iii) The intertidal habitat and landward areas are important to the long term survival of coastal saltmarsh. The disturbance of this habitat as a result of the proposal is unlikely to impact the long term survival of the community. The raised boardwalk would improve the long term survival of this community by restricting pedestrian access which has caused some disturbance to the saltmarsh.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No areas of critical habitat have been declared for the study area.

f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.

No recovery plan or threat abatement plan has been prepared for this EEC.

.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Potential key threatening processes relevant to the proposal include:

- Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands.

The proposal would include the construction of a boardwalk over water in the intertidal zone of Looking Glass Bay. The boardwalk would require some piling. The piles would be of a limited size and the boardwalk would be constructed at a sufficient level over the Mean High Water Mark that the natural tidal flows would not be impacted. Safeguards have been recommended to ensure the design takes into account the potential impacts of sea level rise.

The disturbances during construction as a result of piling and the use of a barge is unlikely to have major impact on flows and would be temporary.

Conclusion

The Assessment of Significance has concluded that the proposal is not likely to significantly affect the Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions, directly or indirectly with the implementation of safeguards as recommended in this REF.

Based on this assessment a Species Impact Statement is not required.

References

DECC (2008). Best practice guidelines for coastal saltmarsh.

APPENDIX F MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the environmental assessment provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Sustainability, Environment, Water, Population and Communities.

Factor	Impact
a. Any impact on a World Heritage property? There are no World heritage properties in the locality.	Nil
b. Any impact on a National Heritage place? There are no National Heritage places in the locality.	Nil
c. Any impact on a wetland of international importance? There are no wetlands of international importance in the locality.	Nil
d. Any impact on a listed threatened species or communities? There are no listed threatened species or communities that have the potential to be impacted by the proposal.	Nil
e. Any impacts on listed migratory species? There are no listed migratory that have the potential to be impacted by the proposal.	Nil
d. Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the locality.	Nil
g. Does the proposal involve a nuclear action (including uranium mining)? The proposal does not involve a nuclear action.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? There would be no impact on Commonwealth land.	Nil

City of Ryde

Statement of environmental effects

RYDE RIVERWALK - BILL MITCHELL PARK TO GLADES BAY PARK

NOVEMBER 2012

ngh environmental

Document Verification

Project Title: Ryde Riverwalk – Bill Mitchell Park to Glades Bay Park Review of Environmental Factors

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FIGURES

1 INTRODUCTION

1.1 PROPOSAL IDENTIFICATION

The City of Ryde Council proposes to construct a section of the Ryde River Walk Master Plan (Pod Landscape Architecture et al 2007). The Ryde River Walk aims to connect existing foreshore parks along Parramatta River from Wharf Road to the west to Punt Road to the east in the Ryde Local Government Area (LGA). The Master Plan developed a strategy for the staged implementation of the River Walk. This statement of environmental effects (SEE) assesses the Bill Mitchell Park and Glades Bay Park River Walk tracks (Figure 1-1).

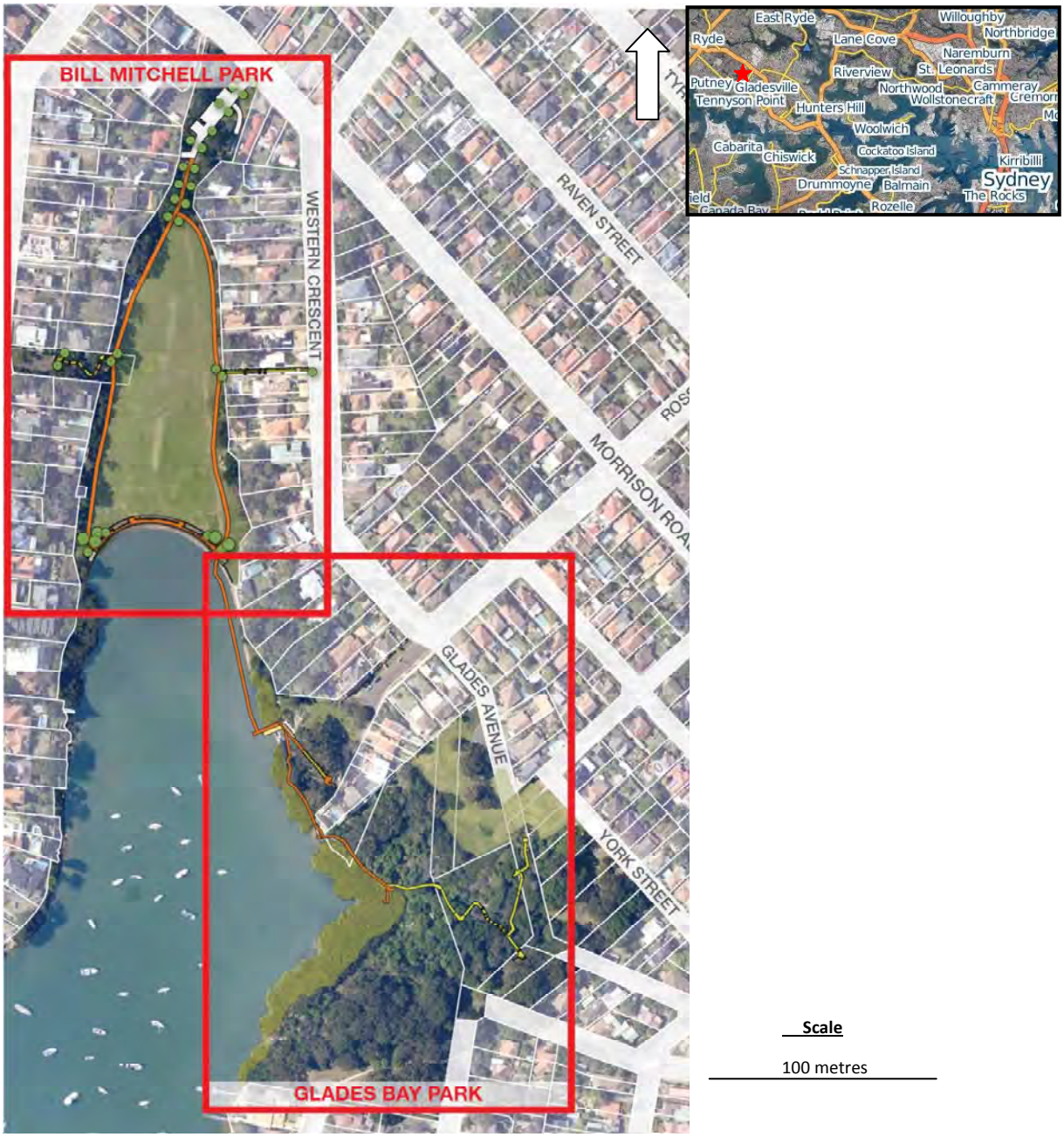


Figure 1-1: Proposal location (Source: Aspect 2012).

The proposal area is characterised by the following:

- Bill Mitchell Park is a recreational park along the foreshore of Glades Bay and accessed from local roads to the east, west and north.
- Ross Street Reserve contains a dinghy storage area and a boat launch area.
- Glades Bay Park contains remnant urban bushland and is located along the foreshore of Glades Bay. The park includes a series of dirt track linkages and includes Aboriginal heritage items and protected vegetation (mangroves and saltmarsh). The park contains small creeks with existing bridges.
- Residential properties with direct views or access to Bill Mitchell Park and/or Glades Bay Park.
- Glades Bay which includes private boat moorings. These moorings are accessed by dinghies stored along the eastern foreshore of Glades Bay between Bill Mitchell Park and Glades Bay Park.

The proposed works would include:

- Formalisation of existing tracks in Bill Mitchell Park and Glades Bay Park.
- Construction of a boardwalk along the foreshore of Glades Bay linking Bill Mitchell Park to Glades Bay Park.

Further details of the proposed works are provided in Chapter 3.

The proposal would be funded using contributions from the local, state and federal funds.

1.2 PURPOSE OF THE REPORT

This statement of environmental effects (SEE) has been prepared by **ngh**environmental on behalf of City of Ryde Council.

The purpose of the SEE is to describe the proposal, to document the likely impacts of the proposal on the environment, and to detail protective measures to be implemented.

The description of the proposed works and associated environmental impacts have been undertaken in context of Division 2 of the *Environmental Planning and Assessment Act 1979*, the *Threatened Species Conservation Act 1995* (TSC Act), *the Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This proposal is not a designated development as specified under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* and therefore requires a Statement of Environmental Effects (SEE). This SEE has been prepared under Part 4 of the EP&A Act and addresses the obligations of the consent authority (City of Ryde) under Section 79C.

2 OBJECTIVES AND OPTIONS CONSIDERED

2.1 STRATEGIC SETTING

The Ryde River Walk Master Plan (Pod Landscape Architecture et al 2007) (the Master Plan) adopted by Council has been progressively implemented since 2007. The purpose of the Master Plan was to provide an opportunity to create an engaging and important regional route along the Parramatta River foreshore and to link existing parks, reserves and public spaces through a regional system of recreational trails. It was prepared with input from local residents and interested groups.

The Master Plan was based on strategic government planning instruments and guidelines such as:

- Sharing Sydney Harbour Access Plan (DIPNR 2003)
- Sydney Harbour Catchment Sydney Regional Environmental Plan (DoP 2005)
- Sydney Metropolitan Recreational Trails Framework (DIPNR 2005, updated 2011)
- Walking Sydney Harbour (State and Local Government)
- Metro Strategy (DoP 2005)
- Australian National Cycling Strategy 2005-2012 (Austroads 2005)

The objectives of the Master Plan included:

- Public Health Benefits:
  - Reinforce the link between the environment and the health of the community members.
  - Increase the range of users in terms of age, fitness and physical ability.
  - Link to health initiatives- encouraging walking, cycling as a means of transport though linking uses.
- Recreational benefits:
  - Increase use and connectivity between open spaces.
  - Increase legibility of a network of trails around the foreshore of Ryde LGA.
  - Increase regional recreational areas.
- Ecological Enhancement:
  - Link to initiatives that improve the physical environment.
  - Increase the understanding of the ecological values of the area.
- Transport:
  - Increase the networks of routes.
  - Provide increase in access to sites.
- Cultural vitality:
  - Creating events and community programs.
- Educational value:
  - Increase understanding through interpretation of our history.
  - Increase understanding of the ecology and cultural values of the Parramatta River.

Bill Mitchell Park and Glades Bay Park form part of the Master Plan and are the two of the last four remaining park upgrades to complete the entire Ryde River Walk (the other two are Looking Glass Bay and Banjo Patterson Park).

2.2 PROPOSAL OBJECTIVES

The objectives of the proposal are to:

- Implement the Ryde River Walk Master Plan.
- Provide an intimate scaled pathway that formalises an existing trail.
- Maximise the extent of an accessible pathway for all users where slopes permit (e.g. wheelchair access).
- Respect the neighbouring property interface through careful siting of the pathway and boardwalk.
- Ensure that the pathway is located to prevent impact on historical (both Aboriginal and Colonial) artefacts.
- Locate and design the pathway to minimise impact on vegetation. Locating the pathway away from the most important vegetation communities (mangroves and saltmarsh).
- Provide a variety of experiences along the pathway, with opportunities to rest, read about the local history and absorb the views.
- Provide car parking to prevent impacts on local roads for users of the path.
- Provide a design that is unique to Ryde, and unified in its character.
- Provide a scheme that is sustainable; is robust and achieves a 50 year life span.
- Enhance the natural environment through provision of additional tree and understorey planting.

2.3 OPTIONS CONSIDERED

Aspect Landscape Architects developed a series of options for implementing the Ryde River Walk at Bill Mitchell Park and Glades Bay Park that took into account results of community consultation undertaken in late 2011 and early 2012. Three options were developed and presented to the local community at a workshop in late May 2012 for discussion (options 2-4 below). A fourth option (Option 5) was developed as a result of the latter workshop. Refer to Chapter 5 for community consultation details.

2.3.1 Consideration of alternatives

Option 1: Do nothing

The 'Do Nothing' option would not complete the Master Plan or meet the objectives of the proposal. There would be no construction impacts.

Option 2 (preferred option): Upgrade Bill Mitchell Park and Glades Bay Park and provide a link between the two along the foreshore of Glades Bay by using a mix of raised boardwalk and tracks (Overwater/on-grade boardwalk mix).

The option's characteristics include the following:

- On grade path from Bill Mitchell Reserve.
- Elevated boardwalk in the intertidal zone between high and low tide between Bill Mitchell Reserve and Ross Street only.

- Avoids the seawall.
- Pedestrian access.
- Provide dinghy launch area at Ross Street Reserve.
- Avoiding the mangrove stands.
- Connects back to existing desire line through Glades Bay Park.

Option 3: Upgrade Bill Mitchell Park and Glades Bay Park and provide a link between the two along the foreshore of Glades Bay by using a raised boardwalk (boardwalk over water).

The option's characteristics include the following:

- On grade path from Bill Mitchell Reserve
- Elevated boardwalk extension in the intertidal zone between high and low tide between Bill Mitchell Reserve and Glades Bay Park.
- Avoids the seawall.
- Pedestrian access.
- Possibility of a small jetty structure to connect with Ross Street.
- Avoiding the mangrove stands.
- Connects back to existing desire line through Glades Bay Park.

Option 4: Upgrade Bill Mitchell Park and Glades Bay Park and restrict access between the two parks to on grade paths and local streets (no foreshore linkages using boardwalks).

The option's characteristics include the following:

- On grade path from Bill Mitchell Reserve, up to Western Crescent.
- No elevated marine zone boardwalk.
- 'No access' signage for Council liability requirements.
- No equitable access to foreshore (except from Bill Mitchell reserve).
- Possibility of a small jetty structure to connect with Ross Street.
- Avoiding the mangrove stands.
- Connects back to existing desire line from Ross Street through Glades Bay Park.

Option 5: Upgrade Bill Mitchell Park and Glades Bay Park and restrict access between the two parks to on grade paths and local streets but include a boardwalk over water between Ross Street and Glades Bay Park.

The option's characteristics include the following:

- On grade path from Bill Mitchell Reserve, up to Western Crescent.
- Elevated boardwalk extension in the intertidal zone between high and low tide between Ross Street and Glades Bay Park.
- 'No access' signage for Council liability requirements.

- No equitable access to foreshore (except from Bill Mitchell reserve.
- Possibility of a small jetty structure to connect with Ross Street.
- Avoiding the mangrove stands.
- Connects back to existing desire line from Ross Street through Glades Bay Park.

Table 2-1 provides an analysis of the disadvantages and advantages of each option.

2.4 PREFERRED OPTION

All options would meet the objectives of the proposal. However, only options 2 and 3 would fully comply with the Master Plan by providing a foreshore link between Bill Mitchell Park and Glades Bay Park. Compared to option 3, option 2 would limit the length of boardwalk over the water and instead upgrade existing tracks where possible. This has the potential to minimise some environmental impacts. Based on the options analysis (Table 2-1), option 2 is the preferred option.

Table 2-1: Options analysis

	Option 2 (preferred option)	Option 3	Option 4	Option 5
Advantages	• Provides foreshore access between Bill Mitchell Park and Glades Bay Park. • Formalises existing paths which would minimise potential disturbances to vegetation, local heritage items and residents during operation. • Potential for the reestablishment of protected saltmarsh and its habitat previously disturbed through uncontrolled access. • Improvement to water access for the dinghies through the provision of a small jetty. • Boardwalk over the water has less of a visual impact compared to option 3, has a higher impact than option 4 and is similar to option 5 for residents	• Provides foreshore access between Bill Mitchell Park and Glades Bay Park. • Formalises existing paths which would minimise potential disturbances to vegetation, local heritage items and residents during operation. • Potential for the reestablishment of protected saltmarsh and its habitat previously disturbed through uncontrolled access. • Improvement to water access for the dinghies through the provision of a small jetty.	• Formalises existing paths which would minimise potential disturbances to vegetation, local heritage items and residents during operation. • Potential for the reestablishment of protected saltmarsh and its habitat previously disturbed through uncontrolled access. • Improvement to water access for the dinghies through the provision of a small jetty. • No visual impacts as a result of a boardwalk over the water. • Minimal impacts to vegetation compared to other options. • No disturbance of sediments and potential	• Provides some water access through a short section of boardwalk over the water east of Ross Street. • Formalises existing paths which would minimise potential disturbances to vegetation, local heritage items and residents during operation. • Potential for the reestablishment of protected saltmarsh and its habitat previously disturbed through uncontrolled access. • Improvement to water access for the dinghies through the provision of a small jetty. • Boardwalk over the water has less of a visual impact compared to option 3, has a higher impact than

	Option 2 (preferred option)	Option 3	Option 4	Option 5
	located on western side of Glades Bay.		water quality impacts as there would be no boardwalk over the water.	option 4 and is similar to option 2 for residents located on western side of Glades Bay.
Disadvantages	• Potential for disturbance of sediments and water quality impacts in Glades Bay during construction of boardwalk.	• Highest visual impact for residents located on western side of Glades Bay due to longest length of boardwalk compared to other options. • Potential for disturbance of sediments and water quality impacts in Glades Bay during construction of boardwalk.	• No foreshore access between Bill Mitchell Park and Glades Bay Park. • Uncontrolled foreshore access between Ross Street and Bill Mitchell Park may still be possible which could lead to further disturbance of foreshore area (saltmarsh, heritage) and safety issues for residents fronting foreshore.	• No foreshore access between Bill Mitchell Park and Glades Bay Park. • Uncontrolled foreshore access between Ross Street and Bill Mitchell Park may still be possible which could lead to further disturbance of foreshore area (saltmarsh, heritage) and safety issues for residents fronting foreshore. • Potential for disturbance of sediments and water quality impacts in Glades Bay during construction of boardwalk.
Does the option comply with the Master plan?	Yes	Yes	Partial compliance. This option would not provide a foreshore link between Bill Mitchell Park and Glades Bay Park which has	Partial compliance. This option would not provide a foreshore link between Bill Mitchell Park and Glades Bay Park which has

	Option 2 (preferred option)	Option 3	Option 4	Option 5
			been identified as a 'potential future link' in the Master Plan.	been identified as a 'potential future link' in the Master Plan.
Does the option meet the proposal objectives?	Yes	Yes	Yes	Yes

3 DESCRIPTION OF THE PROPOSAL

3.1 EXISTING ENVIRONMENT

Below is a brief description of the environment and the features on site. Site photographs are provided in Appendix A.

Bill Mitchell Park:

This is a cleared green space which contains a playing field. It is a rough triangular shape, approximately 65 metres wide at its widest point and 210 metres long. There are three pedestrian entry points into the park, at Brett Street, Western Crescent and Morrison Road. The park is relatively flat, with a slight incline towards Glades Bay which lies to the south. The surrounding residents to the north, east and west are positioned at higher elevations. The park was a former gully, and in the 1940's was lined and filled. There are small parcels of rocky outcrops scattered on the edges, most of which contain native vegetation.

Glades Bay Park:

Glades Bay Park is located along the Parramatta River along Glades Bay; it is accessed from several residential streets, including Glades Avenue and York Street. It contains a mix of natural and exotic vegetation, lawn areas and features walkways comprised of different materials (including dirt tracks, sandstone steps, steel and wooden boardwalks).

Key vegetation groups found within Glades Bay Park include:

- Coastal Saltmarsh Communities
- Mangroves
- Coastal Sandstone Gully Forrest

There are number of invasive weed species found within the parkland, and native and introduced fauna species are evident on site. There are Aboriginal Heritage items located with the park, such as rock engravings and shell middens, and also heritage items, such as the sandstone bath steps in Glades Bay.

Parramatta River and Glades Bay:

The Parramatta River catchment is highly urbanised. The water quality is greatly impacted by a number of factors. The greatest threats include stormwater pollution, weeds (including noxious and environmental weeds) and erosion and sedimentation. Glades Bay is situated on the foreshore of the Parramatta River, during low tide it turns into a tidal mud flat. Along the east foreshore boundary of the bay is a sandstone sea wall which was built in the 1940's, it extends from Bill Mitchell Park to the west end of Ross Street. Located on the banks of the bay are residential properties, Bill Mitchell Park and Glades Bay Park. A number of small private jetties are located at the mouth of the bay.

Surrounding land use:

The surrounding land use of the proposal area is predominantly low density residential properties. The closest receiver to the proposed works would be the residential properties located on the south end of Western Crescent and the west end of Ross Street.

3.2 CONSTRUCTION ACTIVITIES

3.2.1 The Proposal

A concept design is provided in Appendix B.

Bill Mitchell Park

A 2.5 metre wide concrete path would be laid around the perimeters of Bill Mitchell Park. This path would allow vehicular access for maintenance and bin collection. The path would be concrete paving with decorative diagonal sawcuts at 800mm spacings.

A car park (around 13 spaces) would be constructed at the north of the access road to the Bill Mitchell Park from Morrison Road. The surface would be asphalt. The path from the car park to the park would be constructed from concrete paving. A short length of concrete path would be constructed to the south east of the car park near Morrison Road. A new bench seat and signage plinth would be constructed at the junction of the path from the car park and the path that runs around the perimeter of the park. Trees would be planted along the car park and the path from the car park to the park.

Existing accesses to the park from Brett Street, west of the park, and Western Crescent, east of the park, would be upgraded. Sandstone flagging paving would be laid at the west end and east end of the access path from Brett Street. Five sandstone block stairs would be installed along a section of a new concrete footpath 1.5 metre wide. The three existing sandstone block stairs would remain in place. A new strip drain would also be installed at the base of the steps at the park end of the access path. A new bench and a signage plinth would be constructed in the park beside the access path from Brett Street. Concrete paving would be laid on the access to the park from Western Crescent. The existing sandstone block stairs would remain in place. A new bench seat and signage plinth would be constructed beside the access to the park. Trees would be planted at the street end and park end of the access paths from Western Crescent and Brett Street.

The existing soccer field would be rotated clockwise and moved slightly north to improve orientation (refer to Appendix B).

A bench seat would be constructed on the east and west sides of the southern side of the park along the path.

At the seawall at the southern end of the park, a gathering space, with low brick walls with integrated seating would be constructed. The surface would be crushed stabilised sandstone. A new fence with mass planting would also be provided along this section.

Native trees including *Angophora costata*, *Eucalyptus botrioydes* and *Glochidion fernandi* would be planted at the south eastern and south western corners of the park. Mass planting would also be included along the proposed concrete paths.

Ross Street reserve and boardwalk

A boardwalk over water around 100 metres long would be constructed from the southeast corner of Bill Mitchell Park to the proposed boat launching area near the existing dinghy storage area in the Ross Street reserve. The boardwalk would be 1.8 metre wide with balustrades and be constructed of fibreglass mesh panels attached to a steel frame on piles in Glades Bay.

A raised fibreglass mesh boat launch would be constructed at the existing dinghy storage area over the existing rock platform into the intertidal zone. A new bench seat would be constructed at the proposed

boat launch area. The dinghy storage area would remain at its current location and would not be increased in size.

A raised 1.5 metre fibreglass mesh boardwalk would be constructed over land from the proposed boat launch area across the foreshore to Glades Bay Park. This would protect the existing mangroves and saltmarsh in that area. The boardwalk would include a viewing platform into the intertidal mangrove area with bench seating.

A raised 1.5 metre fibreglass mesh boardwalk would be constructed over land from the proposed boat launch area to the existing access track leading to Ross Street. The existing access track to Ross Street would be upgraded by including new sandstone steps and crushed sandstone. This path would be 1.5 metres wide. Sandstone flagging and a new bench seat would be provided at the Ross Street end of the access track.

Glades Bay Park

The existing path through Glades Bay Park would be formalised by using crushed sandstone. Sandstone blocks would be installed as steps where required along the path. An existing bridge over a small creek would be replaced by a new bridge using the same material as the proposed boardwalks. The new bridge would be located adjacent to the existing bridge to protect native trees such as *Glochidion* species. The surface of two other existing bridges would also be replaced with fibreglass mesh.

The existing viewing areas surrounding the Aboriginal sites would be improved through the addition of raised platforms, interpretive signage and seating.

Four bench seats would be constructed along the path in the park.

3.2.2 Construction methodology

There is a potential for the proposed works to be undertaken in stages dependent on available funding. The final construction methodology would be refined during detailed design and following selection of a construction contractor. The following activities are likely to be required:

- Establishment of erosion and sedimentation controls.
- Establishment of compound and stockpiles sites (refer to section 3.2.7).
- Trimming of vegetation along existing paths for construction access.
- Profiling of proposed paths using excavator.
- The exposed soil subgrade over proposed paved areas and crushed sandstone surfaced pathways would be proof rolled. Proof rolling would assist in improving the near surface compaction of the soils and assist in identifying any soft or unstable areas. The use of hand held vibrating plate compactors (wacker packers) may be required in areas with restricted access.
- Construction of concrete and crushed sandstone footpaths. Concreting would be undertaken on site. Paths would be 1.5 metres wide except in Bill Mitchell Park where they would be 2.5 metres wide.
- Landscaping using trees and mass planting in Bill Mitchell Park.
- Minor relocation of existing soccer field by relocating goal posts.
- Construction of a boardwalk over water between Bill Mitchell Park and the proposed boat launch area. The boardwalk would require the use of a piling rig on a barge which would access the area

only during high tides and would be removed and anchored in deeper waters off Glades Bay or rested on the mud flat during low tides. Hollow piles would be driven through the sediment to rock. The pile casings would then be vacuumed out with the sediment stored in bins to be appropriately disposed of. The inner piles would then be reamed out into the rock to form a pile anchorage and the pile would be reinforced and concreted as per Figure 3-2 below. No piling would occur within the saltmarsh. A fibre glass mesh platform would then be fixed to the piles.

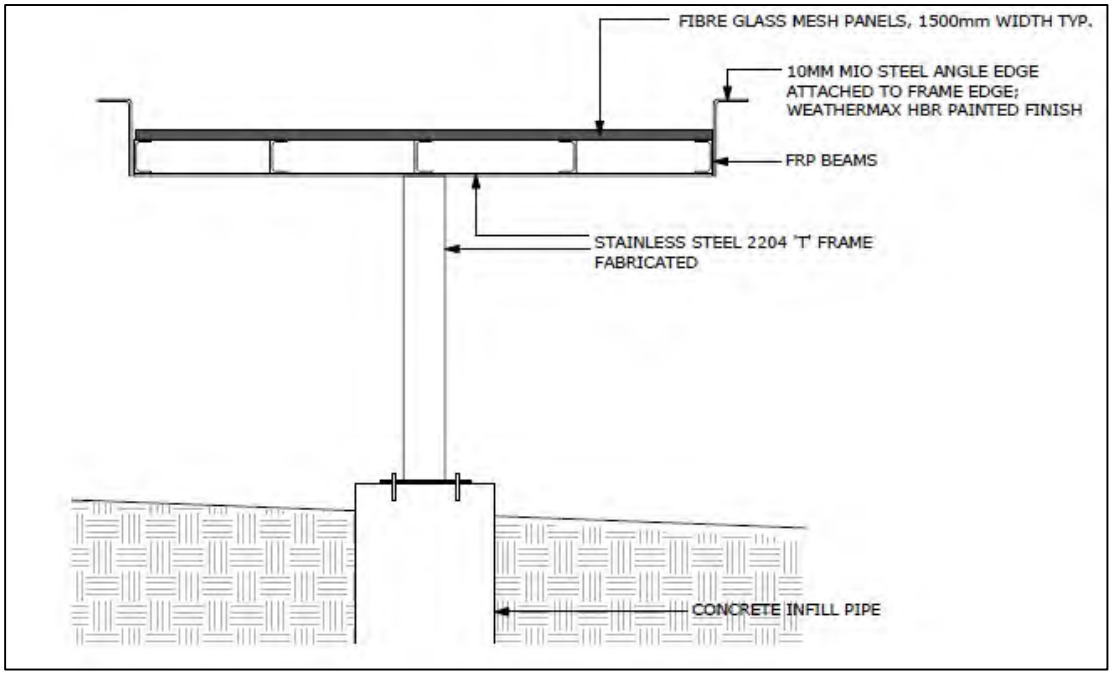


Figure 3-1 Typical section of boardwalk over water

- Construction of a boat of a raised fibreglass mesh boat launch near the existing dinghy storage area over the existing rock platform into the intertidal zone. This would require piling into the rock platform so that the boat launch is raised above the intertidal rock platform.
- Construction of a raised boardwalk and stairs over land between the proposed boat launch area and Glades Bay Park. The raised boardwalk would require small excavations (less than 1 metre deep) to create concrete footings for the piles as per Figure 3-3 below. The boardwalk would include a fibre glass mesh platform and timber and/or galvanised steel posts.

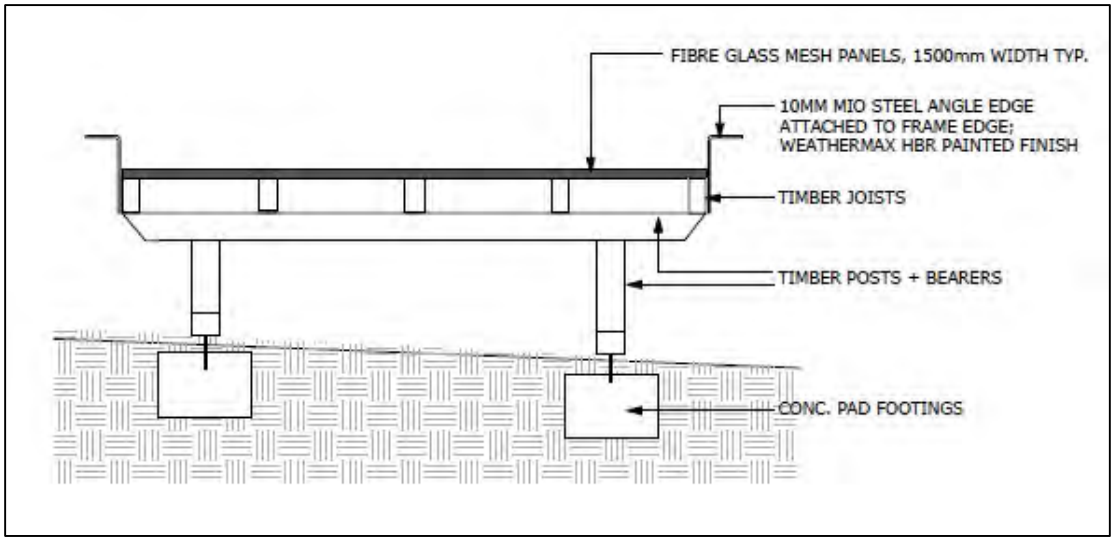


Figure 3-2 Typical section of boardwalk over land

- Replacement of the bridge over the creek with a new platform similar to the raised boardwalk described above.
- Installation of seating at strategic locations along the new paths (refer to Appendix A for locations).
- Installation of signage at a number of locations along the path paths (refer to Appendix A for locations).
- Landscaping of certain sections which would include planting of trees and native grass understorey. This would mostly be undertaken in Bill Mitchell Park (refer to Appendix A for locations).

3.2.3 Plant and equipment

- Delivery trucks
- Excavator
- Jack hammer
- Hand held power tools
- Piling rig (driven)
- Light vehicles (4 wheel drive)
- Bobcat T250 loader
- Bobcat E35 excavator
- Roller
- Wacker packer
- Argo 6x6 Frontier 580 vehicle (All Terrain Vehicle)
- Small concrete truck

3.2.4 Earthworks

The upgrade of the existing path in Bill Mitchell Park and the construction of a formal path in Glades Bay Park would require minor earthworks. The existing path in Bill Mitchell Park would be removed with an

excavator, and the excavated material stockpiled at the stockpile site prior to disposal at an appropriately licensed waste facility.

The ground in Glades Bay Park would need to be profiled prior to the laying of the crushed sandstone. This would involve only minor earthworks with a Bobcat excavator. Minor excavation (less than 1 metre deep) would be required for boardwalk footings.

3.2.5 Traffic and access

The proposed works would require construction vehicles and delivery trucks to access areas as close to the site as possible, this would be via the local road network including Morrison Road, York Street, Ross Street, Western Crescent and Brett Street. Due to the nature of the site, access for heavy machinery is very limited, most of the equipment and materials would have to be carried down by construction personnel and installed with small sized equipment, this method would reduce the construction footprint of the project, however, this would mean a longer construction time period.

The piling rig would access the site by barge. The barge would be floated into place at high tide for piling to take place. The barge would then rest on the river bed at low tide.

The path in Glades Bay would be constructed using Bobcats with access along existing informal paths.

3.2.6 Public utility adjustment and property acquisition

No public utility adjustment or property acquisition is required for the proposed works. None of the proposed works would be undertaken on private property. A section of the boardwalk would be below Mean High Water Mark which is managed by the Roads and Maritime Services (RMS) (Maritime division). Council would be required to enter into a tenure agreement for the use of this land.

3.2.7 Ancillary Facilities

The location of the compound site has not been decided. Once a site has been chosen the council environment manager would assess the site and potential impacts and determine any management measures for its establishment and removal. The following provides guidance for the selection of an appropriate site:

- The compound site would be established on level ground away from any drainage lines and drain inlets.
- The compound site would be established at least 40 metres from any waterways.
- No vegetation would be cleared for the establishment of the compound site and it would not be established underneath the dripline of any trees.
- Preference would be given to establishing the compound site on existing hardstand area.
- The compound site would be established away from residences.

3.2.8 Construction hours and time frame

The proposed works would be conducted within the working hours defined below only. No night works would be required.

Monday to Friday – 7AM to 5PM

Saturday- 8AM to 1PM
Sundays and Public Holidays- No work

The construction period and total duration of works is unknown. There is a potential for the proposed works to be undertaken in stages. This would depend on available funding.

4 STATUTORY AND PLANNING FRAMEWORK

4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

This proposal is not a designated development as specified under Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* and therefore requires a Statement of Environmental Effects (SEE). This SEE has been prepared under Part 4 of the EP&A Act and addresses the obligations of the consent authority (City of Ryde Council) under Section 79C. The development activity requires consent; however the proposal is integrated development as it may requires an approval (permit) under the *Fisheries Management Act 1994* (s *219*).

The proposal has the potential to impact on various aspects of the environment. Schedule 1, Part 1, Section 2 (4) of the *Environmental Planning and Assessment Regulation 2000*, identifies that an SEE must indicate the following matters:

(a) the environmental impacts of the development,

(b) how the environmental impacts of the development have been identified,

(c) the steps to be taken to protect the environment or to lessen the expected harm to the environment,

(d) any matters required to be indicated by any guidelines issued by the Director-General for the purposes of this clause.

This SEE has taken into account the principles and objectives according to the statutory requirements specified under Part 4 of the EP&A Act and Schedule 1 of the EP&A Regulation, to consider environmental impact.

(a) In preparing this SEE, the Department of Urban Affairs and Planning Best Practice Guidelines for Part 5 of the *Environmental Planning and Assessment Act 1979* "*Is an EIS Required*" has been utilised as a guide, to ensure that issues relevant to the NSW Office of Environment and Heritage (OEH) have also been addressed.

City of Ryde is proposing to assess the development under Part 4 of the EP&A Act. Division 2 of Part 4 describes the procedure for development requiring consent. For the purpose of the development, City of Ryde is the consent authority for works above the mean high water mark and RMS (Maritime division) is the consent authority for works below the mean high water mark.

4.2 STATE ENVIRONMENTAL PLANNING POLICIES

4.2.1 Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (deemed SEPP since 1 July 2009)

Glades Bay, where the boardwalk over the water would be located is in the area covered by Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (SREP Sydney Harbour Catchment). The location of the proposed works is zoned W1 Maritime Waters.

Any development carried out below the mean high water mark such as the proposed boardwalk is classed as water-based development. Clause 5 states that the consent authority for water based

development is NSW Roads and Maritime Services (Maritime division). Clause 18 confirms that development consent is required for the development of public boardwalks.

Under Division 2 of SREP Sydney Harbour Catchment the flowing matters must be considered by a consent authority assessing an activity under Part 4 of the EP&A Act:

- Biodiversity, ecology and environmental protection
- Public access to, and use of, foreshores and waterways
- Maintenance of a working harbour
- Interrelationship of waterway and foreshore uses
- Foreshore and waterways scenic quality
- Maintenance, protection and enhancement of views
- Boat storage facilities

These matters have been considered in this SEE and the development of management measures.

4.2.2 State Environmental Planning Policy No. 19 – Bushland in Urban Areas

The general aim of this policy is to protect and preserve bushland within the *Schedule 1* listed urban areas. This State Environmental Planning Policy (SEPP) applies to the Ryde LGA.

The specific aims of this policy are:

(a) to protect the remnants of plant communities which were once characteristic of land now within an urban area,

(b) to retain bushland in parcels of a size and configuration which will enable the existing plant and animal communities to survive in the long term,

(c) to protect rare and endangered flora and fauna species,

(d) to protect habitats for native flora and fauna,

(e) to protect wildlife corridors and vegetation links with other nearby bushland,

(f) to protect bushland as a natural stabiliser of the soil surface,

(g) to protect bushland for its scenic values, and to retain the unique visual identity of the landscape,

(h) to protect significant geological features,

(i) to protect existing landforms, such as natural drainage lines, watercourses and foreshores,

(j) to protect archaeological relics,

(k) to protect the recreational potential of bushland,

(l) to protect the educational potential of bushland,

(m) to maintain bushland in locations which are readily accessible to the community, and

(n) to promote the management of bushland in a manner which protects and enhances the quality of the bushland and facilitates public enjoyment of the bushland compatible with its conservation.

In accordance with clause 6, a person shall not disturb bushland zoned or reserved for public open space purposes without the consent of the council. Furthermore, a consent authority shall not consent to the carrying out of development unless:

(a) it has made an assessment of the need to protect and preserve the bushland having regard to the aims of this Policy,

(b) it is satisfied that the disturbance of the bushland is essential for a purpose in the public interest and no reasonable alternative is available to the disturbance of that bushland, and

(c) it is satisfied that the amount of bushland proposed to be disturbed is as little as possible and, where bushland is disturbed to allow construction work to be carried out, the bushland will be reinstated upon completion of that work as far as is possible.

The proposed works are for the purpose of formalising existing paths within Glades Bay Park and Bill Mitchell Park. The works would have some impacts on the bushland (refer to section 6.5). However, the formal paths would result in better long term protection of the bushland and provide a formal path in the public interest. Construction impacts would be minimised by implementing the mitigation measures provided in section 6.5.

4.3 LOCAL ENVIRONMENTAL PLANS

4.3.1 Ryde Local Environmental Plan 2010

The proposed works are located within the Ryde Local Government Area (LGA) on land zoned as E2 environmental conservation, RE1 public recreation and R2 low density residential. A list of the required work activity within the zones are listed Table.

The draft LEP 2011 is currently on public exhibition.

Table 4-1 Zoning and consent requirements (Source: NSW Legislation 2011).

Zone	Category	Relevant objectives	Relevant work activity	Consent requirements:
E2	Environmental conservation	• To protect manage and restore areas of high ecological, scientific, cultural or aesthetic values. • To prevent development that could destroy, damage or otherwise have an adverse effect on those values	Formalisation of existing paths	Environmental facilities are permitted with consent.
RE1	Public recreation	• To enable land to be used for public open space or recreational purposes. • To provide a range of recreational settings and activities and compatible land uses. • To protect and enhance the natural environment for recreational purposes. • To protect and enhance the natural bushland in a way that enhances the quality of the bushland and facilitates public enjoyment of the bushland in a way that is compatible with its conservation.	Formalisation of existing paths Construction of new boardwalk	Environmental facilities and recreation areas are permitted with consent.
R2	Low density residential	• To provide for the housing needs of the community within a low density	Formalisation of existing paths and	Recreation areas permitted with consent.

Zone	Category	Relevant objectives	Relevant work activity	Consent requirements:
		residential environment. • To enable other land uses that provide facilities or services to meet the day to day needs of residents. • To ensure that the general low density nature of the zone is retained and that development for the purposes of dual occupancy (attached) and multi dwelling housing (attached) do not significantly alter the character of a location or neighbourhood. • To ensure that new development complements or enhances the local streetscape. • To maintain on sites with varying topography the two storey pitched roof form character of dwelling houses and dual occupancy (attached) developments. • To ensure that land uses are compatible with the character of the area and responsive to community needs.	landscaping	

The Ryde Local Environmental Plan (LEP) contains a number of special provisions. The clauses that are relevant to the proposed works include:

Clause 5.7 Development below mean high water mark.

Development consent is required to carry out development on any land below the mean high water mark of any body of water subject to tidal influence (including the bed of any such water). A section of the boardwalk would be located below the Mean High Water Mark.

Clause 5.9 Preservation of trees or vegetation.

A person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any tree or other vegetation to which a development control plan applies without the authority conferred by development consent or a permit granted by the Council.

The City of Ryde Development Control Plan (DCP) 2010 Part 9.6 Tree preservation applies to all land within the City of Ryde LGA. The DCP states that the following works are exempt works:

- Tree works on a tree on land owned or under the care, control and management of council where the tree works are carried out by council.

Therefore the works are considered exempt works.

Tree works include:

- Any pruning of the crown of a tree (except for deadwood in accordance with section 2 of this part of the DCP).
- Any removal of a tree.

- Any pruning or removal of roots (greater than 40mm in diameter) from a tree inside its tree protection zone.
- Any alteration (excavation or fill) to the soil level within the tree protection zone of a tree on the land or on adjoining land.

Clause 6.1 Acid sulphate soils

Development consent is required for certain types of works depending on the class of land identified on the council's acid sulphate soils map. Bill Mitchell Park is identified as a Class 2 land while all other areas of the proposal (except for the bed of Looking Glass Bay) are Class 5 land.

Development consent is required on class 2 land for works below the natural ground surface or works by which the watertable is likely to be lowered. Some works below the natural ground surface would be required as part of the works in Bill Mitchell Park. However, development consent is not required under this clause to carry out any works unless:

(a) the works involve the disturbance of more than 1 tonne of soil, such as occurs in carrying out agriculture, the construction or maintenance of drains, extractive industries, dredging, the construction of artificial water bodies (including canals, dams and detention basins) or foundations or flood mitigation works, or

(b) the works are likely to lower the watertable.

The works are unlikely to trigger either (a) or (b) and therefore consent is not required.

Development consent is required on class 5 land for works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the watertable is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land. While works in this class of land would be within 500 metres of Class 2 land they are unlikely to lower the watertable below 1 metre Australian Height Datum on the adjacent Class 2 land therefore consent is not required.

Clause 6.2 Earthworks

Development consent is required for earthworks unless:

(a) the work does not alter the ground level (existing) by more than 300 millimetres, or

(b) the work is exempt development under this Plan or another applicable environmental planning instrument, or

(c) the work is ancillary to other development for which development consent has been given.

Earthworks are ancillary to the proposed development for which consent is required.

Clause 6.3 Foreshore building line (FBL)

The objective of this clause is to ensure that development in the foreshore area will not impact on natural foreshore processes or affect the significance and amenity of the area.

Development consent must not be granted for development on land in the foreshore area except for the following purposes:

(a) the alteration or rebuilding of an existing building wholly or partly in the foreshore area,

(b) sea retaining walls, wharves, slipways, jetties, waterway access stairs, swimming pools (at or below ground level (existing)), fences, boat sheds, cycleways, walking trails or picnic facilities.

Furthermore, development consent must not be granted for the above unless the consent authority is satisfied that:

(a) the development will contribute to achieving the objectives for the zone in which the land is located, and

(b) the appearance of any proposed structure, from both the waterway and adjacent foreshore areas, will be compatible with the surrounding area, and

(c) the development will not cause environmental harm such as:

(i) pollution or siltation of the waterway, or

(ii) an adverse effect on surrounding uses, marine habitat, wetland areas, flora or fauna habitats, or

(iii) an adverse effect on drainage patterns, and

(d) the development will not cause congestion of, or generate conflicts between, people using open space areas or the waterway, and

(e) opportunities to provide continuous public access along the foreshore and to the waterway will not be compromised, and

(f) any historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance of the land on which the development is to be carried out and of surrounding land will be maintained, and

(g) in the case of development for the alteration or rebuilding of an existing building wholly or partly in the foreshore area, the alteration or rebuilding will not have an adverse impact on the amenity or aesthetic appearance of the foreshore.

The proposal would require the construction of boardwalks and formalisation of access tracks within the foreshore building line (refer to for location of FBL). Consent would therefore be required. This SEE has taken into consideration the above matters when assessing the potential impacts of the proposal.

Figure 4-2 Foreshore Building Line around Bill Mitchell Park and Glades Bay Park indicated in purple.

4.3.2 City of Ryde Development Control Plan (DCP) 2010

The Development Control Plan (DCP) 2010 provides guidelines, objectives and controls for people who wish to carry out development in the City of Ryde. Table 4-2 provides the provisions of the DCP which are relevant to the proposal.

The draft DCP 2011 is currently on public exhibition.

Table 4-3 Relevant City of Ryde Development Control Plan (DCP) 2008 provisions

DCP provision	Objectives	Response
Part 2.1 Notification of development applications	The objectives of this Part are to: a. outline the public exhibition and notification procedures for development applications, applications to modify development consents and applications to review Council's determinations, b. provide opportunity for people who may be affected by a development proposal to have their comments about the proposal considered by the Council, and to c. identify 'advertised development'.	Section 5 of this SEE relates to community consultation. The consultation would be undertaken in accordance with the provisions of this part.
Part 7.2 Waste Minimisation and Management	The objectives of this part in pursuit of sustainable waste management are: Waste minimisation: 1. To minimise resource requirements and construction waste through reuse and recycling and the efficient selection and use of resources. 2. To minimise demolition waste by promoting adaptability in building design and focussing upon end of life deconstruction. 3. To encourage building designs, construction and demolition techniques which minimise waste generation. 4. To maximise reuse and recycling of household waste and	This part applies to engineering works and construction of structures and therefore applies to the proposal. Section 6.11 relates to waste management and has taken into consideration this part of the DCP.

DCP provision	Objectives	Response
	industrial/commercial waste. 5. To assist in achieving Federal and State Government waste minimisation targets in accordance with regional waste plans. 6. To minimise the overall environmental impacts of waste and foster the principles of ecologically sustainable development (ESD). Waste management: 1. To assist applicants in planning for sustainable waste management, through the preparation of a site waste minimisation and management plan. 2. To assist applicants to develop systems for waste management that ensure waste is transported and disposed of in a lawful manner. 3. To require source separation, design and location standards which complement waste collection and management services offered by the relevant service providers. 4. To provide guidance in regards to space, storage, amenity and management of waste management facilities. 5. To ensure waste management systems are easy to use and access. 6. To minimise risks associated with waste management at all stages of development.	

4.4 OTHER RELAVENT LEGISLATION

4.4.1 Threatened Species Conservation Act 1995 (TSC Act)

The *Threatened Species Conservation Act 1995* aims to conserve and protect certain classes of threatened, endangered and vulnerable species, populations and ecological communities.

An assessment of the potential impacts of the proposal on threatened species, populations, ecological communities and critical habitat listed in the TSC Act must be undertaken in accordance with section 5A of the EP&A Act (7 part test). Impacts to biodiversity are assessed in Section 6.3.

4.4.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act of 1974* aims to conserve nature, habitat, ecosystems, ecosystem processes and biological diversity at the community, species and genetic levels. Under this Act all native fauna is protected, threatened or otherwise. Schedule 13 of the act lists protected plants which shall not be harmed or picked on any land either on or off National Park estate.

With regard to threatened species a person must not:

(a) harm any animal that is of, or is part of, a threatened species, an endangered population or an endangered ecological community, or

(b) use any substance, animal, firearm, explosive, net, trap, hunting device or instrument or means whatever for the purpose of harming any such animal.

The National Parks and Wildlife Amendment Act 2010

This Act is to amend the *National Parks and Wildlife Act of 1974*, the *Threatened Species Conservation Act 1995* and various other acts to make further provision to include the protection of Aboriginal objects and places. The changes include new offences relating to harm, or desecration of, an Aboriginal object or declared Aboriginal Place. Harm includes destroying, defacing damage or moving items or places without consultation.

The Due Diligence code of Practise for the protection of Aboriginal Objects in NSW (DECCW 2010) was introduced to assist individual and organisations to exercise due diligence when carrying out activities that have the potential to harm Aboriginal Objects and to determine whether they should apply for Aboriginal Heritage Impact Permit (AHIP). An assessment of potential impacts to Aboriginal heritage items has been undertaken in section 6.9.

4.4.3 Fisheries Management Act 1994 (FM Act)

The FM Act provides conservation for fish and fish habitats and outlines approval processes for the activities that may impact on threatened species and habitats.

A permit under Part 7 of the FM Act is required if any dredging or reclamation works are to be undertaken unless these works are approved by another relevant public authority (other than a council) in which case the Minister for Primary Industries needs to be notified in accordance with Section 199 of the FM Act.

Reclamation works mean any works that involves:

(a) Using any material (such as sand, soil, silt, gravel, concrete, oyster shells, tyres, timber or rocks) to fill in or reclaim water land, or

(b) Depositing any such material on water land for the purpose of constructing anything over water land (such as a bridge), or

(c) Draining water from water land for the purpose of its reclamation.

Water land means land submerged by water:

(a) Whether permanently or intermittently, or

(b) Whether forming an artificial or natural body of water, and includes wetlands and any other land prescribed by the regulations as water land to which this Division applies.

The proposed works would involve reclamation due to the construction of a boardwalk.

A permit under Part 7 of the FM Act is required if any works are likely to harm any marine vegetation such as mangroves and saltmarsh.

4.4.4 Protection of the Environment Operations Act 1997 (PoEO Act)

Under this Act, should an activity involve the pollution of waters or have the potential to pollute waters, defined under the Act as any chemical, biological, physical change to existing water quality (i.e. turbidity, release of untreated wastewater) an Environment Protection Licence should be sought from the NSW Office of Environment and Heritage. In addition the Act relates to any pollution of the environment through noise, air and waste.

The Act also obliges the Contractor undertaking the works and the Council to notify OEH when a "pollution incident" occurs that causes or threatens "material harm" to the environment.

4.4.5 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed 'actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Section 6.3 and Appendix C of this REF.

4.4.6 Water Management Act 2000 (WM Act)

Under the WM Act a controlled activity approval is required from the NSW Office of Water for certain types of developments and activities that are carried out in or near a river, lake or estuary. Under the WM Act a controlled activity means:

> *(a) The erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or*
>
> *(b) The removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or*
>
> *(c) The deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or*
>
> *(d) The carrying out of any other activity that affects the quantity or flow of water in a water source.*

This approval must be sought prior to the commencement of works; however, public authorities including local councils are exempt from the requirements to obtain a controlled activity approval under Clause 39A of the Water Management (General) Regulation 2004. It should be noted that NSW Maritime has the power to require the organisation responsible for the works to implement remedial actions if the works have caused, or are likely to cause harm to 'protected land' or 'protected waters'.

4.4.7 Heritage Act 1977

The NSW *Heritage Act 1977* is a statutory tool designed to conserve the cultural heritage of NSW and used to regulate development impacts on the state's heritage assets. Administered by the NSW Heritage Office, the Act details the statutory requirements for protecting historic buildings and places and includes *any place, building, work, relic, movable object, which may be of historic, scientific, cultural, social, archaeological, natural or aesthetic value.*

Impacts to heritage have been assessed in section 6.10.

4.5 CONFIRMATION OF STATUTORY POSITION

City of Ryde is proposing to assess the development under Part 4 of the EP&A Act. The proposed development would require consent from the City of Ryde and RMS (Maritime division) and would be assessed under Part 4 of the EP&A Act. A development application to City of Ryde and RMS (Maritime division) would be required. Concurrence from DPI (Fisheries) as part of the DA to RMS (Maritime division) for proposed reclamation works would also be required.

5 CONSULTATION

5.1 COMMUNITY CONSULTATION

The City of Ryde has been implementing the River Walk Master Plan since 2007. The masterplan was developed to increase the recreational activities in the LGA and took into account feedback from the local and wider community.

Council carried out community consultation in the latter part of 2011 in an effort to collect, tabulate and consider any issues, ideas and thoughts the community had concerning:

- The location of the path
- The types of materials used to built the path
- Any surveying and boundary issues
- Any effects on security
- Any need to install lighting
- Which sections of the Riverwalk are suitable to cycling
- Which sections of the Riverwalk are suitable for walking
- How the path would impact upon the existing mangroves

Community feedback was used in the development of a concept design.

Further to this consultation process, the council invited 2,000 local residents and community representatives to attend community workshops held in May 2012 to discuss the proposal.

Community Workshop 1 was held on 2 May 2012 and was attended by approximately 40 people. Community Workshop 2 was held on 30 May 2012 and was attended by approximately 30 people.

The outcomes of the two workshops included:

- All the safety concerns were heard and recorded.
- All the survey and boundary concerns were heard and recorded.
- All the visual impact concerns were heard and recorded.
- Four potential locations of the path were discussed and issues with each were heard and recorded.
- All the Aboriginal heritage issues were heard and recorded.
- All the European heritage issues were heard and recorded.
- All the potential crime and unruly behaviour issues were heard and recorded.
- Precedent photos and path concepts currently in place along the Parramatta River and beyond were discussed and considered.

The workshops resulted in the development of various concept designs which have been described and assessed in section 2.3. A preferred option was then selected (section 2.4). Further consultation with the local community on the preferred option would be undertaken as described in section 5.4.

5.2 CONSULTATION WITH ABORIGINAL COMMUNITY

An Aboriginal and European Archaeological Heritage Impact Statement was prepared for the Ryde Riverwalk through Bill Mitchell Park, Glades Bay Park and Looking Glass Bay Park (Dominic Steele Consulting Archaeology 2012) in consultation with the Metropolitan Local Aboriginal Land Council (MLALC). There is a number of Aboriginal heritage sites in the vicinity of the proposal (refer to section 6.11). The Heritage Impact Statement would be reviewed by the Metropolitan Aboriginal Land Council prior to any works starting. Site-specific Heritage Impact Statements (HIS) would be prepared for site that could potentially be impacted. The HISs would be prepared in consultation with the MLALC.

5.3 GOVERNMENT AGENCY AND STAKEHOLDER INVOLVEMENT

Roads and Maritime Services (Maritime Division) are the consent authority for proposed developments below the mean high water mark. A development application, accompanied by this SEE, would be prepared for the section of boardwalk below the mean high water mark in Looking Glass Bay.

As approval from Roads and Maritime Services (Maritime Division) would be required for the proposed works below the mean high water mark, DPI (Fisheries) would need to be notified of the proposal in accordance with section 199 of the Fisheries Management Act for proposed dredging and reclamation works.

5.4 ONGOING OR FUTURE CONSULTATION

The following consultation would be undertaken:

- This SEE and the concept design would be provided to relevant stakeholders including the general public for comments for a two month period. Feedback received would be used to revise the concept design and the SEE if required.
- A development application (DA) would be prepared using the revised SEE and concept design. The DA would be exhibited in accordance with the council's procedures for notification of development applications as outlined in Part 2.1 of the DCP.

Should the DA be approved, the local community would be notified of proposed construction works through appropriate notification process including but not limited to advertisements, letter box drops and appropriate signage.

6 ENVIRONMENTAL ASSESSMENT

6.1 SOILS AND WATER QUALITY

6.1.1 Existing environment

Soil type and topography

Bill Mitchell Park is a relatively flat grassed park north of Glades Bay located at the bottom of a gully. The land that bounds the park rises on the north, east and west sides to the surrounding residential areas. There is an existing concrete path that runs around the perimeter of Bill Mitchell Park. Rocky outcrops are also located along the perimeter of the park.

The intertidal zone of Glades Bay is a mud flat exposed at low tide. The land-sea interface at Bill Mitchell Park is a sea wall that slopes at about a 45 degree angle. The rest of the foreshore along the intertidal zone includes rocky platforms.

Glades Bay is an area of bushland on the shores of the Parramatta River. The land is undulating but generally slopes down towards the Parramatta River. There is an existing informal track through dense bushland in Glades Bay Park. The track passes through areas of mangrove and saltmarsh along the foreshore.

The 1:100,000 geological map of Sydney indicates that the site is generally underlain by Hawkesbury Sandstone with areas of Quaternary age alluvial sands and clays present within the foreshore bay areas and fill comprising dredged estuarine sand and mud underlying the southern portion of Bill Mitchell Park. In general, the subsurface conditions encountered at the investigation locations consisted of a limited thickness of fill and/or natural soils with sandstone bedrock encountered at shallow depth. Geotechnical investigations have been undertaken for the proposed works at various locations of the park (Figure 6-1 and 6-2) and (JK Geotechnics 2012). Results are summarised below in Table 6-1.

Table 6-1 Results of geotechnical investigations from JK Geotechnics (2012).

Borehole	Description
1	Fill composed of silty sand up to 0.2 metres deep (refusal at 0.2 metres).
3	Fill composed of silty sand up to 0.5 metres deep Fill composed of gravelly silty sand from 0.5 to 1.5 metres deep Fill composed of silty clay up from 1.5 to 2.5 metres deep Sandy silty clay from 2.5 to 3 metres deep.
4	Fill composed of silty sand up to 0.2 metres deep Sandy clay from 0.2 to 0.4 metres deep (refusal at 0.4 metres).
5	Fill composed of silty sand up to 0.3 metres deep Fill composed of gravelly silty sand from 0.3 to 0.75 metres deep (refusal at 0.75 metres).
6	Silty sandy clay up to 0.3 metres deep (refusal at 0.3 metres).
8	Silty clayey sand up to 1.1 metres deep

Borehole	Description
10	Silty clayey sand up to 0.6 metres deep
11	Fill composed of silty sand up to 0.2 metres deep (refusal at 0.2 metres)
12	Fill composed of silty sand up to 0.2 metres deep (refusal at 0.2 metres)
13	Fill composed of silty sand up to 0.3 metres deep (refusal at 0.2 metres)

Figure 6-1: Location of boreholes at Bill Mitchell Park for geotechnical investigations (JK Geotechnics 2012).

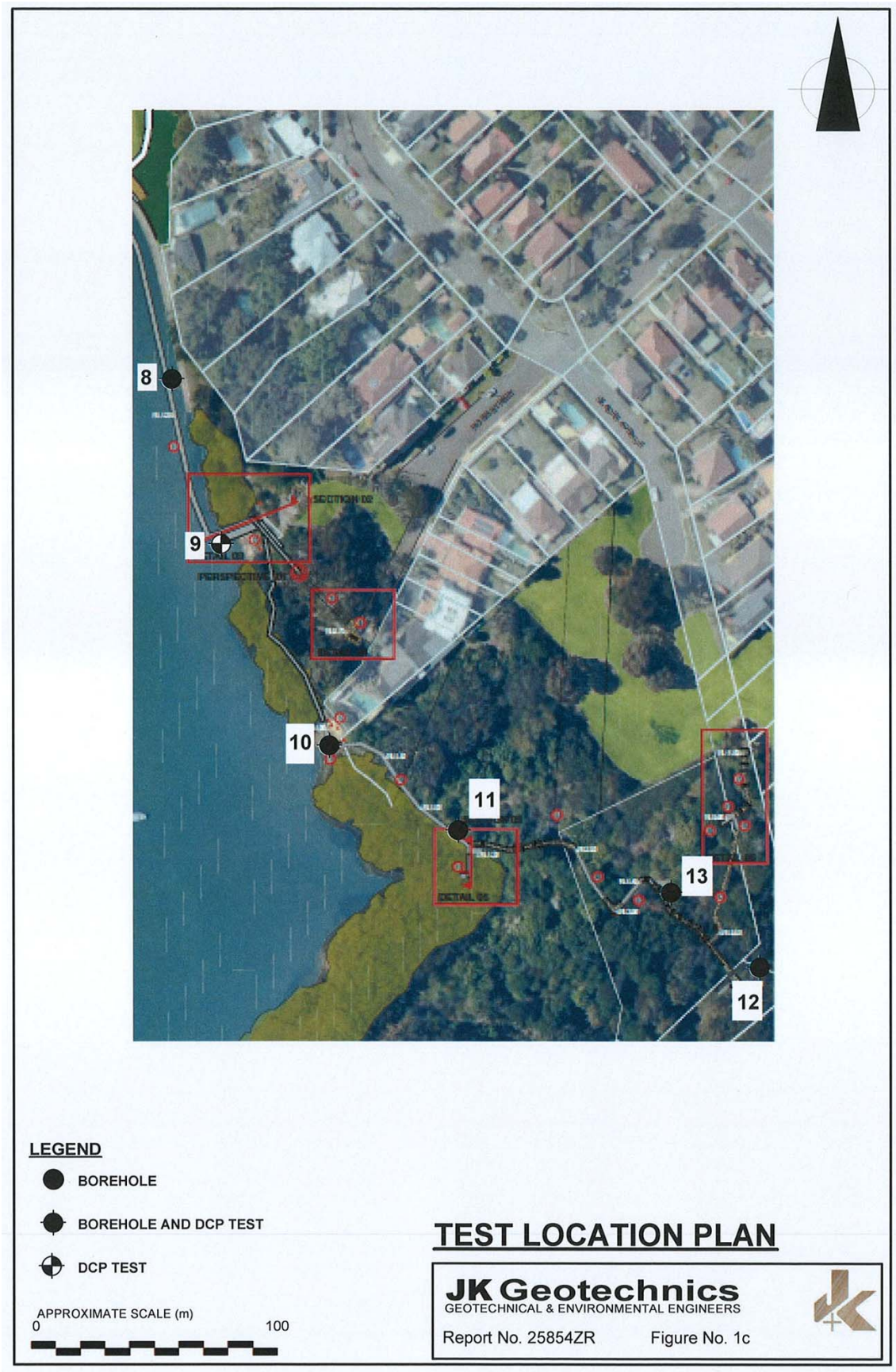


Figure 6-2: Location of boreholes at Glades Bay Park for geotechnical investigations (JK Geotechnics 2012)

Acid Sulphate Soils (ASS)

There is a potential for occurrence of ASS within Bill Mitchell Park, Glades Bay and Glades Bay Park.. Results from soil testing undertaken at the site determined the risk of generating ASS conditions following disturbance of the fill/natural soils at the site is considered to be high (EIS 2012).

Figure 6-3 Probability of occurrence of Acid Sulphate soils. Red – High probability; Yellow – Low probability (ASRIS 2012).

Contamination

EIS (2012) provides a report on the contamination of Bill Mitchell Park and Glades Bay Park. Results are summarised below.

Large sections of Bill Mitchell Park were reclaimed between 1930 and 1943. The park was progressively developed after this time to include a playing filed and walkways. Glades Bay Park was generally occupied by bushland and dense vegetation since at least 1930. The north section of Glass Bay Park was cleared between 1961 and 1972. The sites have generally remained unchanged since at least 1980. There are no EPA contamination notices for the site.

EIS (2012) analysed the soils for various contaminants and the resulting values were assessed against National Environmental Protection Measure (1999) and the Site Auditor Guidelines (2006) to determine the potential risk to the environment and/or health. Results indicated the following:

- Heavy metal concentrations were below the site assessment criteria. Some samples had elevated concentrations of zinc above the phytotoxicity criteria levels.
- Total petroleum hydrocarbons and monocyclic aromatic hydrocarbons were below the site assessment criteria.
- Polycyclic aromatic hydrocarbons and Benzo(a)pyrene were below the site assessment criteria.

- Organochlorine pesticides and organophosphorus pesticides were below the site assessment criteria.
- Polychlorinated biphenyls were below the site assessment criteria.
- Chrysotile and amosite asbestos was encountered in fill samples. However, respirable fibres were not encountered in any of the samples analysed for this investigation.

The data indicates that the contamination is confined to the top soil profile.

Water Quality

Glades Bay is part of the Parramatta River estuary. A creek runs from east to west through Glades Bay Park and discharges into the bay. Existing water quality data was compiled for physical, chemical and biological water quality parameters. In general it was found that the water quality within the estuary was poor with only limited areas of the Parramatta River Estuary considered suitable for secondary contact. Human activities have resulted in elevated levels of nutrients and gross pollutants entering the estuary. Sediment contamination due to urbanisation and industrialisation of the catchment has also had an impact on water quality within the estuary. Extensive alteration of the estuarine foreshore has limited tidal flushing in some areas, further reducing the water quality.

Glades Bay, like many areas along built up areas of Parramatta River, is impacted by stormwater runoff from the urbanised catchment. Stormwater outlets are located along the foreshore of the bay (Figure 6-4).

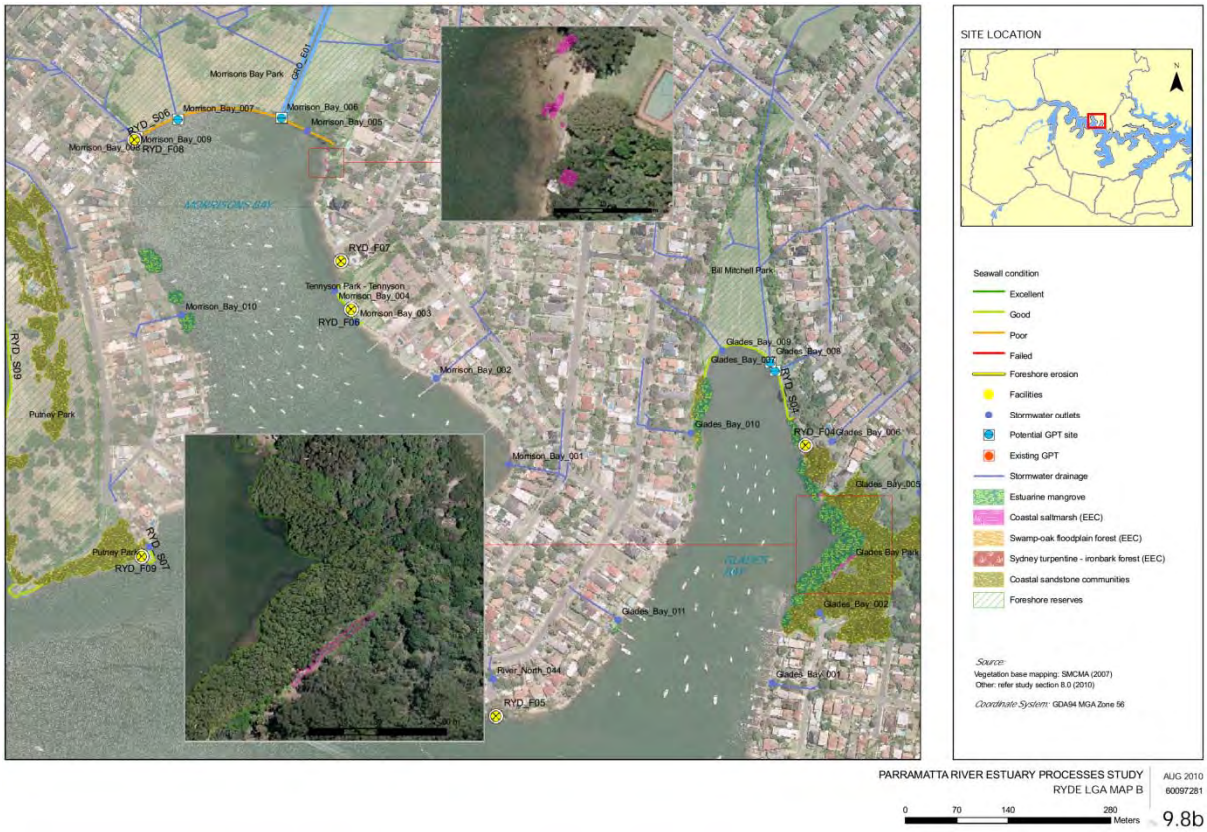


Figure 6-4 Location of stormwater outlets and other environmental aspects at Glades Bay (Aecom 2010).

6.1.2 Potential impacts

There would be no change to the topography of the area. The proposed path in Bill Mitchell Park would be at grade and replacing an existing path. The boardwalk is being constructed to protect the existing foreshore and mangrove vegetation. The path in Glades Bay Park would formalise existing informal tracks and not alter the topography.

The proposal has the potential to impact the water quality within Glades Bay during construction only (and subsequently Parramatta River and Sydney Harbour). However the overall risk, from a qualitative assessment of the impacts, is considered moderate. These impacts, and the sources of pollution, are as follows.

- Contaminated stormwater runoff arising from exposed soils during excavation for the proposed paths and car park which could lead to erosion and subsequent sedimentation. Due to the topography of the proposal site, stormwater runoff would end up in creeks and Glades Bay.
- Chemical/fuel spills directly into the river from the piling rig, the barge and other construction plant.
- Increase in total suspended solid levels, through disturbance of sediments in the bay, in the vicinity of the piles due to the barge movements in the shallow water and during piling.

There is the potential for Glades Bay to contain ASS at the proposed location of the boardwalk. The installation of the piles has the potential to disturb ASS and cause local impacts to water quality by lowering the pH. However, given that any ASS and PASS disturbed during the piling activity would have short contact time with the dissolved oxygen in the water and minimal exposure to air during piling, the potential risk of impacts on the water quality would be minimal. The piles would be driven which would further minimise potential exposure of ASS. The material from the hollow driven piles would be removed from site and disposed of accordingly.

Disturbance of soils may disturb contaminants including asbestos. This has the potential to impact the environment and the general public. Health risks are discussed in section 6.8 and management of waste is discussed in section 6.11.

As groundwater seepage was not encountered during geotechnical drilling the risk of contamination impacting the groundwater is relatively low.

6.1.3 Safeguards and mitigation measures

- An Erosion and Sedimentation Control Plan (ESCP) would be prepared as part of the Construction Environmental Management Plan (CEMP) for the proposal prior to the commencement of construction. The ESCP would incorporate specifications outlined in the NSW Soils and Construction – Managing Urban Stormwater Volume 1 “the Blue Book”(Landcom, 2004). Controls would need to avoid any potential impacts to Looking Glass Bay and the creek.
- The CEMP including the ESCP would be reviewed by Council prior to implementation.
- Environmental Work Method Statements (EWMS) would be prepared for high risk activities such as the boardwalk over water. The EWMS would include:
    - Description of works/activities including machinery
    - Outline of the sequence of the works/activities.

  - Identification of environmental impacts due to works/activities.
  - An environmental risk assessment to determine potential risks to discrete work elements or activities likely to affect the environment or residents.
  - A map indicating the locations of sensitive areas.
  - Evaluation of methods to reduce environmental risks.
  - Mitigation measures to reduce environmental risks.
  - A process for assessing the performance of the implemented mitigation measures.
  - A process for resolving environmental issues and conflicts.
  - Emergency procedures for chemical spills and other potential emergency incidents.

- The EWMS would be forwarded by the Project Manager to the Council's environmental officer for review and approval prior to commencement of works.
- A procedure would be prepared to manage ASS in accordance with the ASS Manual (Stone et al 1998) prior to construction.
- An incident emergency spill plan would be developed and incorporated into the CEMP. The plan would include measures to avoid spillages of fuels, chemicals, and fluids onto any surfaces or into Glades Bay or the creek and an emergency response plan. An emergency spill kit would be kept onsite at all times.
- In the event of an incident the OEH would be notified of any incidents resulting in environmental harm as per Part 5.7 of the *Protection of the Environment Operations Act 1997*.
- All staff would be inducted into the incident emergency spill procedures and made aware of the location of emergency spill kits.
- Should a spill occur during construction, the incident emergency spill plan would be implemented, and Council's Environmental Officer would be contacted.
- All fuels, chemicals, and liquids would be stored at least 40 metres away from any waterways or drainage lines and would be stored in an impervious bunded area within the compound site. Where chemicals, and liquids need to be stored on the barge these would be stored in an impervious bund. The volume of the bunded area would be at least 110% of the volume of the largest tank or 25% of the total stored product, if small containers are used (whichever volume is greater).
- The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas off site.
- Any material transported onto pavement surfaces would be swept and removed at the end of each working day.
- Access to waterways using barges/boats or similar is to be via an existing boat ramp with no disturbance to the bank or surrounding vegetation.

6.2 HYDROLOGY

6.2.1 Existing environment

Stormwater outlets are located along the foreshore of Glades Bay including in close proximity to the proposal site near the sea wall of Bill Mitchell Park (Figure 6-4).

The proposal site in Glades Bay is an estuarine intertidal zone which becomes a mudflat at low tide. Glades Bay Park generally slopes down towards the Bay from east to west and includes a small creek which flows into Glades Bay.

6.2.2 Potential impacts

A boardwalk over water is proposed along the eastern seawall in Glades Bay near Bill Mitchell Park. The limited size of the boardwalk and piling would minimise any potential hydrological impacts. The detailed design would need to consider sea level rise scenarios to ensure adequate freeboard is provided in relation to life time of proposed boardwalk.

Construction activities would be undertaken in close proximity to stormwater outlets, especially the one located along the seawall at Bill Mitchell Park. The outlet may be partially obstructed if care is not taken, especially during the use of the barge in this area, which could cause impacts such as localised flooding in a rain event and scour at the outlet.

The proposed bridges over the creek in Glades Bay Park would span the creek and there would be no piling within the waterway. These methods would minimise impacts to the hydrological function of the area.

6.2.3 Safeguards and mitigation measures

- Sea level rise would be considered in the detailed design of the boardwalk in accordance with the NSW Coastal Planning Guideline: Adapting to sea level rise (DoP 2010).
- The stormwater outlets would not be blocked during construction or operation.

6.3 BIODIVERSITY

6.3.1 Existing environment

The following provides a description of the biodiversity within Bill Mitchell Park and Glades Bay Park using available literature, database searches and site surveys undertaken in December 2011 by **ngh**environmental ecologists. A list of species recorded within the parks is provided in Appendix D.

Vegetation

Bill Mitchell Park is a landscaped area under intensive management. The park is used for recreational activities. The edge of the park contains rocky outcrops and is disturbed with weed growth. Isolated or small groups of trees are also located along the periphery of the park.

The eastern foreshore of Glades Bay includes dense Grey Mangrove stands (protected under the FM Act) as well as isolated areas of coastal saltmarsh (an endangered ecological community under the TSC Act) on the landward side of the mangroves (Figure 6-5). The saltmarsh along the proposal site includes the following species:

- *Sarcocornia quinqueflora*
- *Suaeda australis*
- *Juncus kraussii*

Other areas containing saltmarsh are located away from the proposed path and include species such as *Tetragonia tetragonoides, Alternanthera denticulate, Sarcocornia quinqueflora, Suaeda australis, Lobelia alata, Samolus repens, Baumea juncea, Isolepis cernua, Juncus kraussii, Triglochin striata, Sporobolis virginicus* (Biosphere Environmental consultants 2008).

The saltmarsh is currently experiencing trampling as a result of pedestrian traffic, litter and weed incursions.

No seagrass was recorded in Glades Bay at the proposal site.

Glades Bay Park is partially landscaped, in the northern section of the park, but also contains dense remnant bushland on the sandstone outcrops. This vegetation has been described as a coastal sandstone gully forest. Typical species occurring along the foreshore slopes of the park include *Eucalyptus pilularis, Angophora costata* and *A. floribunda* with an understorey of *Acacia implexa, Banksia integrifolia, Elaeocarpus reticulates, Breynia ablongifolia, Ozothamnus diosmifolius, Dodonaea triqutra* and *Lomandra longifolia.* Typical species occurring further up the park include *Eucalyptus pilularis* and *Ficus rubiginosa* with a lower canopy of *Glochidion ferdinandi* and *Banksia integrifolia* (Biosphere Environmental consultants 2008, Godden Mackay Logan 2009). The vegetation is also disturbed by weeds and access (signs of informal paths created from continuous trampling were recorded).

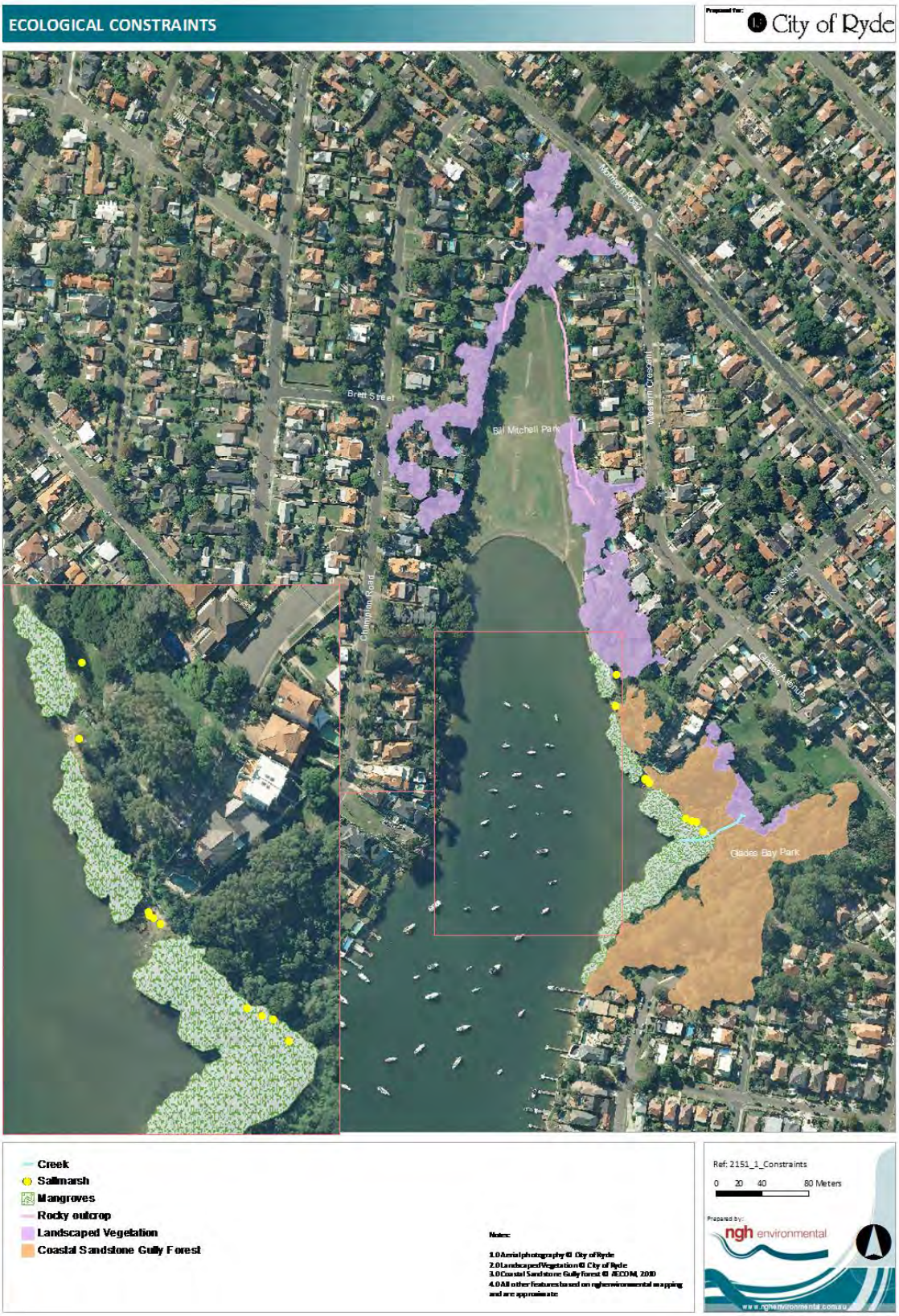


Figure 6-5 Vegetation communities and other ecological constraints in the area of Bill Mitchell Park and Glades Bay Park

Threatened flora species and communities

A search of the NSW Bionet Atlas undertaken on 28 October 2012 for the Ryde LGA and revealed 52 threatened species and 19 threatened communities previously recorded within the LGA (Appendix C). There were no records within two kilometres of the park.

A search of the EPBC protected matters search tool undertaken on 22 November 2012 for a search radius of two kilometres around the proposal site revealed 8 threatened species with the potential to occur (Appendix C).

No threatened flora species were recorded or previously recorded within the parks or foreshore.

Fauna

The park provides various habitat types which reflect the various vegetation types described and mapped above:

- Grassed areas within Bill Mitchell Park and the north of Glades Bay Park.
- Rocky outcrops are located along the periphery of Bill Mitchell Park and within Glades Bay Park which provide some habitat for reptiles and invertebrates.
- Dense vegetation including ground cover, a mid-storey and upper storey (coastal sandstone gully forest) is present in Glades Bay Park. No hollow bearing trees were recorded along the proposed paths.
- Aquatic habitat is present and includes:
    - A small rocky creek with dense riparian vegetation on both banks running through Glades Bay Park. No fish were recoded within the creek (Biosphere Environmental consultants 2008).
    - Intertidal estuarine habitat composed of a mudflat with mangroves and saltmarsh and rocky platforms.

Although the park is located in a highly developed urban setting it does provide some fauna habitat, including foraging habitat, nesting habitat (in the denser portion of Glades Bay Park, and would serve as a movement corridor. Biosphere Environmental consultants 2008 undertook a series of fauna surveys within Glades Bay Park in March, April and September 2008 that included hair tube analysis, searches for animal tracks, burrows, diggings, feathers, scats, spot lighting, anabat analysis, call playbacks, visual surveys and fish netting. Their surveys recorded 43 species including one common frog species, four reptiles, 30 bird species and 6 mammal species. Only one threatened fauna species was recorded, the grey-headed flying fox. Seven species were introduced species. Refer to Appendix D for a species list

Threatened fauna species

A search of the NSW Bionet Atlas undertaken on 28 October 2012 for the Ryde LGA revealed 66 threatened species previously recorded within the LGA (Appendix C). There were no records within two kilometres of the park.

A search of the EPBC protected matters search tool undertaken on 22 November 2012 for a search radius of two kilometres around the proposal site revealed 24 threatened species with the potential to occur (Appendix C).

The only terrestrial threatened species previously recorded within the park was the grey-headed flying fox.

No threatened aquatic species are likely to use the proposal site due to location in a disturbed intertidal area and lack of habitat.

6.3.2 Potential impacts

Construction

The proposal would not require the removal of any large trees. Some trimming of trees may be required to improve access for construction but also for improving access along the paths once they have been built. This may include the requirement to trim mangroves. Impacts would be minor.

The construction would disturb vegetation in Glades Bay Park to formalise the paths. A 1.8 metre wide corridor would be required to allow small vehicles such as Bobcats to construct the path. The construction plant would use existing paths to minimise disturbance of vegetation. Nonetheless, the construction plant would need to be able to manoeuvre in some sections which may increase the disturbance zone to one metre either side of the access tracks. The use of small and manoeuvrable construction plant within the parks would minimise potential risks of directly impacting trees through collisions.

Excavation would be required for profiling the paths and for the raised boardwalks along the foreshore and bushland. This has the potential to impact on the root zones of some trees located along the proposed paths.

The intertidal area between Bill Mitchell Park and Glades Bay Park contains some sensitive communities and/or species including mangroves and saltmarsh, protected under the FM Act. The coastal saltmarsh is also listed as a threatened ecological community under the TSC Act. Construction activities would be required in this area to construct the raised boardwalk. Activities would require the use of a barge as well as small construction plant such as All Terrain Vehicles (ATVs). Workers would also need to access the area. Movement of people and machinery has the potential to directly impact flora and fauna and its habitat, through trampling and accidental injury to vegetation with machinery. Mangroves may need to be trimmed for access purposes, especially in the area of the proposed viewing platform at the southern end of the boardwalk near the entrance to Glades Bay Park. The small patches of saltmarsh as well as the pneumatophores of mangroves could also be trampled or smothered, especially during piling activities for the boardwalk. The barge would also need to be anchored or rested on the bed on the mudflat during works which could impact mangroves, especially through suffocation of pneumatophores, the above ground root system used to supply oxygen to the plants. These areas would be designated no-go areas to avoid impacts.

There is a potential for the spread of weeds during construction activities should construction plant move from weed infested areas to a non infested area. However this risk as low as there are few non infested areas in the park with weeds being common in the majority of the parklands.

Operation

Currently walkers are establishing new informal paths through the park and trampling vegetation and causing localised erosion and further weed incursion into the park. A formal path through the park would keep most of the walkers on one path, reducing further impacts on the bushland.

The proposed concrete/sandstone paths would be within the root zone of some of the larger trees within the park. Impacts to the long term survival of the trees are, however, unlikely considering the limited

width of the paths, which follow existing dirt tracks. The small piles required for the raised boardwalk section of the path are also unlikely to have major impacts to the root zone of any tree.

A carpark would be created at the northern end of Bill Mitchell Park and the currently grassed area would be asphalted. This has the potential to impact nearby trees through impacts to tree root zones. The exact scale of the impact is uncertain as the design of the carpark is still underway. The design would progress with input from an arborist to ensure that few if any trees are affected by the carpark.

No vegetation would be removed in Bill Mitchell Park. Native trees including *Eucalyptus botrioydens* and *Glochidion ferdinandi* and native undergrowth would be planted in the south eastern and south western corners of the park. Non-native trees would be planted along the car park and access path at the north of Bill Mitchell Park, and at the access paths from Brett Street and Western Crescent. The planting of trees and native undergrowth, in Bill Mitchell Park in particular, would provide some additional habitat for birds and other common fauna species.

Once completed the proposed boardwalk is likely to improve the condition of the saltmarsh as it will avoid this community and minimise any potential trampling due to current unrestricted pedestrian access. The raised boardwalk is also unlikely to impact tidal inundation of the saltmarsh.

A 7 part test assessment of significance has been undertaken (Appendix E) to determine impacts on the saltmarsh community. The results indicate that impacts are unlikely to be significant taking into account the safeguards outlined in section 6.3.3. No other threatened species are likely to be impacted by the proposed works.

Impacts to flora and fauna as a result of erosion and sedimentation and other water quality impacts may also arise during construction. The highest potential for this to occur is along the foreshore and intertidal area and where works are being undertaken near the creek of Glades Bay Park. These potential impacts have been discussed in section 6.1 and appropriate safeguards

6.3.3 Safeguards and mitigation measures

- The boardwalk would avoid the mangrove stands including the areas of pneumatophores as much as possible.
- The boardwalk including the viewing platform along the southern section of boardwalk (near the southern entrance to Glades Bay Park) would be designed to minimise any potential impacts to the mangroves and avoid any impacts to the saltmarsh.
- Construction workers would be made aware of the sensitive nature of the environment prior to construction, in particular the importance to avoid and/or minimise impacts to mangroves and saltmarsh.
- The CEMP would include a map showing the location of the ecological constraints on site. No go-zones would be clearly indicated on maps and would include:
    - The saltmarsh
    - Mangroves stands where construction is not required
    - The dense bushland vegetation within Glades Bay Park
- No new access tracks for construction purposes would be created. Construction plant would use existing tracks and avoid or minimise any potential disturbance to the surrounding bushland.

Dedicated turning areas for construction plant would be selected in areas that would cause the least disturbance (ie cleared grassy areas, or areas with minimal native vegetation).

- The design of the paths and car park would ensure that there would be no impacts to the long term health and stability of any trees. Advice from a qualified arborist would be sought during the detailed design.
- No excavation that would alter the flow/tides within the intertidal zones would be allowed.
- No mangroves would be removed as part of the works. Only trimming would be allowed under a permit from DPI (Fisheries).
- A permit under Part 7 of the Fisheries Management Act would be required for potential harm to marine vegetation (mangroves and saltmarsh).
- Educational signage on estuarine habitats (saltmarsh and mangroves) should be provided.
- Approval from Roads and Maritime Services (Maritime Division) would be required for works below the mean high tide mark. As such a permit under the FM Act for dredging and reclamation would not be required and instead DPI (Fisheries) would be notified of proposed dredging and reclamation works in accordance with clause 199 of the FM Act.
- The barge would avoid and not anchor or rest within areas of mangroves and their pneumatophores.

6.4 NOISE AND VIBRATION

6.4.1 Policies

The Interim Construction Noise Guidelines (ICNG) (DECCW 2009) provides guidance on assessing construction noise impacts. In accordance with the ICNG, a quantitative noise assessment is required when construction activities would impact sensitive noise receivers for more than three weeks. While the duration of the proposed is not known at this stage, and is likely to be undertaken in stages, each stage is likely to be over three weeks.

6.4.2 Existing environment

Bill Mitchell Park is surrounded by residential properties which border the park. Background noise readings (RBL) were undertaken on 27 September 2012 at the boundary of a sensitive receiver located about 10 metres from the proposed works in the south east corner of Bill Mitchell Park. The RBL during day time was 41 dB(A) ($LA90_{(15min)}$). Noise sources in the area include local road traffic which would be low.

Figure 6-6 Sensitive noise receivers surrounding Bill Mitchell Park and Glades Bay Park. Red: residential; Green: passive recreation areas. Star indicates location of background noise monitoring (Source Google Earth)

In accordance with the ICNG, the construction noise management levels ($LAeq_{(15min)}$) would be:

- Residential properties: 51 dB(A)
- Passive recreation area: 60 dB(A)

Where construction noise levels are above these levels, sensitive receivers would be considered noise impacted (or highly noise impacted if construction noise is higher than 75dBA).

Sensitive receivers to vibration include nearby residences and other infrastructure such as the seawall along Bill Mitchell Park.

6.4.3 Potential impacts

Table 6-2 provides an assessment of the various construction plant that would be used and the noise they would generate at the nearest sensitive receiver (within 10 metres) of the proposed works. The results provide an indication of the potential construction noise impacts and show that surrounding residents are likely to be noise affected or highly noise affected during construction.

Table 6-2 Construction plant noise assessment. The noise assessment only takes into account distance of sensitive noise receiver from noise source without taking into account any potential noise barriers present.

Construction plant	Noise at source (Sound Power Level Leq dB(A))	Noise at 10 metres (closest sensitive receiver) (Leq dB(A))
Light vehicles (4 wheel drive)	103	75
Trucks	108	80
Piling rig (driven)	115	87
Bobcat T250 loader	101	73

Construction plant	Noise at source (Sound Power Level Leq dB(A))	Noise at 10 metres (closest sensitive receiver) (Leq dB(A))
Bobcat E35 excavator	101	73
Argo 6x6 Frontier 580 vehicle (All Terrain Vehicle)	95	67
Small concrete truck	109	81
Powered hand tools	109	81

It should be noted that:

- Construction activities would be temporary.
- Construction activities would be undertaken during day time, therefore there would be no sleep disturbance.
- A single receiver would not be impacted for the full duration of the construction period as the works would move away from a single receiver as the works progress.
- The piling rig, the loudest construction plant, would only be used for the boardwalk over water and would only be used for a short duration.

Management measures have been recommended in section 6.4.4 to minimise potential construction noise impacts.

Vibration impacts on nearby residences and to the seawall, have the potential to occur during earthworks and pile driving for the proposed boardwalk over water. The seawall lining the southern end of Bill Mitchell Park is in variable condition and the poorly compacted fill is expected to extend to the rear of the seawall. The use of rollers and/or wacker packers may also create vibrations.

When dealing with construction vibration, the effects on buildings can be divided into three main categories:

- Those in which the occupants or users of the building are inconvenienced or possibly disturbed.
- Those where the building contents may be affected.
- Those in which the integrity of the building or the structure itself may be prejudiced.

Human Comfort

OEH's '*Assessing Vibration; a technical guideline*', published in February 2006 provides criteria for vibration sources which are continuous, impulsive or intermittent. Preferred and maximum values for continuous and impulsive vibration are defined in the guideline. The piling works are not anticipated to have any adverse impact on human comfort.

Structural Damage to Buildings

There is currently no Australian Standard for assessment of building damage caused by vibrational energy. However, according to related international standards, the minimum 'safe limit' of vibration at low frequencies for commercial and industrial buildings is 20mm/s. For dwellings it is 5mm/s and for particularly sensitive structures (eg historical with preservation orders etc), it is 3mm/s. Pile driving can have vibration impacts of 1 to 3mm/second at distances of 25 to 50m depending on soil conditions.

Operational noise impacts are not anticipated as a result of the proposed works.

6.4.4 Safeguards and mitigation measures

- Works would only be carried out during standard working hours (i.e 7am–6pm Monday to Friday, 8am–1pm Saturdays).
- Measures would be developed in accordance with the interim construction noise guidelines (DECCW 2009) and form part of the CEMP to manage potential construction noise once final construction methodology is known.
- Regular updates on the proposal would be provided to the community.
- A community liaison phone number and site contact would be provided so that noise and or vibration-related complaints if any can be received and addressed in a timely manner.
- Once final construction methodologies are known, vibration emission levels from each plant, in particular the piling rig, rollers and wacker packers, would be assessed prior to the commencement of construction works and the potential impacts of vibration on nearby residences and the sea wall would be determined. Safe buffer distances and other feasible measures (choice of plant) would be determined to avoid structural damage to sensitive receivers, in particular the seawall.
- Sudden stop/start movements of tracked equipment should be avoided in proximity to the seawall at Bill Mitchell Park in order to reduce transmission of potentially damaging ground vibrations to the seawall. Construction plant work within a zone defined by a line off-set a lateral distance of 3m from the crest of the seawall should be avoided. This zone should be clearly marked out on site.

6.5 AIR QUALITY

6.5.1 Existing environment

Residential properties are located around the perimeter of the park and within 10 metres of proposed works.

6.5.2 Potential impacts

Very minor and localised impacts to air quality may occur due to exhaust fumes from construction plant and vehicles. Minor earthworks would also be required which may cause dust, especially during windy conditions.

6.5.3 Safeguards and mitigation measures

- Plant and machinery would be maintained in accordance with manufacturer's specification.
- Smoky emissions will be kept within the standards and regulations under the Protection of the Environment Operations Act 1997 (PoEO Act) that no vehicle shall have continuous smoky emissions for more than 10 seconds.
- Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust.
- Stockpiles or areas that may generate dust are to be managed to suppress dust emissions.
- Vegetation or other materials are not to be burnt on site.

- Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.

6.6 TRAFFIC AND ACCESS

6.6.1 Existing environment

Pedestrian access to Bill Mitchell Park is from Brett Street, Morrison Road and Western Crescent. Maintenance vehicles can access the park from Morrison Road.

There is no formal access from Bill Mitchell Park to the Ross Street Reserve and Glades Bay Park along the foreshore. However, pedestrians are currently using the sea wall and unfenced private property or wait until low tide to use the mud flat to move between Bill Mitchell Park, Ross Street reserve and Glades Bay Park.

Access to the dinghy storage area is possible via tracks from Ross Street. Private moorings are located in Glades Bay. These boats are access by dinghies stored along the foreshore at the end of Ross Street. There is currently no formal facility to facilitate the launching of the dinghies.

Glades Bay Park can also be accessed from York Street, Ashburn Place, Clare Street, Glades Avenue and Delmar Parade. The park includes a series of formal and informal tracks leading to the foreshore.

On street parking is available on the local streets in the area.

A number of residents have rear access (pedestrian access) to Bill Mitchell Park and the foreshore of Glades Bay.

6.6.2 Potential impacts

Construction

Construction plant and machinery would use local roads to access relevant sections of the paths. Roadside parking may be used during this time. It is not anticipated that this would have a major impact on parking during the construction period due to the limited number of vehicles likely to be required.

A piling rig on a barge would be required in Glades Bay in order to construct the boardwalk. This is unlikely to impact waterway traffic as the piling would be undertaken within the intertidal zone along the foreshore and there are no boat ramps or moorings in this area.

Access to sections of Bill Mitchell Park, Glades Bay Park and Ross Street Reserve may be temporarily impeded during the construction period. It is unlikely that the whole of Bill Mitchell Park or Glades Bay Park would be closed for any period of time during construction. However, a number of access impacts may occur at the following locations:

- Brett Street, Morrison Road and Western Crescent entrances to Bill Mitchell Park. These access paths would be impeded during the construction. However, not all accesses would be blocked at the same time which would minimise potential access issues.
- The site around the dinghy storage area may be impacted during construction of the boardwalk and boat launching facility. This has the potential to impact access to boat moored in Glades Bay if an alternative area to launch dinghies cannot be provided.

- The paths, including bridges, in Glades Bay Park would be upgraded. This would require the use of some construction plant which would effectively block access to certain areas of the park during construction.

Residents with access to Bill Mitchell Park and/or the foreshore of Glades Bay may also have these accesses temporarily impacted during the construction of the paths.

Operation

The proposed works would formalise paths through Bill Mitchell Park, Ross Street reserve and Glades Bay Park. This would improve would provide greater access to the Parramatta River foreshore and provide a link to other parks along the foreshore. This would implement the masterplan for the Ryde River Walk.

Accesses to Bill Mitchell Park and/or the foreshore of Glades Bay for residents with direct access to these would be retained.

The paths and boardwalks would keep users on one path which would reduce the occurrence of public access of private property. The boardwalk over water would avoid people using the seawall as an access path to and from Bill Mitchell Park which would improve safety.

A formal boat launching area (ramp) would improve access to Glades Bay for users of the dinghies. The dinghy storage area would remain at its current location and would not be increased in size.

A car park would be constructed at the Morrison Road entrance of Bill Mitchell Park. This would provide parking spaces for users of the park. This would reduce the number of people using local roads for parking. There is also an opportunity to improve disabled access to the park by providing car spaces for the disabled.

6.6.3 Safeguards and mitigation measures

- Driveway accesses would not be impeded at any time during construction.
- Accesses to Bill Mitchell Park and/or the foreshore of Glades Bay for residents with direct access to these would be retained.
- Bill Mitchell Park and Glades Bay Park would remain accessible to the public throughout the construction period. Construction would be staged to ensure that no more than one access point to the park is blocked at any one time.
- Loading of the barge with construction plant and material including piling rig would be undertaken from existing boat ramps in the area.
- Boat owners and residents with foreshore properties would be notified of the timing of any construction works that would impact them.
- The proposed parking at Bill Mitchell Park should include parking spaces for the disabled.

6.7 VISUAL AMENITY

6.7.1 Existing environment

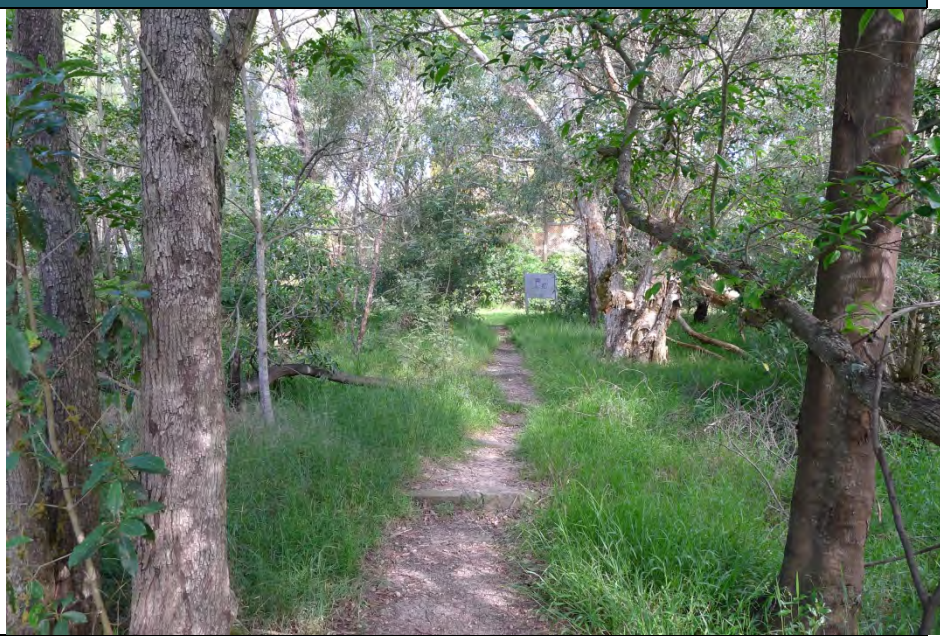
The proposal would be undertaken within Glades Bay, Ross Street reserve, Bill Mitchell Park and Glades Bay Park. The area offers high visual amenity. Residences surrounding Bill Mitchell Park on Brett Street

and Western Crescent have views of the parks and Glades Bay where the proposed boardwalk would be located. Residents on the western side of Glades Bay have a view of the area of the proposed boardwalk and of Glades Bay Park.

Table 6-3 Key viewpoints

Key View point	Visual receivers	Site photograph
Bill Mitchell Park	Park users and surrounding residents	
North end of Bill Mitchell Park (proposed car park)	Park users, road users, residents	

Key View point	Visual receivers	Site photograph
View of south eastern and south western corners of Bill Mitchell Park from residential properties.	Park users, residents surrounding park	
Glades Bay eastern foreshore near Bill Mitchell Park (proposed boardwalk area)	Park users, residents around Glades Bay	

Key View point	Visual receivers	Site photograph
Glades Bay Park	Park users	

6.7.2 Potential impacts

The impact of the proposal on each viewpoint has been assessed and has been based on a composite of the sensitivity of the view and magnitude of the proposal in that view (see for grading values).

	Magnitude						
Sensitivity		High	High to moderate	Moderate	Moderate to Low	Low	Negligible
	High	High Impact	High Impact	Moderate-High	Moderate-High	Moderate	Negligible
	High to moderate	High Impact	Moderate-High	Moderate-High	Moderate	Moderate	Negligible
	Moderate	Moderate-High	Moderate-High	Moderate	Moderate	Moderate-Low	Negligible
	Moderate to Low	Moderate-High	Moderate	Moderate	Moderate-Low	Moderate-Low	Negligible
	Low	Moderate	Moderate	Moderate-Low	Moderate-Low	Low Impact	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Visual sensitivity refers to the quality of the view and how sensitive it is to the proposed change. Visual sensitivity is related to the direction of view and the composition of the view. Magnitude refers to the nature of the proposal and its proximity to the viewer. Table 6-4 provides an assessment of the visual impacts of the proposal.

Table 6-4 Visual impact assessment

Viewpoint	Impact of proposal	Visual sensitivity	Magnitude	Overall impact	Comment
Bill Mitchell Park	New concrete and sandstone paths, park benches and vegetation.	Low	Low	Low	There is an existing concrete path in the park. The proposal would involve upgrading the existing paths, installing bench seats and some landscaping. This is unlikely to have adverse visual impacts.
North end of Bill Mitchell Park (proposed car park)	Proposed car park	Moderate	Moderate	Moderate	The location of the carpark would be at the entrance of Bill Mitchell Park. Highest impacts would be to adjacent residents as the grassed area would be replaced by asphalt and cars.
View of south eastern and south western corners of Bill Mitchell Park from residential properties.	New boardwalk, paths, park benches and vegetation including trees.	Moderate	Potentially high	High	The new path and boardwalk would meet very close to the rear of foreshore properties at the south eastern end of Bill Mitchell Park. There would also be bench seat and landscaping. Some water views may be obstructed with by the proposed trees to be planted. Though the trees would need to be of a sufficient height as the residential properties are located at a higher level than Bill Mitchell Park.
Glades Bay eastern foreshore (proposed boardwalk area)	Construction of a boardwalk and boat launching area.	Moderate	Moderate	Moderate	The boardwalk and boat launching area would mainly be visible by Bill Mitchell Park users and residents located on the western side of Glades Bay and bill Mitchell

Viewpoint	Impact of proposal	Visual sensitivity	Magnitude	Overall impact	Comment
					Park. Boardwalks are common features in wetlands in urban areas. The nature of the site where all visual receivers have views to constructed structures would minimise potential visual impacts.
Glades Bay Park	Formalisation of existing dirt tracks using boardwalks and crushed sandstone.	Moderate-low	Low	Moderate low	The proposal would formalise existing tracks in an urban park. Viewers would only include park users as the tracks would not generally be visible from residential properties due to dense vegetation.

There is potential for the works to have some visual impacts on residents near the foreshore in the south eastern and south western corners of Bill Mitchell Park. Current water views for residents in these areas may be partially obstructed by the planting of *Eucalyptus botryoides* and *Glochidion ferdinandi* trees if these grow to a sufficient height.

The views of residents on the western side of Glades Bay would also be impacted by the construction of the boardwalk. The current views of the foreshore with mangroves would be replaced with a view of the proposed boardwalk and boardwalk users against the existing mangroves. However, given the urban nature of the surrounding environment and the use of boardwalks in other localities in the area, a boardwalk in this area is considered an acceptable use and its visual impacts are balanced by the benfits to park users and the environment.

The proposal may result in some reduced privacy for foreshore residents in Bill Mitchell Park due to the increase in accessibility and provision of bench seating at the south eastern and south western corners of the park. However, this reduced privacy through increased accessibility would be compensated by the fact the boardwalk would take walkers away from private properties by directing them in front of the mangroves.

6.7.3 Safeguards and mitigation measures

- Landscaping in the south western and south eastern corner would be considered to ensure water views for local residents are not obstructed.
- Detailed design would consider the use of boardwalk materials that minimises potential visual impacts (e.g. no use of bright colours).

6.8 SOCIO-ECONOMIC IMPACTS

6.8.1 Existing environment

There is existing access to the foreshore at Bill Mitchell Park, at the boat launching area and via informal walking tracks in Glades Bay Park. However, there is no link between the boat launching area and Bill Mitchell Park. Walkers use the sea wall to walk between Bill Mitchell Park and the boat launch area.

6.8.2 Potential impacts

The proposed works would impact the local community through:

- Visual impacts (Section 6.7)
- Construction noise (Section 6.4)
- Traffic and access (Section 6.6)

Earthworks have the potential to accidentally damage underground services and cause disruptions to local residents.

Contaminants including asbestos have been found in certain soil samples (section 6.1). EIS (2012) has assessed the risk to human health from the proposed works as low. Direct contact with contaminated soil can lead to dermal absorption or accidental ingestion. The risk is highest during construction as soils are disturbed from excavation. Construction workers would be more at risk compared to the general public as the general public would not be able to access the construction site. Once the path has been constructed, exposure to the underlying fill would be avoided. While asbestos was encountered, respirable asbestos fibres were not encountered and therefore the risk of inhalation is low.

The proposal would improve the park amenities and access for various users, including cyclists and the disabled. It is not anticipated that these improved amenities would have a substantial impact on the number of people that would use the park as no new facilities that have the potential to attract new users from the wider locality or region would be constructed.

The proposal would not use private land.

The proposed path would be designed and constructed to minimise any maintenance which would reduce costs over time.

6.8.3 Safeguards and mitigation measures

- Local residents would be advised of the proposed works at least two weeks prior to construction commencing through a letter box drop.
- Appropriate signage would be placed at the entrances to the park to advise users of proposed works prior to start of construction.
- Dial before you dig would be undertaken to determine locations of all underground utilities prior to detailed design and construction. The design and construction of the proposed river walk should avoid impacts to utilities.

6.9 ABORIGINAL HERITAGE

An *Aboriginal & European Archaeological Heritage Impact Assessment Statement* (AHIS) was prepared for the proposal by Dominic Steele Consulting Archaeology (2012). The following provides a summary of the report provide in Appendix E.

The AHIS was prepared in consultation with the Metropolitan Local Aboriginal Land Council (MALC).

6.9.1 Approach

A search of the NSW Office of Environment & Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) Sites Register was undertaken.

A series of inspections of Glades Bay Park and Bill Mitchell Park and their surrounds have been undertaken in preparing the AHIS.

6.9.2 Existing environment

The following Aboriginal cultural heritage sites occur in Bill Mitchell Park, Glades Bay Park and surrounds. The first three are located along the eastern side of Bill Mitchell Park to the north of the sandstone seawall constructed during reclamation works in c.1938 for the creation of this parkland. The fourth site occurs close to the water below the end of Ross Street at the boat launch area. The remaining three sites are located within the bush land of Glades Bay Park further to the south:

- Bill Mitchell Park 1 (AHO Site #216) OEH #45-6-1924 Shelter with Art.
- Bill Mitchell Park 2 (AHO Site #217) OEH #45-6-1927 Shelter with Midden.
- Bill Mitchell Park 3 (AHO Site #218) OEH #45-6-1923 Shelter with Midden.
- Bill Mitchell Park 5 (AHO Site #220) OEH #45-6-1925 Shelter with Midden.
- Glades Bay 1 (AHO Site #222) OEH #45-6-0531 Open Midden.
- Glades Bay 2 (AHO Site #223) OEH #45-6-0609 Rock Engravings.
- Glades Bay 3 (AHO Site #224) OEH #45-6-2321 Grinding Grooves.

Bill Mitchell Park 1 (AHO Site #216)

This small sandstone overhang was first recorded in 1990. The site recording at the time described a faint white hand stencil was present on the rear wall of the shelter. The Aboriginal Heritage Office (AHO) has prepared an updated condition assessment for this site. No archaeological deposit is presently visible on the floor of the overhang, and while there are indications of previous fire-use in the shelter, the hand stencil recorded in 1990 is not currently visible.

The publically accessible context of the site present challenges to its ongoing protection and management.

Bill Mitchell Park 2 (AHO Site #217)

This now modified overhang was also first recorded in 1990. The site recording prepared at that time reported the presence of no art, with the floor deposit including archaeological shell midden with rock oyster and hairy mussel.

Terraced gardens have now overrun the shelter. The sandstone element would have once been longer, but is now reduced to little more than 2m in length. No evidence for shell midden material is presently visible.

Bill Mitchell Park 3 (AHO Site #218)

This modified overhang is the third of the three recorded in 1990 and is also situated along the eastern side of Bill Mitchell Park to the north of the seawall. The site recording prepared at that time indicated it had been already incorporated into a terraced garden feature with midden materials of rock oyster and cockle still visible. Shell midden is still visible, but only in a shelf within the shelter and as minor remnant pieces mixed and broken on the floor of the overhang and in surrounding garden contexts. Recent landscaping and vegetation maintenance has disturbed or removed any pre-existing Aboriginal archaeological deposits outside of where materials are currently visible.

Bill Mitchell Park 5 (AHO Site #220)

This site is situated between at the boat launch area close to the waterline below Ross Street. It was first recorded in 1990. The dingy rack (presumably in the same location from at least 1990) has been established on the surface of now largely grassed over shell midden deposits. Shells also occur in places in exposures beneath the grass and overlying the sandstone shelves in the foreground of this photograph.

An existing dirt track leads to the base of the timber steps leading down from Ross Street. Midden deposits occur on both sides of this track. Shell midden materials are also currently exposed around the base of an interpretive panel near the base of the Ross Street steps, and the adjacent sandstone cliff face.

The nature, location, and context of this Aboriginal heritage site present a number of challenges to its effective protection now and its ongoing management. The site consists of a small modified sandstone overhang that forms a part of a larger rock face that contains remnant archaeological deposits and evidence of fire-blackening from past Aboriginal use, with midden deposits occurring in front of the cliff that extends down towards the waterline. These archaeological materials are presently covered by grass and other foreshore vegetation, but have been disturbed in the past by the placement of the dingy rack, the nearby interpretation panel and Ross Street steps and foot track, and the early twentieth century steps and stone wall at the tide-line of the river foreshore.

These elements of the site occur within a confined space and have a number of physical and public use constraints that pose direct threats to the ongoing preservation of the site. At present, public access to the water and dingy rack in this location are from the Ross Street steps and from Bill Mitchell Park (via the seawall) and Glades Bay Park to the northwest and southeast respectively.

Glades Bay 1 (AHO Site #222)

This open midden is located on the alignment of a current tracking the vicinity of a creek (with a small 'waterfall' feature and a timber crossing nearby) and interpretive sign. The site has been recorded a number of times since 1985. The precise extent of this site is currently unknown.

Glades Bay 2 (AHO Site #223)

This site is a group of rock engravings and was first recorded in 1941. At the time of this recording the group comprised two possums, a man, a large fish, a shield, a mammal, a native water rat, two wallabies, a boomerang and a part of a fish. It is the only group of engravings along the Parramatta River.

A condition assessment by the AHO in 1973 found that only the engravings of two wallabies were visible. The report found that some damage had been done to the engravings. A further condition assessment by the AHO in 2010 recommended that branches overhanging the engravings could be damaging the

engravings and should be removed. The report also suggested that an attempt should be made to locate some of the other engravings recorded in 1941.

Three of the original engravings are now visible and the others are likely to be present but are obscured by vegetation. The wallaby engravings have been re-grooved since 1941 and the engraving of the man has been highlighted recently. The construction of a fence and brass plague in 1947 has disturbed parts of the rock platform. Visitors can gain access to the platform by stepping over the railing of the timber viewing platform and on to the figure of the man.

The axe grinding grooves near the rock engravings have a timber viewing platform. Some of the grooves are obscured by lichen. The education signs are in poor condition here.

Glades Bay 3 (AHO Site #224)

The axe grinding grooves were first recorded in 1991. They currently form part of an existing tract and feature a timber viewing deck and information signs.

The AHO have prepared an updated condition assessment report and description for the site. It includes eight grinding grooves associated with a rock pool, and some of these are shallow and faint. Graffiti recorded in 1991 including engraved initials ('S D') and a small sailing boat is still visible, but no new graffiti and/or other obvious sign of disturbance to the site are apparent.

6.9.3 Potential impacts

Bill Mitchell Park

No direct impacts to the rock overhangs with Aboriginal archaeology importance along the eastern side of the park would occur as a result of the creation of the new walkways. The sandstone formations are set back on the edge of the soccer field, and any potential indirect impacts during future construction activities can be prevented. The AHO and MLALC have provided Council with standard procedures and protocols on how effective site management levels can be established and maintained during works programs undertaken within the vicinity of known Aboriginal heritage sites.

It is expected footpath works in the park would encounter reclamation fill dating to c.1938-1943. It is likely the depths of these fills below current grassed surfaces will be considerable. There is little chance of intact Aboriginal archaeological deposits to be exposed (at least immediately) below ground levels. The proposed new paths would be constructed at current ground level and/or just below it and will extend into underlying fill materials of low archaeological sensitivity to a shallow depth.

The proposed works in the park will also allow for the relocation of existing and/or the placement of park benches and other facilities (such as rubbish bins) away from the immediate vicinity of the sandstone elements that contain Aboriginal archaeology. Repositioning of these to passively discourage visitors from using the rock overhangs as convenient play areas and as garbage disposal points will assist in the ongoing protection of these Aboriginal heritage sites in the park.

Ross Street Reserve

The proposal to create new boardwalk facilities between the Bill Mitchell Park seawall and the Ross Street steps have been designed to mitigate direct impacts to Bill Mitchell Park 5 (AHO Site #220).

However, the construction of a formal path at the proposed boat launch area has the potential to impact Aboriginal archaeological and cultural heritage values. The following construction activities have the potential to have cause impacts:

- The upgrade of the Ross Street steps.
- Formalisation of the existing pedestrian track at the base of the steps which leads to the dingy rack and waterline.
- The creation of a boardwalk from the southern end of the elevated platform over the river to the sandstone steps at the waterline.
- Vegetation clearance in general, and around the sandstone cliff face and overhang in particular for construction access.
- Potential transportation and placement (temporary storage) of construction equipment and material for the proposed boardwalk.

The nature of the potential impacts is unclear at this stage and a site-specific *Heritage Impact Statement* (HIS) would need to be prepared for this area when design and construction options for this component of the proposal are confirmed.

Glades Bay Park foreshore

The precise extent of the open shell midden located on the alignment of the Waluba Track in Glades Bay (Glades Bay 1 - AHO Site #222) is currently unknown. Activities for the creation of a raised boardwalk in this locality have the potential to disturb this archaeological site from future works including:

- Excavation for the installation of supporting piers for the boardwalk.
- Vegetation clearance around future construction/activity areas.
- The replacement/relocation of interpretive signage along the Waluba Track.
- The transportation and storage of construction equipment & materials.

The potential exposure of sandstone surfaces during works may reveal as yet undetected engravings or axe grinding grooves.

A locality specific HIS would need to be prepared when design and construction options for the proposal are confirmed.

Glades Bay Park Aboriginal Rock Engraving & Axe Grinding Groove Sites

A site-specific Heritage Impact Statement (HIS) would need to be prepared for the modification to the existing sandstone and timber access points, and what are elsewhere currently informal tracks, to the south and north of the main engraving site. Future vegetation clearance in these areas may expose sandstone surfaces that have the potential to possess previously unrecorded engravings and axe grinding grooves.

6.9.4 Safeguards and mitigation measures

- All known Aboriginal heritage sites would be identified on a map and included in site inductions to make construction staff aware of the sensitivity of the sites to construction impacts. Where possible all these sites would be considered no go zones.
- Provision of additional heritage signage along the proposed paths in Bill Mitchell Park. The MLALC and AHO have advised on how signs can be placed without specifically pointing out where sensitive heritage sites are located and what kind of messages they should convey to visitors.
- A site-specific Heritage Impact Statement (HIS) would be prepared for the Ross Street Reserve, for the Glades Bay Park foreshore sites and for the Glades Bay Park Aboriginal Rock Engraving & Axe Grinding Groove Sites when design and construction options for these components of the proposal are confirmed. The HIS would be developed in

consultation with the MLALC and would identify adequate levels of heritage site protection and appropriate conservation and management approaches. The HIS would also identify the need for an Aboriginal Heritage Impact Permit (AHIP) to be sought from the OEH to guide future works. Potential heritage management options and actions may include:

- Targeted archaeological test excavation (with an approved OEH AHIP) in planned pier hole locations to establish the presence or absence of midden materials in order to accurately map these occurrences to a level that cannot be achieved by field inspection alone. This would identify where the boardwalk alignment could be created with no foreseeable Aboriginal heritage constraints.
- If any potential heritage items uncovered during the works, works would be stopped and the City of Ryde Environment Representative would be contacted. If the items are likely to be of significance then the Heritage Branch would be contacted.

6.10 NON-ABORIGINAL HERITAGE

An *Aboriginal & European Archaeological Heritage Impact Assessment Statement* (AHIS) was prepared for the proposal by Dominic Steele Consulting Archaeology (2012). The following provides a summary of the report provide in Appendix E.

6.10.1 Approach

Database and available literature were searched and reviewed. The databases searched included:

- NSW Office of Environment & Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) Sites Register.
- NSW Heritage Council – State Heritage Register & State Heritage Inventory.
- Ryde Local Environmental Plan (LEP) 2003 (105), LEP 2010, and Draft LEP 2011 (Schedule 5 – Environmental Heritage, Part 1 – Heritage Items).
- Sydney Regional Environmental Plan 2005 (Sydney Harbour Catchment) Schedule 4.
- Sydney Water Section 170 Heritage & Conservation Register.
- NSW Roads and Maritime Authority Section 170 Heritage & Conservation Register.
- Sydney Harbour Foreshore Authority Section 170 Heritage & Conservation Register.

A series of inspections of Glades Bay Park and Bill Mitchell Park and their surrounds have been undertaken in preparing the AHIS.

6.10.2 Existing environment

There are no listed heritage items in the vicinity of the proposal site.

Three unlisted items at Glades Bay were identified for consideration as potential heritage items. These are:

- Sandstone remains of the Glades Bay Baths (c. 1909)
- The 1930s Bill Mitchell Seawall

- The sandstone entry steps to Bill Mitchell Park.

Glades Bay Baths

The open swimming baths at Glades Bay were built by Council at the bottom of Ross Street in c.1909. There are remains of a set of sandstone steps and a small seawall immediately north of the boat launch area which may be associated with the baths.

Little information has been sourced for the history of the original baths before they were closed in the 1930s because of disrepair, damage, and bacteriological pollution. By 1940, Council had removed the buildings at the baths above high water mark but did not have sufficient funds available for any other work because 'funds are being used temporarily on unemployment works'. The baths appear to have functioned (at least officially) off and on until the facility ultimately closed sometime during 1962.

Bill Mitchell seawall and sandstone step entry points to Bill Mitchell Park

The seawall is a typical early to mid-twentieth century example of most that were constructed around Sydney during the period and associated with reclamation of foreshores around bays. The seawall is comparable in date, design, construction technique, and historical context with those also constructed nearby through civil works undertaken by Council to create foreshore parkland.

Possible use of the existing Brett Street and Western Crescent sandstone steps to provide improved access options to Bill Mitchell Park are being considered as part of the project. There are indications these steps (or their alignments from the residential streetscapes above) were in place by the early 1940s. It is unclear whether they are related to the seawall construction period of civil works undertaken to create the parkland at the head of Glades Bay, and/or were later 1960s additions forming a part of housing construction development that occurred during this time.

6.10.3 Potential impacts

The existing concrete paths in Bill Mitchell Park have been constructed at ground level and on the alignment of walkways that have been in this configuration since at least 1961. Following the current path pattern with upgraded walkways will therefore not alter the existing recreational layout and use structure of the park.

The proposal has been designed to mitigate any direct impacts to the Glades Bay Bath's stone steps and retaining wall at the waterline and the Bill Mitchell Park seawall.

6.10.4 Safeguards and mitigation measures

- Care would be taken during construction to ensure no damage to the Bill Mitchell Park seawall.
- The boardwalk at Bill Mitchell Park would be designed to avoid direct impacts on the seawall.
- The Glades Bay Baths (steps and sandstone wall) would a designated no go zone during construction and appropriately marked on construction plans.
- If any potential heritage items uncovered during the works, works would be stopped and the City of Ryde Environment Representative would be contacted. If the items are likely to be of significance then the Heritage Branch would be contacted.

6.11 WASTE AND RESOURCE MANAGEMENT

6.11.1 Policy setting

Waste management would be undertaken in accordance with the Waste Avoidance and Resource Recovery Act 2001.

The objectives of this Act are:

(a) to encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development,

(b) to ensure that resource management options are considered against a hierarchy of the following order:

i) avoidance of unnecessary resource consumption,

ii) resource recovery (including reuse, reprocessing, recycling and energy recovery),

iii) disposal,

(c) to provide for the continual reduction in waste generation,

(d) to minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste,

(e) to ensure that industry shares with the community the responsibility for reducing and dealing with waste,

(f) to ensure the efficient funding of waste and resource management planning, programs and service delivery,

(g) to achieve integrated waste and resource management planning, programs and service delivery on a State-wide basis,

(h) to assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997.

Part 7.2 of the Ryde City Council DCP also provides further guidance to waste minimisation and management.

6.11.2 Potential impacts

Waste would be created through vegetation removal (mostly trimming), excavations and construction material.

The fill material is generally classed as General Solid Waste (non-putrescible) (GSW) containing asbestos, GSW containing treated ASS and GSW. The natural material containing ASS (in low lying areas) is classed as GSW containing treated ASS and the sandstone bedrock is classed as Virgin Excavated Natural Material (VENM) (EIS 2012).

6.11.3 Safeguards and mitigation measures

- A Site Waste Minimisation and Management Plan (SWMMP) would be prepared in accordance with Part 7.2 of the Ryde City Council Development Control Plan 2008. The plan would take into consideration the results and recommendations of EIS (2012).
- The use of recycled material in construction should be considered.
- Resource management hierarchy principles are to be followed:
  -Avoid unnecessary resource consumption as a priority.
  -Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery).
  -Disposal is undertaken as a last resort
  (in accordance with the Waste Avoidance & Resource Recovery Act 2001)
- Waste is not to be burnt on site.
- Waste material is not to be left on site once the works have been completed.
- Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working shift.

6.12 CUMULATIVE IMPACTS

Cumulative environmental impacts result from the combined effect of individual impacts associated with the proposal in addition to the impacts of other activities in the area.

6.12.1 Potential impacts

The proposed works would contribute to the overall Ryde River Walk Master Plan and is one of the last four sections of the walk to be implemented. It would create a regional route along the Parramatta foreshore and link existing parks, reserves and public spaces by a regional system of recreational trails (refer to section 2.1).

7 SUMMARY OF SAFEGUARDS

7.1 ENVIRONMENTAL MANAGEMENT PLANS

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Contractors Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. These plans will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The plans will be prepared prior to construction of the proposal and must be reviewed and certified by Council prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements.

7.2 SUMMARY OF SAFEGUARDS AND MANAGEMENT MEASURES

Key Environmental Safeguards.

Major Issues	Key Environmental Objectives
Soils and Water Quality	• An Erosion and Sedimentation Control Plan (ESCP) would be prepared as part of the Construction Environmental Management Plan (CEMP) for the proposal prior to the commencement of construction. The ESCP would incorporate specifications outlined in the NSW Soils and Construction – Managing Urban Stormwater Volume 1 "the Blue Book"(Landcom, 2004). Controls would need to avoid any potential impacts to Looking Glass Bay and the creek. • The CEMP including the ESCP would be reviewed by Council prior to implementation. • Environmental Work Method Statements (EWMS) would be prepared for high risk activities such as the boardwalk over water. The EWMS would include: o Description of works/activities including machinery o Outline of the sequence of the works/activities. o Identification of environmental impacts due to works/activities. o An environmental risk assessment to determine potential risks to discrete work elements or activities likely to affect the environment or residents. o A map indicating the locations of sensitive areas. o Evaluation of methods to reduce environmental risks. o Mitigation measures to reduce environmental risks. o A process for assessing the performance of the implemented mitigation measures.

	o A process for resolving environmental issues and conflicts. o Emergency procedures for chemical spills and other potential emergency incidents. • The EWMS would be forwarded by the Project Manager to the Council's environmental officer for review and approval prior to commencement of works. • A procedure would be prepared to manage ASS in accordance with the ASS Manual (Stone et al 1998) prior to construction. • An incident emergency spill plan would be developed and incorporated into the CEMP. The plan would include measures to avoid spillages of fuels, chemicals, and fluids onto any surfaces or into Glades Bay or the creek and an emergency response plan. An emergency spill kit would be kept onsite at all times. • In the event of an incident the OEH would be notified of any incidents resulting in environmental harm as per Part 5.7 of the *Protection of the Environment Operations Act 1997*. • All staff would be inducted into the incident emergency spill procedures and made aware of the location of emergency spill kits. • Should a spill occur during construction, the incident emergency spill plan would be implemented, and Council's Environmental Officer would be contacted. • All fuels, chemicals, and liquids would be stored at least 40 metres away from any waterways or drainage lines and would be stored in an impervious bunded area within the compound site. Where chemicals, and liquids need to be stored on the barge these would be stored in an impervious bund. The volume of the bunded area would be at least 110% of the volume of the largest tank or 25% of the total stored product, if small containers are used (whichever volume is greater). • The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas off site. • Any material transported onto pavement surfaces would be swept and removed at the end of each working day. • Access to waterways using barges/boats or similar is to be via an existing boat ramp with no disturbance to the bank or surrounding vegetation.
Hydrology	• Sea level rise would be considered in the detailed design of the boardwalk in accordance with the NSW Coastal Planning Guideline: Adapting to sea level rise (DoP 2010). • The stormwater outlets would not be blocked during construction or operation.
Biodiversity	• The boardwalk would avoid the mangrove stands including the areas

of pneumatophores as much as possible.

- The boardwalk including the viewing platform along the southern section of boardwalk (near the southern entrance to Glades Bay Park) would be designed to minimise any potential impacts to the mangroves and avoid any impacts to the saltmarsh.
- Construction workers would be made aware of the sensitive nature of the environment prior to construction, in particular the importance to avoid and/or minimise impacts to mangroves and saltmarsh.
- The CEMP would include a map showing the location of the ecological constraints on site. No go-zones would be clearly indicated on maps and would include:
    - The saltmarsh
    - Mangroves stands where construction is not required
    - The dense bushland vegetation within Glades Bay Park
- No new access tracks for construction purposes would be created. Construction plant would use existing tracks and avoid or minimise any potential disturbance to the surrounding bushland. Dedicated turning areas for construction plant would be selected in areas that would cause the least disturbance (ie cleared grassy areas, or areas with minimal native vegetation).
- The design of the paths and car park would ensure that there would be no impacts to the long term health and stability of any trees. Advice from a qualified arborist would be sought during the detailed design.
- No excavation that would alter the flow/tides within the intertidal zones would be allowed.
- No mangroves would be removed as part of the works. Only trimming would be allowed under a permit from DPI (Fisheries).
- A permit under Part 7 of the Fisheries Management Act would be required for potential harm to marine vegetation (mangroves and saltmarsh).
- Educational signage on estuarine habitats (saltmarsh and mangroves) should be provided.
- Approval from Roads and Maritime Services (Maritime Division) would be required for works below the mean high tide mark. As such a permit under the FM Act for dredging and reclamation would not be required and instead DPI (Fisheries) would be notified of proposed dredging and reclamation works in accordance with clause 199 of the FM Act.
- The barge would avoid and not anchor or rest within areas of

	mangroves and their pneumatophores.
Noise and vibration	• Works would only be carried out during standard working hours (i.e 7am–6pm Monday to Friday, 8am–1pm Saturdays). • Measures would be developed in accordance with the interim construction noise guidelines (DECCW 2009) and form part of the CEMP to manage potential construction noise once final construction methodology is known. • Regular updates on the proposal would be provided to the community. • A community liaison phone number and site contact would be provided so that noise and or vibration-related complaints if any can be received and addressed in a timely manner. • Once final construction methodologies are known, vibration emission levels from each plant, in particular the piling rig, rollers and wacker packers, would be assessed prior to the commencement of construction works and the potential impacts of vibration on nearby residences and the sea wall would be determined. Safe buffer distances and other feasible measures (choice of plant) would be determined to avoid structural damage to sensitive receivers, in particular the seawall. • Sudden stop/start movements of tracked equipment should be avoided in proximity to the seawall at Bill Mitchell Park in order to reduce transmission of potentially damaging ground vibrations to the seawall. Construction plant work within a zone defined by a line off-set a lateral distance of 3m from the crest of the seawall should be avoided. This zone should be clearly marked out on site.
Air quality	• Plant and machinery would be maintained in accordance with manufacturer's specification. • Smoky emissions will be kept within the standards and regulations under the Protection of the Environment Operations Act 1997 (PoEO Act) that no vehicle shall have continuous smoky emissions for more than 10 seconds. • Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust. • Stockpiles or areas that may generate dust are to be managed to suppress dust emissions. • Vegetation or other materials are not to be burnt on site. • Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.
Traffic and access	• Driveway accesses would not be impeded at any time during

	construction. • Accesses to Bill Mitchell Park and/or the foreshore of Glades Bay for residents with direct access to these would be retained. • Bill Mitchell Park and Glades Bay Park would remain accessible to the public throughout the construction period. Construction would be staged to ensure that no more than one access point to the park is blocked at any one time. • Loading of the barge with construction plant and material including piling rig would be undertaken from existing boat ramps in the area. • Boat owners and residents with foreshore properties would be notified of the timing of any construction works that would impact them. • The proposed parking at Bill Mitchell Park should include parking spaces for the disabled.
Visual amenity	• Landscaping in the south western and south eastern corner would be considered to ensure water views for local residents are not obstructed. • Detailed design would consider the use of boardwalk materials that minimises potential visual impacts (e.g. no use of bright colours).
Socio-economics	• Local residents would be advised of the proposed works at least two weeks prior to construction commencing through a letter box drop. • Appropriate signage would be placed at the entrances to the park to advise users of proposed works prior to start of construction. • Dial before you dig would be undertaken to determine locations of all underground utilities prior to detailed design and construction. The design and construction of the proposed river walk should avoid impacts to utilities.
Aboriginal heritage	• All known Aboriginal heritage sites would be identified on a map and included in site inductions to make construction staff aware of the sensitivity of the sites to construction impacts. Where possible all these sites would be considered no go zones. • Provision of additional heritage signage along the proposed paths in Bill Mitchell Park. The MLALC and AHO have advised on how signs can be placed without specifically pointing out where sensitive heritage sites are located and what kind of messages they should convey to visitors. • A site-specific Heritage Impact Statement (HIS) would be prepared for the Ross Street Reserve, for the Glades Bay Park foreshore sites and for the Glades Bay Park Aboriginal Rock Engraving & Axe Grinding Groove Sites when design and construction options for these

	components of the proposal are confirmed. The HIS would be developed in consultation with the MLALC and would identify adequate levels of heritage site protection and appropriate conservation and management approaches. The HIS would also identify the need for an Aboriginal Heritage Impact Permit (AHIP) to be sought from the OEH to guide future works. Potential heritage management options and actions may include: o Targeted archaeological test excavation (with an approved OEH AHIP) in planned pier hole locations to establish the presence or absence of midden materials in order to accurately map these occurrences to a level that cannot be achieved by field inspection alone. This would identify where the boardwalk alignment could be created with no foreseeable Aboriginal heritage constraints. o If any potential heritage items uncovered during the works, works would be stopped and the City of Ryde Environment Representative would be contacted. If the items are likely to be of significance then the Heritage Branch would be contacted.
Non-Aboriginal heritage	• Care would be taken during construction to ensure no damage to the Bill Mitchell Park seawall. • The boardwalk at Bill Mitchell Park would be designed to avoid direct impacts on the seawall. • The Glades Bay Baths (steps and sandstone wall) would a designated no go zone during construction and appropriately marked on construction plans. • If any potential heritage items uncovered during the works, works would be stopped and the City of Ryde Environment Representative would be contacted. If the items are likely to be of significance then the Heritage Branch would be contacted.
Waste and resource management	• A Site Waste Minimisation and Management Plan (SWMMP) would be prepared in accordance with Part 7.2 of the Ryde City Council Development Control Plan 2008. The plan would take into consideration the results and recommendations of EIS (2012). • The use of recycled material in construction should be considered. • Resource management hierarchy principles are to be followed: -Avoid unnecessary resource consumption as a priority. -Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery). -Disposal is undertaken as a last resort (in accordance with the Waste Avoidance & Resource Recovery Act 2001)

- Waste is not to be burnt on site.
- Waste material is not to be left on site once the works have been completed.
- Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working shift.

7.3 LICENSES AND APPROVALS

Table Summary of Licenses and Approvals Required

Legal Instrument	License or Approval
Fisheries Management Act 1994	• A permit under Part 7 of the FM Act is required if any dredging or reclamation works are to be undertaken unless these works are approved by another relevant public authority (other than a council) in which case the Minister for Primary Industries needs to be notified in accordance with Section 199 of the Fisheries Management Act 1994. Consent from RMS (Maritime division) would be required for reclamation works (boardwalk below mean high water mark).
Fisheries Management Act 1994	• A permit under Part 7 of the FM is required if any works are likely to harm any marine vegetation such as mangroves and saltmarsh.

8 CONCLUSION

8.1 PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT

8.1.1 The precautionary principle

Namely that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. This statement of environmental effects has been prepared utilising the precautionary principle. That is, if threats are perceived as possibly leading to serious or irreversible environmental damage, then either the non-development of the proposal would occur, or the development modified to ensure that such threats do not exist. This has been the approach in relation to recommendations itemised in Section 7.

8.1.2 Inter-generational equity

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. The proposed works would not impact on natural features to a level that would compromise the health, diversity or productivity of the environment to a level that would impact on future generations. Proposed works would improve access to the park for a various users.

8.1.3 Conservation of biological diversity and ecological integrity

The proposed works would not compromise the biological diversity and ecological integrity of Glades Bay and Glades Bay Park. The proposed boardwalk would improve the protection of the threatened coastal saltmarsh present on the foreshore of the bay near Ross Street.

8.1.4 Appropriate valuation of environmental factors

The proposed design has taken into consideration maintenance of the structures to minimise costs over the lifetime of the development.

8.2 COMPLIANCE WITH MATTERS LISTED IN CLAUSE 79C(1) OF THE EP&A ACT

In determining a development application, a consent authority is to take into consideration the matters listed in clause 79C(1) of the EP&A Act. The following table lists the matters and the compliance of the proposal.

Table 8-1 Clause 79C(1) of the EP&A Act matters

Clause 79C(1) matter	Response
Take into consideration the provisions of any environmental planning	Refer to Section 4

Clause 79C(1) matter	Response
instrument.	
Take into consideration the provisions of any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Director-General has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	No proposed instrument that is or has been the subject of public consultation under this Act applies to the proposal.
Take into consideration the provisions of any development control plan.	Refer to Table 4-1
Take into consideration the provisions of any planning agreement that has been entered into under section 93F, or any draft planning agreement that a developer has offered to enter into under section 93F.	There are no planning agreements under section 93F pertaining to the proposal.
Take into consideration the provisions of the regulations (to the extent that they prescribe matters for the purposes of this paragraph).	This SEE has been prepared to comply with the EP&A Act and Regulations.
Take into consideration the provisions of any coastal zone management plan (within the meaning of the *Coastal Protection Act 1979*)	A draft Parramatta River Estuary Coastal Zone Management Plan (CZMP) is currently being prepared. No coastal zone management plan currently applies to the proposal.
Take into consideration the likely impacts of that development, including environmental impacts on both the natural and built	Refer to Section 6

Clause 79C(1) matter	Response
environments, and social and economic impacts in the locality,	
Take into consideration the suitability of the site for the development.	The proposal would formalise existing paths through an existing council park.
Take into consideration any submissions made in accordance with this Act or the regulations.	Consultation has been undertaken as part of this proposal as described in Section 5. This SEE and concept design would be provided to the public for comment. Any submissions would be considered in finalising any designs.
Take into consideration the public interest.	Consultation has been undertaken as part of this proposal as described in Section 5 and the current concept design has incorporated feedback from the public. This SEE and concept design would be provided to the public for comment.

8.3 CONCLUSION

The proposal is subject to assessment under Part 4 of the EP&A Act. The SEE has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity. This has included consideration of conservation agreements and plans of management under the NPW Act, joint management and biobanking agreements under the TSC Act, wilderness areas, critical habitat, impacts on threatened species, populations and ecological communities and their habitats and other protected fauna and native plants.

The proposal as described in the SEE best meets the project objectives but would still result in some temporary construction impacts, mostly due to construction noise. Mitigation measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also improve access to Bill Mitchell Park, Glades Bay Park and the Parramatta River foreshore for all users through formalised paths and access points. On balance the proposal is considered justified.

The environmental impacts of the proposal are not likely to be significant and therefore it is not necessary for an environmental impact statement to be prepared and approval to be sought for the proposal from the Minister for Planning. The proposal is unlikely to affect threatened species, populations or ecological communities or their habitats, within the meaning of the Threatened Species Conservation Act 1995 or Fisheries Management Act 1994 and therefore a Species Impact Statement is not required. The proposal is also unlikely to affect Commonwealth land or have an impact on any matters of national environmental significance

9 CERTIFICATION

This SEE provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.

Company: **ngh**environmental

Name: Natascha Arens

Position: Director

Date: 23/11/2012

10 REFERENCES

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Appendices

APPENDIX A SITE PHOTOGRAPHS 13.10.2011

Figure 1: Further up, facing north off Bill Mitchel Park onto Morrison Road and location of proposed car park.

Figure 2: Looking south onto Bill Mitchell Park.

Figure 3: Within Bill Mitchell Park, facing west at the steps to Brett Street.

Figure 4: Within Bill Mitchell Park, facing east to steps leading to West Crescent.

Figure 5:Facing south within Bill Mitchell Park- view of the rock outcrop and native vegetation.

Figure 6: Facing south onto Glades Bay, low tide shows sandstone seawall to the left. Location of proposed boardwalk over water.

Figure 7: Facing south view of sandstone seawall and mangroves.

Figure 8: Facing south at location of dinghy boat storage area. Rocky platforms along the foreshore.

Figure 9: Facing north from dinghy storahe boat storage area. Rocky platform, mangroves and mudflat

Figure 10:Rocky ntertidal area to the right behind private property with saltmarsh area to the left.

Figure 11: Foreshore of Galdes Bay with mangrove stands to the left.

Figure 12: Path through Glades Bay Park.

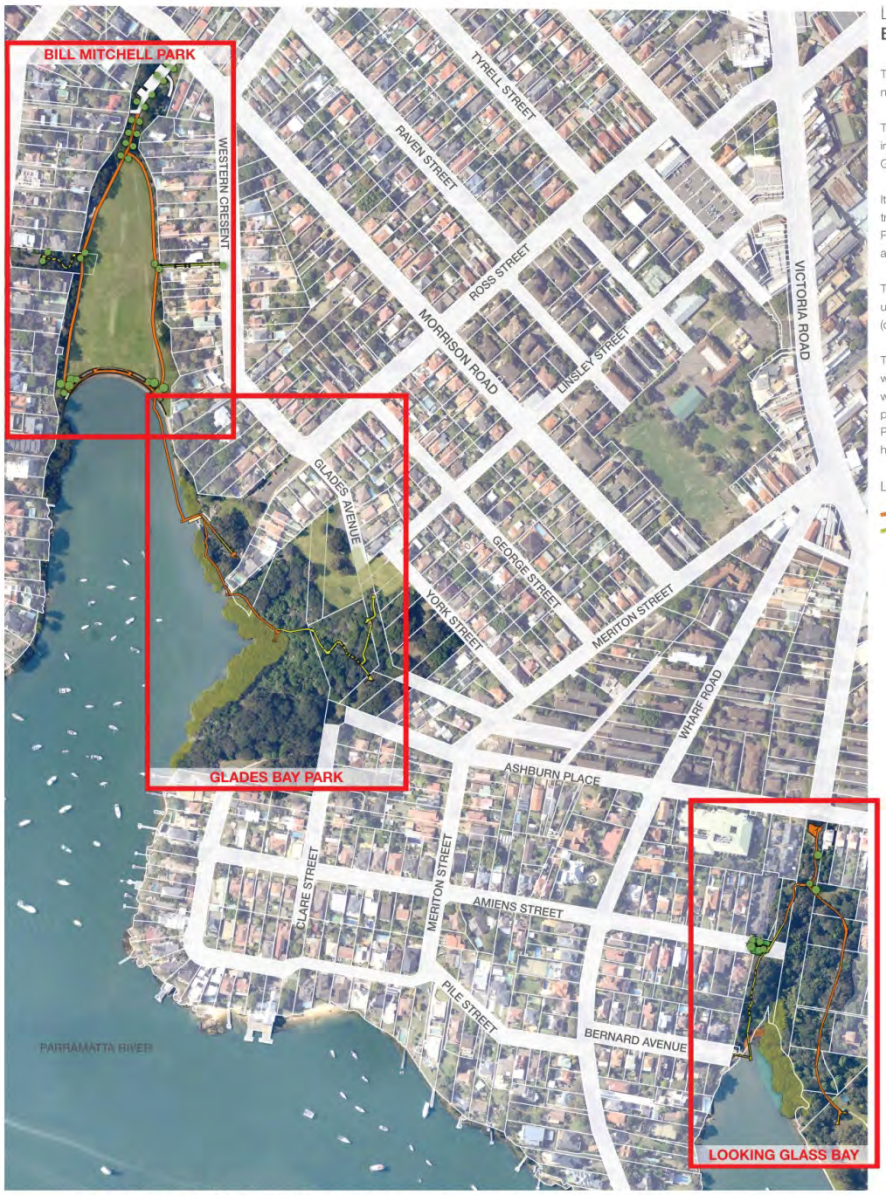
Figure 13: Wooden boardwalk through a section of Glades Bay Park.

Figure 14: Path through Glades Bay Park.

Figure 15: Path through Glades Bay Park.

APPENDIX B CONCEPT DESIGN

Landscape Plan | **Context**



Landscape Master Plan | **Background**

The Ryde Riverwalk is an 8km trail located alongside the northern edge of the Parramatta River in Gladesville.

The site scope formalises a 2km (approx.) of existing informal trail along the coastal edge of Bill Mitchell Park, Glades Bay Park, and Looking Glass Bay Park.

It forms part of a regional river walk that follows existing trails and roads in Ryde from Wharf Road in the east to Punt Road in the west via a series of interconnected parks and reserves (see Ryde River Walk Master Plan, 2007).

The site area encompasses 3 of the 4 remaining park upgrades to complete the entire River walk Master plan (only Banjo Patterson Park on the western end remains)

The existing route is also well known to local bush walkers, and is listed on the 'Walking Coastal Sydney' website for the Walking Volunteers. Importantly, it forms part of a coastal walk that stretches from Woolwich to Parramatta, and traverses sites of Aboriginal and cultural history, ecological importance, and spectacular scenery.

Landscape Plan | **Key**

- Accessible Path Network (no stairs)
- Path Network with stairs

Strategy | **Principles and key considerations**

The landscape concept is a response to;

- Providing an imtimate scaled pathway that formalises an existing trail.
- Maximising the extent of accessible pathway where grades permit
- Respecting the neighboring property interface through careful siting of the pathway and boardwalk
- Ensuring that the pathway is located to prevent impact on historical (both Aboriginal and Colonial) artefacts
- Locating and designing the pathway to minimise impact on vegetation. Locating the pathway away from the most significant vegetation communities (Saltmarsh)
- Providing a variety of experiences along the pathway, with opportunities to rest, read about the local history and absorb the views.
- Providing carparking to prevent impacts on local roads for users of the path.
- Providing a design that is unique to Ryde, and unified in its character.
- Providing a scheme that is sustainable; is robust and achieves a 50yr lifespan.
- Enhacing the natural environemt through provision of additional tree and understory planting.

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: NB/EO
Checked: SC

Scale: 1:2000 @ A1

Landscape Master Plan | Development Application

Dwg no.: 11050-L001
Rev: C
Date: November 2012

Landscape Plan | **Bill Mitchell Park**

Landscape Plan | **Context**

Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. 2.5m Concrete path, appropriate for vehicular loads (bin collection/ maintenance vehicle)
2. New carpark. Asphalt surface with new avenue planting of Angophora costata
3. Existing soccer field rotated to remove goal posts from main line of sight.
4. Existing seawall to be retained. New gathering space, low brick walls with integrated seating, crushed stabilised sandstone surface and new sporting fence within mass planting
5. Grove native trees including Eucalyptus botryoides and Glochidion ferdinandi. Mass understory of native grasses and groundcovers
6. New bech seats: steel with timber slats.

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

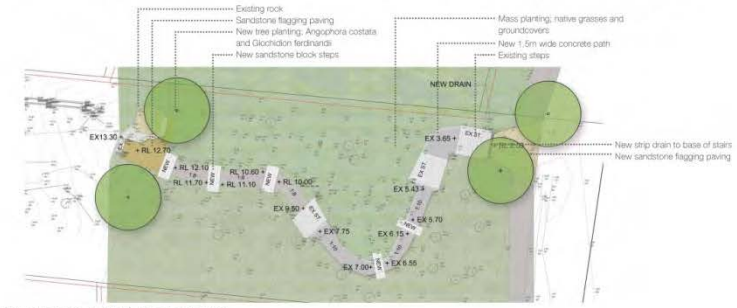
Drawn: NB/EO
Checked: SC

Scale: 1:500 @ A1

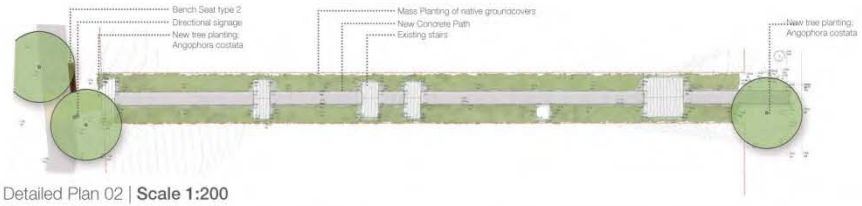
Landscape Master Plan | Development Application

Dwg no.: 11050-L002
Rev: C
Date: November 2012

Landscape Plans, Sections & Perspectives | **Bill Mitchell Park**



Detailed Plan 01 | **Scale 1:200**



Detailed Plan 02 | **Scale 1:200**

Section 01 | **Scale 1:100**

Elevation 01 | **Scale 1:100**

Perspective 01 | **Bill Mitchell Reserve looking south**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: NB/EO
Checked: SC

Scale: 1:500 @ A1

0 10 20 30 40m

Landscape Master Plan | Development Application

Dwg no. : 11050-L003
Rev: C
Date: November 2012

Landscape Plan | **Glades Bay**

Landscape Plan | **Context**

Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. 1.8m wide fiberglass mesh boardwalk with balustrade.
2. Existing dingy storage rack. New 'slip way' ramp into water.
3. Upgrade existing stairs: crushed stabilised sandstone path with sandstone stairs.
4. Lookout with sandstone flagging and seat.
5. Existing salt marsh to be protected.
6. New 1.5m wide Fibreglass mesh boardwalk through bushland. Low profile to existing ground.
7. Remove existing fiberglass mesh and replace with crushed stabilised sandstone pathway.
8. Preserve existing aboriginal sites.
9. Existing bridge removed. New bridge located adjacent to protect existing Glochidion trees.
10. New surface: fibreglass mesh, on existing bridge structure over creeks.
11. Rest areas with integrated seating in interpretive signage.
12. On-grade pathway; crushed stabilised sandstone path, 1.5m wide, with sandstone steps.

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

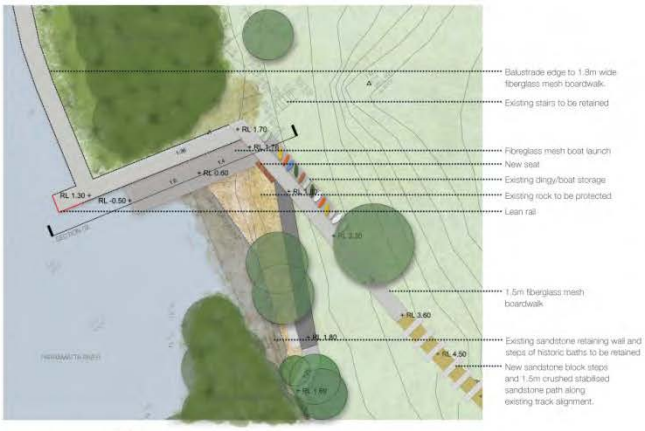
Client: City of Ryde

Drawn: NB/EO
Checked: SC

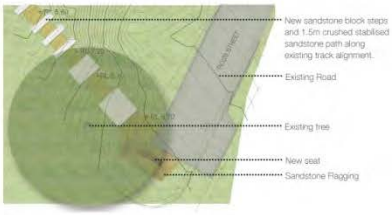
Scale: 1:500 @ A1

Landscape Master Plan | Development Application

Dwg no.: 11050-L004
Rev: C
Date: November 2012



Detailed Plan 03 | **Scale 1:200**



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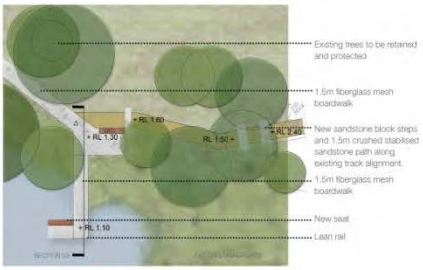
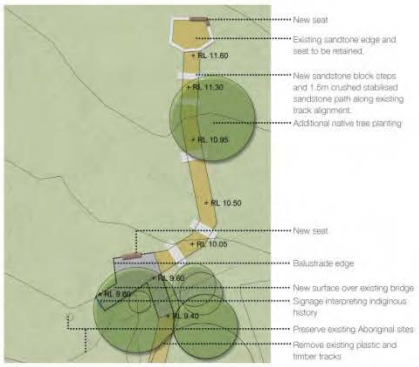


Detailed Plan 05| **Scale 1:200**



Detailed Plan 06| **Scale 1:200**

Section 02 | **Scale 1:100**

Section 03 | **Scale 1:100**

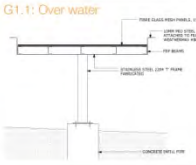
Perspective 02 | **Glades Bay Reserve looking south-east**

Landscape Plan | **Materials Palette**

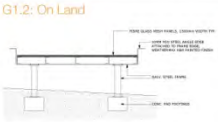
SURFACES & STAIRS

Ground Surface Type 1:
Fibreglass Mesh
- 1.5m wide generally
- 1.8m wide with balustrades
- Used for sections over water or undulating land

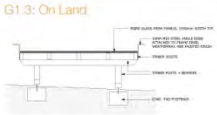
G1.1: Over water



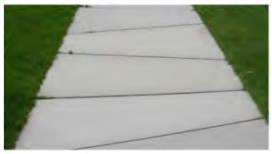
G1.2: On Land



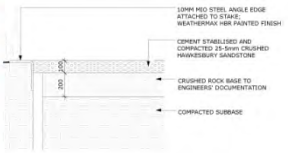
G1.3: On Land



Ground Surface Type 2:
Insitu Concrete Paving
- 1.5m wide
- Decorative diagonal sawcuts at 600mm cts
- Used for on-grade paths where grades exceed 1:20



Ground Surface Type 3:
Crushed Stabilised Sandstone
- 1.5m wide
- Used at entries, rest areas and to water's edge of Bill Mitchell Park



Ground Surface Type 4:
Sandstone Flagging
- Mortar jointed and laid on concrete base
- Used at entries and path junctions

Stairs Type 1:
Sandstone block steps
- 2.6m wide
- Used at entries and within bushland areas

WALLS & SEATS

Walls Type 1:
Brick Wall
- Double course brick wall
- Mass concrete footing
- Used at Bill Mitchell Park water's edge

Bench Seat type 1:
Folded steel edge
- With or without backrest
- M10 10mm folded steel plate
- Installed at edge of boardwalk and rest stops

Bench Seat type 2:
Folded steel with composite battens
- M10 10mm folded steel frame
- Composite plastic battens
- Attached to wall at Bill Mitchell Park
- Free standing seats at rest stops

EDGES

Folded Steel Edge Treatments:
1. Flush Edge
2. Kickrail
3. Perch Seat
4. Signage Plinth
5. Directional Signage
6. Lean Rail
7. Balustrade

PLANTING

Tree Type 1:
Native Evergreen Tree

Species:
- Eucalytpus botrioydes
- Glochidion ferdinandi
- Angophora costata

Mass Planting Type 1:
Native Understorey Grasses and Groundcovers (0.5m max height)

Species:
- Lomandra longifolia
- Dianella caerulea
- dianella prunina
- Isolepis nodosa
- bursaria spinosa
- dodonaea triquetra
- lomandra filiformis
- hardenbergia violacea
- juncus usitatus
- kennedia rubicunda
- banksia serrata
- olearia microphylla
- wahlenbergia ssp.
- hakea dactyloides

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: NB/EO
Checked: SC

Scale: 1:500 @ A1

Landscape Master Plan | Development Application

Dwg no.: 11050-L008
Rev: C
Date: November 2012

APPENDIX C DATABASE SEARCHES

Australian Government

Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

Report created: 31/07/12 12:56:26

Coordinates

Buffer: 1.0Km

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	31
Migratory Species:	35

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	37
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	9
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	15
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Threatened Species		[Resource Information]
Name	Status	Type of Presence
BIRDS		
Anthochaera phrygia		
Regent Honeyeater [82338]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
FROGS		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
MAMMALS		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (Eastern) [68050]	Endangered	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANTS		

Name	Status	Type of Presence
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area
Pelargonium sp. Striatellum (G.W.Carr 10345) Omeo Stork's-bill [84065]	Endangered	Species or species habitat may occur within area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat may occur within area
Pimelea spicata [20834]	Endangered	Species or species habitat may occur within area
Streblus pendulinus Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area
Tetratheca glandulosa Glandular Pink-bell [2350]	Vulnerable	Species or species habitat may occur within area
REPTILES		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area

Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Marine Species		

Name	Threatened	Type of Presence
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Species or species habitat may occur within area
Lamna nasus		
Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Breeding likely to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Breeding may occur within area
Xanthomyza phrygia		
Regent Honeyeater [430]	Endangered*	Species or species habitat likely to occur within area
Migratory Wetlands Species		
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres		
Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew [847]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Defence Housing Authority

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]		Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding likely to occur within area
Numenius madagascariensis Eastern Curlew [847]		Species or species habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Breeding may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Vulnerable*	Species or species habitat likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat may occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area

Extra Information

Places on the RNE [Resource Information]

Note that not all Indigenous sites may be listed.

Name	State	Status
Natural		
Parramatta and Lane Cove Rivers Landscapes	NSW	Indicative Place
Historic		
Avondale	NSW	Indicative Place
Dunham House	NSW	Indicative Place
Hunters Hill Conservation Area Extension	NSW	Indicative Place
Gladesville Mental Hospital Precinct	NSW	Registered
House	NSW	Registered
Hunters Hill Conservation Area	NSW	Registered
Mendip	NSW	Registered
Punt Road Gates	NSW	Registered

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit,

Name	Status	Type of Presence
Frogs		
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Mammals		
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within

Name	Status	Type of Presence
		area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

Coordinates

-33.83395 151.12029

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area

- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions.
Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded 0.01°).

Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) Entities in RYDE LGA returned a total of 128 records of 170 species.
Report generated on 28/10/2012 8:31 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status
Animalia	Amphibia	Myobatrachidae	3137	*Crinia tinnula*		Wallum Froglet	V,P
Animalia	Amphibia	Myobatrachidae	3042	*Heleioporus australiacus*		Giant Burrowing Frog	V,P
Animalia	Amphibia	Myobatrachidae	3116	*Pseudophryne australis*		Red-crowned Toadlet	V,P
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P
Animalia	Amphibia	Hylidae	3169	*Litoria brevipalmata*		Green-thighed Frog	V,P
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P
Animalia	Reptilia	Dermochelyidae	2013	*Dermochelys coriacea*		Leatherback Turtle	E1,P
Animalia	Reptilia	Varanidae	2287	*Varanus rosenbergi*		Rosenberg's Goanna	V,P
Animalia	Reptilia	Elapidae	2676	*^Hoplocephalus bungaroides*		Broad-headed Snake	E1,P,2
Animalia	Aves	Anatidae	0200	*Nettapus coromandelianus*		Cotton Pygmy-Goose	E1,P
Animalia	Aves	Ciconiidae	0183	*Ephippiorhynchus asiaticus*		Black-necked Stork	E1,P
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*		Australasian Bittern	E1,P
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*		Black Bittern	V,P
Animalia	Aves	Accipitridae	0218	*Circus assimilis*		Spotted Harrier	V,P
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*		Little Eagle	V,P
Animalia	Aves	Accipitridae	8739	*Pandion cristatus*		Eastern Osprey	V,P
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*		Bush Stone-curlew	E1,P
Animalia	Aves	Burhinidae	0175	*Esacus magnirostris*		Beach Stone-curlew	E4A,P

Animalia	Aves	Haematopodidae	0131	*Haematopus fuliginosus*	Sooty Oystercatcher	V,P
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*	Pied Oystercatcher	E1,P
Animalia	Aves	Charadriidae	0141	*Charadrius leschenaultii*	Greater Sand-plover	V,P
Animalia	Aves	Charadriidae	0139	*Charadrius mongolus*	Lesser Sand-plover	V,P
Animalia	Aves	Rostratulidae	0170	*Rostratula australis*	Australian Painted Snipe	E1,P
Animalia	Aves	Scolopacidae	0166	*Calidris alba*	Sanderling	V,P
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*	Curlew Sandpiper	E1,P
Animalia	Aves	Scolopacidae	0165	*Calidris tenuirostris*	Great Knot	V,P
Animalia	Aves	Scolopacidae	0167	*Limicola falcinellus*	Broad-billed Sandpiper	V,P
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*	Black-tailed Godwit	V,P
Animalia	Aves	Scolopacidae	0160	*Xenus cinereus*	Terek Sandpiper	V,P
Animalia	Aves	Laridae	0117	*Sternula albifrons*	Little Tern	E1,P
Animalia	Aves	Cacatuidae	0268	*^^Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3
Animalia	Aves	Cacatuidae	0265	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*	Little Lorikeet	V,P
Animalia	Aves	Psittacidae	0309	*^^Lathamus discolor*	Swift Parrot	E1,P,3
Animalia	Aves	Psittacidae	0305	*^^Neophema chrysogaster*	Orange-bellied Parrot	E4A,P,3
Animalia	Aves	Psittacidae	8913	*^^Pezoporus wallicus wallicus*	Eastern Ground Parrot	V,P,3
Animalia	Aves	Strigidae	0246	*^^Ninox connivens*	Barking Owl	V,P,3
Animalia	Aves	Strigidae	0248	*^^Ninox strenua*	Powerful Owl	V,P,3
Animalia	Aves	Tytonidae	0250	*^^Tyto novaehollandiae*	Masked Owl	V,P,3
Animalia	Aves	Climacteridae	8127	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P
Animalia	Aves	Dasyornithidae	0519	*Dasyornis brachypterus*	Eastern Bristlebird	E1,P
Animalia	Aves	Acanthizidae	0504	*Chthonicola sagittata*	Speckled Warbler	V,P

Animalia	Aves	Meliphagidae	0603	*Anthochaera phrygia*	Regent Honeyeater	E4A,P
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	E2,V,P
Animalia	Aves	Meliphagidae	0598	*Grantiella picta*	Painted Honeyeater	V,P
Animalia	Aves	Meliphagidae	8303	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P
Animalia	Aves	Petroicidae	8367	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V,P
Animalia	Aves	Petroicidae	0380	*Petroica boodang*	Scarlet Robin	V,P
Animalia	Aves	Petroicidae	0382	*Petroica phoenicea*	Flame Robin	V,P
Animalia	Aves	Estrildidae	0652	*Stagonopleura guttata*	Diamond Firetail	V,P
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P
Animalia	Mammalia	Peramelidae	1710	*Isoodon obesulus obesulus*	Southern Brown Bandicoot (eastern)	E1,P
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	V,P
Animalia	Mammalia	Burramyidae	1150	*Cercartetus nanus*	Eastern Pygmy-possum	V,P
Animalia	Mammalia	Petauridae	1136	*Petaurus australis*	Yellow-bellied Glider	V,P
Animalia	Mammalia	Petauridae	1137	*Petaurus norfolcensis*	Squirrel Glider	V,P
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P
Animalia	Mammalia	Molossidae	1329	*Mormopterus norfolkensis*	Eastern Freetail-bat	V,P
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P
Animalia	Mammalia	Vespertilionidae	1346	*Miniopterus australis*	Little Bentwing-bat	V,P
Animalia	Mammalia	Vespertilionidae	1834	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V,P

Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*	Southern Myotis	V,P
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P
Animalia	Gastropoda	Camaenidae	I006	*Meridolum corneovirens*	Cumberland Plain Land Snail	E1
Plantae	Flora	Apocynaceae	1226	*Cynanchum elegans*	White-flowered Wax Plant	E1,P
Plantae	Flora	Campanulaceae	1937	*Wahlenbergia multicaulis*	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	E2
Plantae	Flora	Casuarinaceae	8321	*^^Allocasuarina portuensis*	Nielsen Park She-oak	E1,P,3
Plantae	Flora	Convolvulaceae	2234	*Wilsonia backhousei*	Narrow-leafed Wilsonia	V,P
Plantae	Flora	Dilleniaceae	11422	*Hibbertia puberula*		E1,P
Plantae	Flora	Dilleniaceae	13902	*Hibbertia sp. Bankstown*		E4A,P
Plantae	Flora	Dilleniaceae	11250	*Hibbertia superans*		E1,P
Plantae	Flora	Elaeocarpaceae	6205	*Tetratheca glandulosa*		V,P
Plantae	Flora	Ericaceae	7752	*Epacris purpurascens var. purpurascens*		V,P
Plantae	Flora	Ericaceae	2618	*Leucopogon exolasius*	Woronora Beard-heath	V,P
Plantae	Flora	Euphorbiaceae	9851	*Chamaesyce psammogeton*	Sand Spurge	E1,P
Plantae	Flora	Fabaceae (Faboideae)	2853	*Dillwynia tenuifolia*		V,P
Plantae	Flora	Fabaceae (Faboideae)	3008	*Pultenaea pedunculata*	Matted Bush-pea	E1,P
Plantae	Flora	Fabaceae (Mimosoideae)	3728	*Acacia bynoeana*	Bynoe's Wattle	E1,P
Plantae	Flora	Fabaceae (Mimosoideae)	3860	*Acacia pubescens*	Downy Wattle	V,P
Plantae	Flora	Fabaceae (Mimosoideae)	9672	*Acacia terminalis subsp. terminalis*	Sunshine Wattle	E1,P

Plantae	Flora	Grammitidaceae	9471	^^*Grammitis stenophylla*	Narrow-leaf Finger Fern	E1,P,3
Plantae	Flora	Gyrostemonaceae	9411	^^*Gyrostemon thesioides*		E1,P,3
Plantae	Flora	Haloragaceae	3257	*Haloragodendron lucasii*		E1,P
Fungi	Flora	Hygrophoraceae	F006	*Camarophyllopsis kearneyi*		E1,P
Fungi	Flora	Hygrophoraceae	F003	*Hygrocybe anomala var. ianthinomarginata*		V,P
Fungi	Flora	Hygrophoraceae	F004	*Hygrocybe aurantipes*		V,P
Fungi	Flora	Hygrophoraceae	F001	*Hygrocybe austropratensis*		E1,P
Fungi	Flora	Hygrophoraceae	F007	*Hygrocybe collucera*		E1,P
Fungi	Flora	Hygrophoraceae	F008	*Hygrocybe griseoramosa*		E1,P
Fungi	Flora	Hygrophoraceae	F005	*Hygrocybe lanecovensis*		E1,P
Fungi	Flora	Hygrophoraceae	F002	*Hygrocybe reesiae*		V,P
Fungi	Flora	Hygrophoraceae	F015	*Hygrocybe rubronivea*		V,P
Plantae	Flora	Juncaginaceae	3363	*Maundia triglochinoides*		V,P
Plantae	Flora	Lamiaceae	3418	*Prostanthera marifolia*	Seaforth Mintbush	E4A,P
Plantae	Flora	Lobeliaceae	1911	^^*Hypsela sessiliflora*		E1,P,3
Plantae	Flora	Myrtaceae	4007	^^*Callistemon linearifolius*	Netted Bottle Brush	V,P,3
Plantae	Flora	Myrtaceae	4024	*Darwinia biflora*		V,P
Plantae	Flora	Myrtaceae	4067	*Eucalyptus camfieldii*	Camfield's Stringybark	V,P
Plantae	Flora	Myrtaceae	4134	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	V,P
Plantae	Flora	Myrtaceae	8314	*Leptospermum deanei*		V,P
Plantae	Flora	Myrtaceae	4248	*Melaleuca deanei*	Deane's Paperbark	V,P
Plantae	Flora	Myrtaceae	4293	*Syzygium paniculatum*	Magenta Lilly Pilly	E1,P
Plantae	Flora	Orchidaceae	4386	^*Caladenia tessellata*	Thick Lip Spider Orchid	E1,P,2
Plantae	Flora	Orchidaceae	4464	^*Genoplesium baueri*	Bauer's Midge Orchid	V,P,2

Plantae	Flora	Orchidaceae	9616	*^Microtis angusii*	Angus's Onion Orchid	E1,P,2
Plantae	Flora	Orchidaceae	4504	*^Prasophyllum fuscum*	Slaty Leek Orchid	E4A,P,2
Plantae	Flora	Orchidaceae	9615	*^Pterostylis saxicola*	Sydney Plains Greenhood	E1,P,2
Plantae	Flora	Orchidaceae	9479	*^Pterostylis sp. Botany Bay*	Botany Bay Bearded Orchid	E1,P,2
Plantae	Flora	Poaceae	4875	*Deyeuxia appressa*		E1,P
Plantae	Flora	Proteaceae	5365	*Grevillea caleyi*	Caley's Grevillea	E1,P
Plantae	Flora	Proteaceae	10009	*Grevillea parviflora subsp. parviflora*	Small-flower Grevillea	V,P
Plantae	Flora	Proteaceae	5458	*Persoonia hirsuta*	Hairy Geebung	E1,P
Plantae	Flora	Proteaceae	5467	*Persoonia nutans*	Nodding Geebung	E1,P
Plantae	Flora	Rhamnaceae	5591	*Pomaderris prunifolia*	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2
Plantae	Flora	Thymelaeaceae	6965	*Pimelea curviflora var. curviflora*		V,P
Plantae	Flora	Thymelaeaceae	6190	*Pimelea spicata*	Spiked Rice-flower	E1,P
Community				*Blue Gum High Forest in the Sydney Basin Bioregion*	Blue Gum High Forest in the Sydney Basin Bioregion	E4B
Community				*Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion*	Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V2
Community				*Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community				*Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion*	Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E3

Community	*Cumberland Plain Woodland in the Sydney Basin Bioregion*	Cumberland Plain Woodland in the Sydney Basin Bioregion	E4B
Community	*Duffys Forest Ecological Community in the Sydney Basin Bioregion*	Duffys Forest Ecological Community in the Sydney Basin Bioregion	E3
Community	*Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion*	Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion	E3
Community	*Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Moist Shale Woodland in the Sydney Basin Bioregion*	Moist Shale Woodland in the Sydney Basin Bioregion	E3
Community	*River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Shale gravel Transition Forest in the Sydney Basin Bioregion*	Shale gravel Transition Forest in the Sydney Basin Bioregion	E3
Community	*Shale/Sandstone Transition Forest*	Shale/Sandstone Transition Forest	E3
Community	*Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion*	Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	E3

Community	*Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Sydney Freshwater Wetlands in the Sydney Basin Bioregion*	Sydney Freshwater Wetlands in the Sydney Basin Bioregion	E3
Community	*Sydney Turpentine-Ironbark Forest*	Sydney Turpentine-Ironbark Forest	E3
Community	*Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions*	Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E3
Community	*Western Sydney Dry Rainforest in the Sydney Basin Bioregion*	Western Sydney Dry Rainforest in the Sydney Basin Bioregion	E3
Threat	*Alteration of habitat following subsidence due to longwall mining*	Alteration of habitat following subsidence due to longwall mining	KTP
Threat	*Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands*	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	KTP
Threat	*Anthropogenic Climate Change*	Anthropogenic Climate Change	KTP
Threat	*Bushrock removal*	Bushrock removal	KTP

Threat	*Clearing of native vegetation*	Clearing of native vegetation	KTP
Threat	*Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)*	Competition and grazing by the feral European Rabbit, Oryctolagus cuniculus (L.)	KTP
Threat	*Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758*	Competition and habitat degradation by Feral Goats, Capra hircus Linnaeus 1758	KTP
Threat	*Competition from feral honey bees, Apis mellifera L.*	Competition from feral honey bees, Apis mellifera L.	KTP
Threat	*Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners*	Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	KTP
Threat	*Herbivory and environmental degradation caused by feral deer*	Herbivory and environmental degradation caused by feral deer	KTP
Threat	*High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*	High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	KTP
Threat	*Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972*	Importation of Red Imported Fire Ants Solenopsis invicta Buren 1972	KTP
Threat	*Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations*	Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	KTP

Threat	*Infection of frogs by amphibian chytrid causing the disease chytridiomycosis*	Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	KTP
Threat	*Infection of native plants by Phytophthora cinnamomi*	Infection of native plants by Phytophthora cinnamomi	KTP
Threat	*Introduction of the Large Earth Bumblebee Bombus terrestris (L.)*	Introduction of the Large Earth Bumblebee Bombus terrestris (L.)	KTP
Threat	*Invasion and establishment of exotic vines and scramblers*	Invasion and establishment of exotic vines and scramblers	KTP
Threat	*Invasion and establishment of Scotch Broom (Cytisus scoparius)*	Invasion and establishment of Scotch Broom (Cytisus scoparius)	KTP
Threat	*Invasion and establishment of the Cane Toad (Bufo marinus)*	Invasion and establishment of the Cane Toad (Bufo marinus)	KTP
Threat	*Invasion of native plant communities by African Olive Olea europaea L. subsp. cuspidata (Wall ex G. Don Cirferri)*	Invasion of native plant communities by African Olive Olea europaea L. subsp. cuspidata (Wall ex G. Don Cirferri)	KTP
Threat	*Invasion of native plant communities by Chrysanthemoides monilifera*	Invasion of native plant communities by Chrysanthemoides monilifera	KTP
Threat	*Invasion of native plant communities by exotic perennial grasses*	Invasion of native plant communities by exotic perennial grasses	KTP
Threat	*Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW*	Invasion of the Yellow Crazy Ant, Anoplolepis gracilipes (Fr. Smith) into NSW	KTP

Threat	*Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)*	Invasion, establishment and spread of Lantana (Lantana camara L. sens. Lat)	KTP
Threat	*Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants*	Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	KTP
Threat	*Loss of Hollow-bearing Trees*	Loss of Hollow-bearing Trees	KTP
Threat	*Loss or degradation (or both) of sites used for hill-topping by butterflies*	Loss or degradation (or both) of sites used for hill-topping by butterflies	KTP
Threat	*Predation and hybridisation by Feral Dogs, Canis lupus familiaris*	Predation and hybridisation by Feral Dogs, Canis lupus familiaris	KTP
Threat	*Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)*	Predation by Gambusia holbrooki Girard, 1859 (Plague Minnow or Mosquito Fish)	KTP
Threat	*Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)*	Predation by the European Red Fox Vulpes Vulpes (Linnaeus, 1758)	KTP
Threat	*Predation by the Feral Cat Felis catus (Linnaeus, 1758)*	Predation by the Feral Cat Felis catus (Linnaeus, 1758)	KTP
Threat	*Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758*	Predation, habitat degradation, competition and disease transmission by Feral Pigs, Sus scrofa Linnaeus 1758	KTP

Threat	*Removal of dead wood and dead trees*	Removal of dead wood and dead trees	KTP

Search for NSW heritage

Return to search page where you can refine/broaden your search. ItemName 0

Statutory listed items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into two sections.

- **Section 1**. contains items listed by the **heritage council** under the NSW Heritage Act. This includes listing on the state heritage register, an interim heritage order or protected under section 136 of the NSW Heritage Act. This information is provided by the Heritage Branch.
- **Section 2**. contains items listed by **local councils & shires and state government agencies**. This section may also contain additional information on some of the items listed in the first section.

Section 1. Items listed under the NSW Heritage Act.

Your search returned 1 record.

Item name	Address	Suburb	LGA	Listed under Heritage Act
Gladesville Drill Hall	144 Ryde Road	Gladesville	Ryde	Yes

ItemName 0

Section 2. Items listed by Local Government and State Agencies.

Your search returned 33 records.

Item name	Address	Suburb	LGA	Information source
Avondale	76 Wharf Road	Gladesville	Ryde	LGOV
Banjo Paterson Park	38 Punt Road	Gladesville	Ryde	LGOV
Christ Church	220 Victoria Road	Gladesville	Ryde	LGOV
Clock	Wharf/Meriton Streets	Gladesville	Ryde	LGOV
Electricity Substation No. 129	38-42 Pitwater Road	Gladesville	Ryde	SGOV
Gates	220 Victoria Road	Gladesville	Ryde	LGOV
Gladesville Public School	172-180 Victoria Road	Gladesville	Ryde	LGOV
Great North Road	Bedlam Point To Eastwood	Ryde, Gladesville, Eastwood	Ryde	LGOV
House	10 Cambridge Street	Gladesville	Ryde	LGOV
House	8 Oates Avenue	Gladesville	Ryde	LGOV
House	10 Pelican Street	Gladesville	Ryde	LGOV
House	55 Wharf Road	Gladesville	Ryde	LGOV
House	19A Amiens Street	Gladesville	Ryde	LGOV
House	1-9 Monash Road	Gladesville	Ryde	LGOV

House	3 Tyrell Street	Gladesville	Ryde	LGOV
House	42 Tyrell Street	Gladesville	Ryde	LGOV
House	37 Wharf Road	Gladesville	Ryde	LGOV
House	310 Victoria Road	Gladesville	Ryde	LGOV
Houses	23-33 Amiens Street	Gladesville	Ryde	LGOV
Houses	43-45 Wharf Road	Gladesville	Ryde	LGOV
Houses	3, 17 & 19 Thompson Street	Gladesville	Ryde	LGOV
Monash Park Obelisk	142 Ryde Road	Gladesville	Ryde	LGOV
Monument, Glades Bay Park	45 Ashburn Place	Gladesville	Ryde	LGOV
Presbyterian Church	265A Victoria Road	Gladesville	Ryde	LGOV
Rock Engraving	Bedlam Point	Gladesville	Ryde	LGOV
Rock Engraving	Glades Bay Native Gardens	Gladesville	Ryde	LGOV
Rockend Cottage	38-40 Punt Road	Gladesville	Ryde	SGOV
Rockend Cottage	1 Punt Road, Bedlam Point	Gladesville	Ryde	LGOV
Substation	38-42 Pittwater Road	Gladesville	Ryde	LGOV
Tavern	170 Victoria Road	Gladesville	Ryde	LGOV
The Drill Hall Building 1	144 Ryde Street	Gladesville	Ryde	LGOV
Towalla	120 Pittwater Road	Gladesville	Ryde	LGOV
Wharf Remains	Bedlam Point	Gladesville	Ryde	LGOV

There was a total of 34 records matching your search criteria.

Key:
LGA = Local Government Area
GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.
Note: The Heritage Branch seeks to keep the State Heritage Inventory (SHI) up to date, however the latest listings in Local and Regional Evironmental Plans (LEPs and REPs) may not yet be included. Always check with the relevant local council or shire for the most recent listings.

Search Results

26 results found.

Addington 813 Victoria Rd	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Avondale 76 Wharf Rd	Gladesville, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Ben Lomond 37 Pennant Av	Denistone, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Bridge over Lane Cove River Ryde Rd	West Pymble, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)
Brush Farm House Lawson St	Eastwood, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Cottages Experimental Building Station Epping Rd	North Ryde, NSW, Australia	(Rejected Place) Register of the National Estate (Non-statutory archive)
Eastwood Fire Station 269 Rowe St	Eastwood, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Eastwood House (former) 40 Hillview Rd	Eastwood, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Gladesville Drill Hall (former) 144 Ryde Rd	Gladesville, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Gladesville Drill Hall (former) 144 Ryde Rd	Gladesville, NSW, Australia	(Ineligible Place) Commonwealth Heritage List

Hattons Cottage	158 Blaxland Rd	Ryde, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)
Linton	4 Linton Av	West Ryde, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Macquarie Hospital Bushland	Twin Rd	North Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Meadowbank Park Foreshore Wetland	Meadowbank Cr	Meadowbank, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Meadowbank Railway Bridge	Bowden St	Meadowbank, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Parramatta and Lane Cove Rivers Landscapes		Sydney, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Pennant Avenue Group	1-13 Pennant Av	Denistone, NSW, Australia	(Rejected Place) Register of the National Estate (Non-statutory archive)
Riverview House, Outbuildings and Garden	135 Marsden Rd	West Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Rockend	38-50 Punt Rd	Gladesville, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Rydale House (former)	Bellevue Av	West Ryde, NSW, Australia	(Destroyed) Register of the National Estate (Non-statutory archive)
Ryde Police Station (former)	808 Victoria Rd	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Ryde Public School 1877-1919 Buildings	Pope St	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Annes Anglican Church and Churchyard	42-46 Church St	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
The Hermitage and Garden	1 Pennant Av	Denistone, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Willandra	782 Victoria Rd	Ryde, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Wollondilly and Garden	13 Pennant Av	Denistone, NSW, Australia	(Removed from Register or IL) Register of the National Estate (Non-statutory archive)

Report Produced: Wed Oct 24 16:11:52 2012

APPENDIX D FLORA AND FAUNA LIST FOR BILL MITCHELL PARK AND GLADES BAY PARK

From Biosphere environmental Consultants (2008)
FLORA

NATIVE PLANT SPECIES LIST Glades Bay Park			
FAMILY	**SPECIES NAME**	**COMMON NAME**	**CS**
Pteridiophytes			
ADIANTACEAE	*Adiantum aethiopicum*	Maidenhair Fern	C
ASPLENICACEAE	*Asplenium australasicum*	Bird's Nest Fern	
BLECHNACEAE	*Doodia aspera*	Rasp Fern	S

DENNSTAEDTIACEAE	*Hypolepis muelleri*	Rough Ground Fern	S
	Pteridium esculentum	Bracken	C
DICKSONIACEAE	*Calochlaena dubia*	False Bracken Fern	C
PTERIDACEAE	*Pteris tremula*	Tender Brake	U
THELYPTERIDACEAE	*Christella dentata*		S
Gymnosperms			
CUPRESSACEAE	*#Callitris rhomboidea*	Port Jackson Cypress	
Angiosperms-Dicotyledons			
ACANTHACEAE	*Avicennia marina* var *australasica*	Grey Mangrove	C
APIACEAE	*Centella asiatica*	Centella	S
	Hydrocotyle peduncularis	Pennywort	C
ARACEAE	*#Alocasia brisbanensis*	Conjevoi	
ARALIACEAE	*Polyscias sambucifolia*	Elderberry Panax	C
ASTERACEAE	*Ozothamnus diosmifolius*	Paper Daisy	C
BIGNONIACEAE	*Pandorea pandorana*	Wonga Wonga Vine	C
CASUARINACEAE	*Allocasuarina littoralis*	Black She-Oak	C
	Casuarina glauca	Swamp She-Oak	C
CHENOPODIACEAE	*Einadia hastata*		S
CONVOLVULACEAE	*Dichondra repens (s.lat.)*	Kidney Weed	S
DILLENIACEAE	*Hibbertia aspera*	Rough Guinea Flower	C
	Hibbertia scandens	Golden Guinea Flower	R
ELAEOCARPACEAE	*Elaeocarpus reticulatus*	Blueberry Ash	C
EPACRIDACEAE	*Leucopogon juniperinus*	Prickly Heath	S
	Monotoca elliptica	Tree Broom Heath	S
EUPHORBIACEAE	*Breynia oblongifolia*	Coffee Bush	C
	Glochidion ferdinandi	Cheese Tree	C
	Homalanthus populifolius	Bleeding Heart	S
FABACEAE	*Acacia binervata*	Two-veined Hickory	R
	Acacia decurrens	Sydney Green Wattle	
	Acacia falcata		S
	Acacia floribunda	White Sallow Wattle	
	Acacia linifolia	Flax-leafed Wattle	C
	Acacia longifolia	Sydney Golden Wattle	C
	Acacia parramattensis	Parramatta Green Wattle	C
	Acacia ulicifolia	Prickly Moses	C
	Glycine microphylla		
	Hardenbergia violacea	False Sarsasparilla	C
	Kennedia rubicunda	Dusky Coral Pea	C
GERANIACEAE	*Geranium homeanum*	Northern Cranesbill	S
LAMIACEAE	*Clerodendrum tomentosum*	Hairy Clerodendrum	U
	Plectranthus parviflorus		U

LOBELIACEAE	*Pratia purpurascens*	White Root	C
MORACEAE	*Ficus coronata*	Sandpaper Fig	R
	Ficus rubiginosa	Port Jackson Fig	S
MYRSINACEAE	*Rapanea variabilis*	Mutton Wood	S
MYRTACEAE	*Acmena smithii (p)*	Lillypilly	U
	Angophora floribunda	Rough-barked Apple	S
	Callistemon citrinus	Crimson Bottlebrush	U
	Callistemon linearis	Narrow-leaved Bottlebrush	S
	#Eucalyptus botryoides	Bangalay	
	Eucalyptus pilularis	Blackbutt	S
	Kunzea ambigua	Tickbush	C
	Leptospermum polygalifolium ssp *polygalifolium*	Lemon-scented Tea-tree	C
	Melaleuca linariifolia	Snow-in Summer	S
	Melaleuca nodosa (p)	Ball Honeymyrtle	
	Melaleuca quinquenervia (p)	Broad-leafed Paperbark	
	Melaleuca stypheloides (p)	Prickly-leaved Paperbark	U
	Syncarpia glomulifera	Turpentine	S
	Tristaniopsis laurina (p)	Water Gum	C
OLEACEAE	*Notelaea longifolia*	Mock Olive	C
OXALIDACEAE	*#Oxalis perennans*		
PITTOSPORACEAE	*Bursaria spinosa*	Blackthorn	C
	Pittosporum undulatum	Sweet Pittosporum	C
POLYGONACEAE	*#Persicaria hydropiper*	White Pepper	
	#Persicaria lapathifolia	Knotweed	
PROTEACEAE	*Banksia integrifolia*	Coast Banksia	U
	Banksia serrata	Old Man Banksia	
	Grevillea buxifolia	Grey Spider Flower	C
	Grevillea linearifolia	White Spider Flower	C
	Grevillea sericea	Pink Spider Flower	C
	Hakea sericea	Bushy Needlebush	C
RUTACEAE	*Zieria smithii*	Sandfly Zieria	C
SAPINDACEAE	*Dodonaea triquetra*	Hop Bush	C
VITACEAE	*Cayratia clematidea*	Slender Grape	
Angiosperms-Monocotyledons			
ARECACEAE	*Livistona australis*	Cabbage-tree Palm	R
AGAVACEAE	*#Cordyline stricta?*	Narrow-leaf Palm Lily	
COMMELINACEAE	*Commelina cyanea*	Scurvy Weed	S
CYPERACEAE	*Bulboschoenus caldwellii*		S
	Lepidosperma laterale		C
JUNCACEAE	*#Juncus usitatus*		
LOMANDRACEAE	*Lomandra longifolia*	Mat Rush	C
PHILESIACEAE	*#Eustrephus latifolius*	Wombat Berry	
PHORMIACEAE	*Dianella caerulea*	Blue Flax Lily	C

POACEAE	*Austrostipa ramossissima*		
	Cymbopogon refractus	Barbed-wire Grass	S
	Dichelacne crinita	Long-haired Plume Grass	U
	Echinopogon caespitosus	Tufted Hedgehog Grass	C
	Entolasia marginata		S
	Entolasia stricta		C
	Eragrostis brownii	Brown's Love Grass	
	Imperata cylindrica var *major*	Blady Grass	C
	Lachnagrostis filiformis	Blown Grass	S
	Microlaena stipoides var. stipoides	Weeping Grass	C
	Oplismenus aemulus	Basket Grass	S
	Paspalidium distans		
	Poa affinis		
	Themeda australis	Kangaroo Grass	C
SMILACACEAE	*Smilax glyciphylla*	Native Sarsasparilla	C

SALTMARSH BEHIND 52 ROSS ST			
AIZOACEAE	*Tetragonia tetragonoides*	New Zealand Spinach	S
CHENOPODIACEAE	*Sarcocornia quinqueflora* ssp *quinqueflora*	Samphire	S
	Suaeda australis	Austral Seablite	U
JUNCACEAE	*Juncus kraussii* ssp *australiensis*	Sea Rush	S

SALTMARSH IN SOUTHERN CORNER			
AIZOACEAE	*Tetragonia tetragonoides*	New Zealand Spinach	S
AMARANTHACEAE	*Alternanthera denticulata*	Lesser Joyweed	C
CHENOPODIACEAE	*Sarcocornia quinqueflora* ssp *quinqueflora*	Samphire	S
	Suaeda australis	Austral Seablite	U
LOBELIACEAE	*Lobelia alata*		S
PRIMULACEAE	*Samolus repens*	Creeping Brookweed	C
CYPERACEAE	*Baumea juncea*		S
	Isolepis cernua	Nodding Club Rush	R
JUNCACEAE	*Juncus kraussii* ssp *australiensis*	Sea Rush	S
JUNCAGINACEAE	*Triglochin striata*	Streaked Arrow-Grass	U
POACEAE	*Sporobolis virginicus*	Sand Couch	S

EXOTIC AND NON-LOCAL NATIVE PLANTS GLADES BAY PARK		
FAMILY	**SPECIES NAME**	**COMMON NAME**
Pteridiophytes		
CYATHEACEAE	* *Cyathea cooperi*	Straw Treefern
DAVALLIACEAE	*Nephrolepis cordifolia*	Fishbone Fern
SINOPTERIDACEAE	*Pellaea viridis*	Cliffbrakes
Angiosperms-Dicotyledons		
AMARANTHACEAE	*Alternanthera pholoxeroides*[3]	Alligator Weed
ARACEAE	*Calocasia esculenta*	Taro
ASCLEPIADACEAE	*Araujia sericiflora*	Moth Plant

Glades Bay Park		
ASTERACEAE	*Aster subulatus*	Bushy Starwort
	Bidens pilosa	Cobbler's Pegs
	Conyza sp.	Fleabane
	Crassocephalum crepidioides	Thickheads
	Galinsoga parviflora	Potato Weed
	Gnaphalium sp.	Cudweed
	Hypochaeris radicata	Catsear
	Taraxacum officiale	Dandelion
	Senecio madagascariensis	Fireweed
	Sonchus oleraceus	Sowthistle
BASELLACEAE	*Anredera cordifolia*[4]	Madeira Vine
BIGNONIACEAE	*Jacaranda mimosifolia*	Jacaranda
CAPRIFOLIACEAE	*Lonicera japonica*	Honeysuckle
CARYOPHYLLACEAE	*Stellaria media*	Chickweed
CHENOPODIACEAE	*Atriplex prostrate*	
CRASSULACEAE	*Bryophyllum delagoense*	Mother-Of-Millions
EUPHOBIACEAE	*Euphorbia peplus*	Petty Spurge
	Phyllanthus tenellus	Long-stalked Phyllanthus
FABACEAE subfamily FABOIDEAE	*Erythrina X sykesii*	Coral Tree
	Genista monspessulana[3]	Cape Broom
	Medicago polymorpha	Burr Medic
FABACEAE subfamily MIMOSOIDEAE	*Acacia fimbriata*	Fringe-leaf Wattle
FUMARIACEAE	*Fumaria muralis ssp muralis*	Wall Fumitory
LAMIACEAE	*Stachys arvensis*	Stagger Weed
LAURACEAE	*Cinnamomum camphora*[4]	Camphor Laurel
MALVACEAE	*Malva parviflora*	Smallflower Mallow
MELIACEAE	**Melia azedarach* var *australasica*	White Cedar
MORACEAE	*Morus albus*	White Mulberry
MYRTACEAE	**Corymbia maculata*	Spotted Gum
	**Eucalyptus robusta*	Swamp Mahogany
	Lophostemon confertus	Brush Box
OCHNACEAE	*Ochna serrulata*[4]	Mickey Mouse Plant
OLEACEAE	*Ligustrum lucidum*[4]	Broad-leaved Privet
	Ligustrum sinense[4]	Small-leaved Privet
OXALIDACEAE	*Oxalis corniculata*	Yellow Wood Sorrel
	Oxalis purpurea	Large Flower Wood Sorrel
PASSIFLORACEAE	*Passiflora edulis*	Common Passionfruit
PLANTAGINACEAE	*Plantago lanceolata*	Lamb's Tongue
POLYGONACEAE	*Acetosa sagittata*	Turkey Rhubarb
ROSACEAE	*Rubus fruiticosis* species aggregate[4]	Blackberry
SAPINDACEAE	*Cardiospermum grandiflorum*[4]	Balloon Vine
SOLANACEAE	*Cestrum parqui*[3]	Green Cestrum
	Solanum nigrum	Blackberry Nightshade
STERCULACEAE	**Brachychiton acerifolius*	Illawarra Flame Tree
ULMACEAE	*Celtis occidentalis*	Hackberry
URTICACEAE	*Parietaria judaica*[4]	Sticky Weed
VERBENACEAE	*Lantana camara*[4]	Lantana
	Verbena sp	Purple Top

Angiosperms-Monocotyledons		
ASPARAGACEAE	*Asparagus aethiopicus*[4]	Asparagus Fern
COMMELINACEAE	*Tradescantia fluminensis*[4]	Trad, Wandering Jew
CYPERACEAE	*Cyperus eragrostis*	Umbrella Sedge
	Isolepis prolifer	
FABACEAE	*Castanospermum australe*	Black Bean
IRIDACEAE	*Watsonia meriana* cultivar *Bulbilliferea*	Wild Watsonia
LILIACEAE	*Chlorophytum comosum*	Ribbon Plant
JUNCACEAE	*Juncus cognatus*	
POACEAE	*Arundo donax*[4]	Giant Reed
	Briza minor	Shivery Grass
	Bromus catharticus	Prairie Grass
	Cynodon dactylon	Common Couch
	Digitaria didactyla	Queensland Blue Couch
	Digitaria sanguinalis	Summer Grass
	Echinochloa crus-galli	Barnyard Grass
	Ehrharta erecta	Ehrharta, Panic Veldtgrass
	Eragrostis curvula	African Lovegrass
	Paspalum dilatatum	Paspalum
	Paspalum urvillei	Vasey Grass
	Pennisetum clandestinum	Kikuyu
	Setaria sp.	Pigeon Grass
	Stenotaphrum secundatum	Buffalo Grass

*Indicates an Australian native species that is not indigenous to Ryde municipality
(p) Indicates a species that may have been planted
#Indicates a species not on Kubiak's (2005) plant list
Superscript numbers pertain to listed noxious weeds listed in the Weed Control Order No 19 (2005) of the Noxious Weeds Act 1993

FAUNA

Animal Group	Species	Common Name
Mammals	Brush-tail Possum	*Trichosurus vulpecula*
	Ring-tail Possum	*Pseudecheirus peregrinus*
	House Mouse *	*Mus musculus*
	Dog *	*Canis lupus familiaris*
	Rabbit *	*Oryctalagus cuniculus*
	Grey-headed Flying Fox	*Pteropus poliocephalus*
Birds	Pacific Black Duck	*Anas supercilliosa*
	White-faced Heron	*Ardea novaehollandiae*
	White Ibis	*Threskiornis aethiopica*
	Magpie Lark	*Grallina cyanoleuca*
	Masked Lapwing	*Vanellus miles*
	Sulphur-crested Cockatoo	*Cacatua galerita*
	Eastern Rosella	*Platycercus eximia*
	Crimson Rosella	*Platycercus elegans*
	Rainbow Lorikeet	*Trichoglossus haematodus*
	Fan-tailed Cuckoo	*Cacomantis flabelliformis*
	Koel	*Eudynamys scolopacea*
	Channel-billed Cuckoo	*Scythrops novaehollandiae*

	Tawny Frogmouth	*Podargus strigoides*
	Laughing Kookaburra	*Dacelo novaeguinea*
	Spotted Pardalote	*Pardalotus punctata*
	Brown Thornbill	*Acanthiza pusilla*
	Noisy Miner	*Manorina melanocephalus*
	New Holland Honeyeater	*Phylidonyris novaehollandiae*
	Eastern Spinebill	*Acanthorhynchus tenuirostris*
	Red Wattlebird	*Anthochaera carunculata*
	Willie Wagtail	*Rhipidura leucophrys*
	Black-faced Cuckoo Shrike	*Coracina novaehollandiae*
	Grey Butcherbird	*Cracticus torquatus*
	Australian Magpie	*Gymnorhina tibicen*
	Pied Currawong	*Strepera graculina*
	Australian Raven	*Corvus coronoides*
	Common Starling *	*Sturnus vulgaris*
	Common Myna *	*Acidotheres tristis*
	House Sparrow *	*Passer domestica*
	Spotted Turtle-dove *	*Streptopelia chinensis*
Reptiles	Garden Skink	*Lampropholis delicata*
	Grass Skink	*Lampropholis guichenoti*
	Weasel Skink	*Saproscincus mustelinus*
	Eastern Water Skink	*Eulamprus quoyii*
Frogs	Common Eastern Froglet	*Crinia signifera*
Fish	Nil	

APPENDIX E ABORIGINAL & EUROPEAN HERITAGE ASSESSMENT STATEMENT

Aboriginal and European Archaeological Heritage Impact Statement

Ryde Riverwalk, Gladesville, NSW

Bill Mitchell Park, Glades Bay Park & Looking Glass Bay Park

Report to

City of Ryde

Dominic Steele Consulting Archaeology

6 November 2012

Report Contents

Report Contents (Cont)

Dominic Steele Consulting Archaeology
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1.0 Introduction

1.1 Background to this Report

The *City of Ryde* (Council) proposes to formalise approximately 2km of existing informal trails along the northern edges of Parramatta River at Bill Mitchell Park, Glades Bay Park and Looking Glass Bay Park in Gladesville as part of the *Ryde Riverwalk*. A *Review of Environmental Factors* (REF) is being prepared to assess the preferred location, design and construction options that have been developed through preliminary planning for the proposal.

This *Aboriginal and European Archaeological Heritage Impact Statement* (AHIS) has been prepared in consultation with the *Metropolitan Local Aboriginal Land Council* (MLALC) to inform the REF about potential archaeological heritage constraints that may exist for the proposal, and to guide how the planned river foreshore connections at these parklands can be achieved with no adverse archaeological heritage impacts.

1.2 The Ryde Riverwalk Proposal

The following report draws upon the principal findings and conclusions previously presented in an *Archaeological Management Plan* (AMP) prepared for Council in January 2012 during preliminary planning for the project. The concept design plans presented here as **Figures 1.1** to **1.4** have been developed by Council following detailed preliminary planning and analysis for the proposal, and these are addressed in this AHIS.

1.3 Heritage Context and Controls

This report has been prepared with reference to the primary legislation that provide statutory protection for Aboriginal and non-Aboriginal (European) heritage and the requirements for its management in New South Wales:

- The *National Parks and Wildlife Act 1974* (as amended);
- The *NSW Heritage Act 1977* (as amended); and
- The *Environmental Planning and Assessment Act 1979* (as amended).

1.4 Heritage Assessment Methodology

This AHIS has been prepared in accordance with best-practice heritage assessment and management guidelines and standards endorsed by the *NSW Office of Environment and Heritage* (OEH) and the *NSW Heritage Council* as referenced in the bibliography.

The following heritage registers and lists have been reviewed for the current *Ryde Riverwalk* project REF. Allied non-statutory (community) heritage schedules have also been reviewed.

- NSW Office of Environment & Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS) Sites Register.
- NSW Heritage Council – State Heritage Register & State Heritage Inventory.
- Ryde Local Environmental Plan (LEP) 2003 (105), LEP 2010, and Draft LEP 2011 (Schedule 5 – Environmental Heritage, Part 1 – Heritage Items).
- Sydney Regional Environmental Plan 2005 (Sydney Harbour Catchment) Schedule 4.
- Sydney Water Section 170 Heritage & Conservation Register.
- NSW Roads and Maritime Authority Section 170 Heritage & Conservation Register.
- Sydney Harbour Foreshore Authority Section 170 Heritage & Conservation Register.

Key heritage documents that have been consulted with in preparing this AHIS are identified in the bibliography to this report and are supported by research compiled within the January 2012 project AMP.

A series of inspections of the three parklands and their surrounds have been undertaken in preparing this AHIS. These site surveys have been matched with the concept plans that have been developed for the proposal and which are evaluated here.

1.5 Report Outline

This AHIS presents the following.

- An introduction to the *Ryde Riverwalk* proposal (**Section 1.0**).
- A description of existing Aboriginal and European cultural heritage sites and their contexts within the three parklands relative to the preferred design options of the proposed *Riverwalk* improvement proposal (**Section 2.0**).
- An evaluation of the potential heritage risks that have been identified for the proposal and the ways these potential heritage constraints can be avoided, or at best, mitigated to an acceptable level (**Section 3.0**).
- Key heritage management recommendations that have been developed to inform the REF to guide the *Ryde Riverwalk* proposal (**Section 4.0**).

Figure 1.1: Ryde Riverwalk Landscape Master Plan.

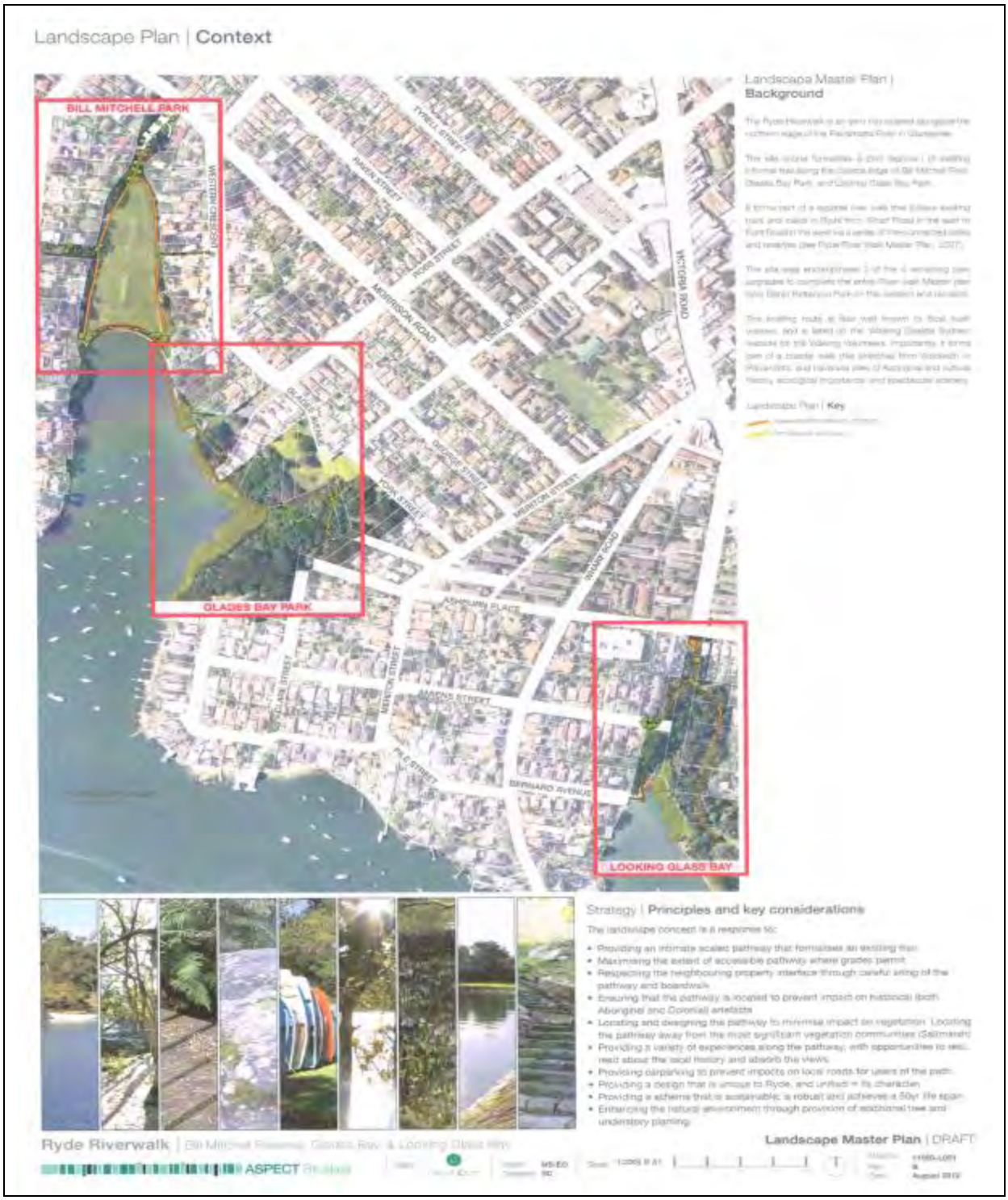


Figure 1.2: Ryde Riverwalk Landscape Master Plan – Bill Mitchell Park.

Figure 1.3: Ryde Riverwalk Landscape Master Plan – Glades Bay Park.

Figure 1.4: Ryde Riverwalk Landscape Master Plan – Looking Glass Bay Park.


Landscape Plan | Looking Glass Bay
SECTION 05
SECTION 04
PERSPECTIVE
Landscape Plan | Context
Ryde Riverwalk
ASPECT
Landscape Master Plan

2.0 Aboriginal and European Heritage Sites

2.1 Aboriginal Cultural Heritage Sites in Glades Bay and Looking Glass Bay

The following Aboriginal cultural heritage sites occur in Glades Bay. The first three are located along the eastern side of Bill Mitchell Park to the north of the sandstone seawall constructed during reclamation works in c.1938 for the creation of this parkland. The fourth site occurs close to the water below the end of Ross Street between the seawall and Glades Bay Park. The remaining three sites are located within the bush land of Glades Bay Park further to the south:

- Bill Mitchell Park 1 (AHO Site #216) OEH #45-6-1924 Shelter with Art.
- Bill Mitchell Park 2 (AHO Site #217) OEH #45-6-1927 Shelter with Midden.
- Bill Mitchell Park 3 (AHO Site #218) OEH #45-6-1923 Shelter with Midden.
- Bill Mitchell Park 5 (AHO Site #220) OEH #45-6-1925 Shelter with Midden.
- Glades Bay 1 (AHO Site #222) OEH #45-6-0531 Open Midden.
- Glades Bay 2 (AHO Site #223) OEH #45-6-0609 Rock Engravings.
- Glades Bay 3 (AHO Site #224) OEH #45-6-2321 Grinding Grooves.

A number of other Aboriginal heritage sites occur around the edges of Looking Glass Bay. None of these sites will be affected by the proposed *Ryde Riverwalk*.

2.2 Aboriginal Heritage Site Descriptions

2.2.1 Bill Mitchell Park 1 (AHO Site #216)

This small sandstone overhang was first recorded in 1990. The site recording at the time described a faint white hand stencil was present on the rear wall of the shelter. The Aboriginal Heritage Office (AHO) has prepared an updated condition assessment for this site. No archaeological deposit is presently visible on the floor of the overhang, and while there are indications of previous fire-use in the shelter, the hand stencil recorded in 1990 is not currently visible.

The publically accessible context of the site present challenges to its ongoing protection and management.

Views of this shelter and its surrounding sandstone features (rock-falls and boulders) illustrate its context relative to the residential properties that adjoin the eastern side of Bill Mitchell Park are provided by **Figures 2.1** and **2.2**.

2.2.2 Bill Mitchell Park 2 (AHO Site #217)

This now modified overhang was also first recorded in 1990. The site recording prepared at that time reported the presence of no art, with the floor deposit including archaeological shell midden with rock oyster and hairy mussel.

Terraced gardens have now overrun the shelter. The sandstone element would have once been longer, but is now reduced to little more than 2m in length. No evidence for shell midden material is presently visible.

Indicative views of the context of this site relative to the surrounding landscaped sandstone elements that are present along the eastern side of this portion of Bill Mitchell Park is illustrated in **Figures 2.3** and **2.4**.

2.2.3 Bill Mitchell Park 3 (AHO Site #218)

This modified overhang is the third of the three recorded in 1990 and is also situated along the eastern side of Bill Mitchell Park to the north of the seawall. The site recording prepared at that time indicated it had been already incorporated into a terraced garden feature with midden materials of rock oyster and cockle still visible. Shell midden is still visible, but only in a shelf within the shelter and as minor remnant pieces mixed and broken on the floor of the overhang and in surrounding garden contexts. Recent landscaping and vegetation maintenance has disturbed or removed any pre-existing Aboriginal archaeological deposits outside of where materials are currently visible.

An indicative view of the context of this overhang and the surrounding landscaped sandstone elements of which it forms a part in this portion of Bill Mitchell Park near the seawall is illustrated in **Figure 2.5**.

2.2.4 Bill Mitchell Park 5 (AHO Site #220)

This site is situated between Bill Mitchell and Glades Bay Parks to the south of the seawall and occurs close to the waterline below Ross Street. It was first recorded in 1990.

Indicative views of this locality are provided by Figures **2.6** to **2.8**. The first of these is looking north (at low tide) over exposed sandstone platforms towards the grassed Ross Street Reserve. The dingy rack to the right (presumably in the same location from at least 1990) has been established on the surface of now largely grassed over shell midden deposits. Shells also occur in places in exposures beneath the grass and overlying the sandstone shelves in the foreground of this photograph.

The second photograph looks past the dinghy rack to the existing dirt track that leads to the base of the timber steps leading down from Ross Street. Midden deposits occur on both sides of this track. Shell midden materials are also currently exposed around the base of an interpretive panel near the base of the Ross Street steps, and the adjacent sandstone cliff face.

The third image provides a view looking towards the mangroves at the waterline on the eastern side of Glades Bay. What appear to be the remains of a c.1909 set of sandstone steps and a low seawall associated with the former Glades Bay Baths occur in the background of this photograph.

The AHO have prepared a detailed recording of this site. **Figure 2.9** presents illustrations of the site and its context recently documented by the AHO.

The nature, location, and context of this Aboriginal heritage site present a number of challenges to its effective protection now and its ongoing management. The site consists of a small modified sandstone overhang that forms a part of a larger rock face that contains remnant archaeological deposits and evidence of fire-blackening from past Aboriginal use, with midden deposits occurring in front of the cliff that extends down towards the waterline. These archaeological materials are presently covered by grass and other foreshore vegetation, but have been disturbed in the past by the placement of the dingy rack, the nearby interpretation panel and Ross Street steps and foot track, and the early twentieth century steps and stone wall at the tide-line of the river foreshore.

These elements of the site occur within a confined space and have a number of physical and public use constraints that pose direct threats to the ongoing preservation of the site. At present, public access to the water and dingy rack in this location are from the Ross Street steps and from Bill Mitchell Park (via the seawall) and Glades Bay Park to the northwest and southeast respectively.

2.2.5 Glades Bay 1 (AHO Site #222)

This open midden is located on the alignment of the current Waluba Track in the vicinity of a creek (with a small 'waterfall' feature and a timber crossing nearby) and interpretive sign. The site has been recorded a number of times since 1985. The AHO have prepared a recent detailed survey of the site and an up to date condition assessment.

Two views of the general location and context of this site are provided by **Figures 2.10** and **2.11**. Shell midden deposits are partly exposed below the grass cover illustrated over the sandstone shelf nearby to the interpretive sign in the background of these images.

2.2.6 Glades Bay 2 (AHO Site #223)

The description of the Glades Bay Aboriginal rock engravings as it was published in 1941 is provided below. The site plan that accompanied the published descriptions is reproduced here as **Figure 2.12**. Indicative views of the site are provided by **Figures 2.13** and **2.14**.

> *'Site: This group is situated beside a creek flowing into the head of Glade's Bay, Tennyson, Parramatta River. It is the only one which bears engravings of a number of sloping rock surfaces at the site, which must have formed an excellent camping place for the aborigines. The figures are on two rocks, both of which are undulating and slope in line with the ground. This is the only group of engravings known along the Parramatta River.*
>
> *Description (left to right): two opossums, a man (object in hand unidentifiable), a large fish, a shield, a mammal (?), native water-rat, 2 wallabies, a boomerang, and part of a fish (?).*
>
> *Technique and State of Preservation: The outlines are smoothed grooves, some of which are very weathered and indistinct. Those of the two wallabies are very distinct, being ¾ in. Wide and ½ in. Deep. Vandals have altered some of the outlines.*
>
> *Interpretation: The man may be holding a weapon or scared object and may be connected with the two opossums. The other figures may be a record of game frequenting the vicinity'.*

The AHO have prepared an updated condition assessment for this site which includes a supplemental (NPWS) AHIMS record that states:

> *'Jan. 14 1973 Mr. Gilbert Jones wrote – could only see carvings of the 2 wallabies – believes other engravings may be silted + overgrown or possibly destroyed by vandals – Remaining carvings have initials carved close to them + some wilful damage has been done to the carvings themselves'.*

The AHO 2010 condition assessment also provides comments regarding future management of the engravings and their surrounding context including the removal of some of the overhanging branches that may currently be damaging the rock surfaces at the site and suggest an attempt should be made to locate some of the other engraved images originally recorded by McCarthy in 1941 that are now no longer evident.

2.2.7 Glades Bay 3 (AHO Site #224)

The axe grinding grooves were first recorded in 1991. They currently form part of the Waluba Track and feature a timber viewing deck and information signs as illustrated in **Figures 2.15** and **2.16**.

The AHO have prepared an updated condition assessment report and description for the site. It includes eight grinding grooves associated with a rock pool, and some of these are shallow and faint. Graffiti recorded in 1991 including engraved initials ('S D') and a small sailing boat is still visible, but no new graffiti and/or other obvious sign of disturbance to the site are apparent.

2.3 Potential European Heritage Items in Glades Bay

Three (built) European items at Glades Bay are identified here for consideration for the project REF. Neither of these items is listed on any heritage schedule or list. They comprise the following:

- Sandstone remains of the c.1090 Glades Bay Baths.
- The 1930s Bill Mitchell Park Seawall.
- The sandstone entry steps to Bill Mitchell Park.

2.4 European Item Descriptions

2.4.1 Glades Bay Baths

The open swimming baths at Glades Bay were built by Council at the bottom of Ross Street in c.1909. Remains of a set of sandstone steps and a small seawall that is incorporated into natural rock platforms that may be associated with this swimming enclosure occur at the waterline immediately adjacent to the Aboriginal heritage site (Bill Mitchell Park 5 – AHO #220) previously described.

Little information has been sourced for the history of the original baths before they were closed in the 1930s because of disrepair, damage, and bacteriological pollution. By 1940, Council had removed the buildings at the baths above high water mark but did not have sufficient funds available for any other work because '*funds are being used temporarily on unemployment works*' (Blaxell 2006). The baths appear to have functioned (at least officially) off and on until the facility ultimately closed sometime during 1962. Two views of the Glades Bay Baths at the end of Ross Street from dating the early 1950s are presented here in **Figure 2.17**. Indicative views of the sandstone steps, its associated low seawall, and surrounding rock platforms that are at the waterline of Parramatta River in Glades Bay below Ross Street are provided by **Figures 2.18** to **2.21**.

2.4.2 Bill Mitchell Seawall and Sandstone Step Entry Points to Bill Mitchell Park

Indicative views of the c.1938 sandstone seawall that defines Bill Mitchell Park are presented in **Figures 2.22 and 2.23**. This seawall is a typical early to mid-twentieth century example of most that were constructed around Sydney during the period and associated with reclamation of foreshores around bays. The seawall is comparable in date, design, construction technique, and historical context with those also constructed nearby through civil works undertaken by Council to create foreshore parkland.

Possible use of the existing Brett Street and Western Crescent sandstone steps to provide improved access options to Bill Mitchell Park are being considered as part of the project. There are indications these steps (or their alignments from the residential streetscapes above) were in place by the early 1940s. It is unclear whether they are related to the seawall construction period of civil works undertaken to create the parkland at the head of Glades Bay, and/or were later 1960s additions forming a part of housing construction development that occurred during this time.

Figure 2.1: Bill Mitchell Park 1 - AHO Site #216 (Source: DSCA 2011).

Figure 2.2: Bill Mitchell Park 1 - AHO Site #216 (Source: DSCA 2011).

Figure 2.3: Bill Mitchell Park 2 - AHO Site #217 (Source: DSCA 2011).

Figure 2.4: Bill Mitchell Park 2 - AHO Site #217 (Source: DSCA 2011).

Figure 2.5: An Indicative View Towards Bill Mitchell Park 3 - AHO Site #218 – and the Seawall Looking South (Source: DSCA 2011).

Figure 2.6: An Indicative View Towards Bill Mitchell Park 5 - AHO Site #220 – Looking South to the Ross Street Reserve (Source: DSCA 2011).

Figure 2.7: An Indicative View Towards Bill Mitchell Park 5 - AHO Site #220 – Looking South up towards the Ross Street Steps (Source: DSCA 2011).

Figure 2.8: An Indicative View of Bill Mitchell Park 5 - AHO Site #220 – Looking South to the Water and the Fringing Mangroves (Source: DSCA 2011).

Figure 2.9: Detailed Recording of Bill Mitchell Park 5 - AHO Site #220 (Source: AHO 2011).

Surface of the Site Looking West

Surface of the Site Looking East

Small Overhang in Cliff Line with Blackening

Profile of Midden below Sandstone Blocks

Figure 2.10: Indicative View of Glades Bay 1 - AHO Site #222 (Source: DSCA 2011).

Figure 2.11: Indicative View of Glades Bay 1 - AHO Site #222 (Source: DSCA 2011).

Figure 2.12: Glades Bay Rock Engravings – 1941 Site Plan - AHO Site #223 (Source: Mankind 1941).

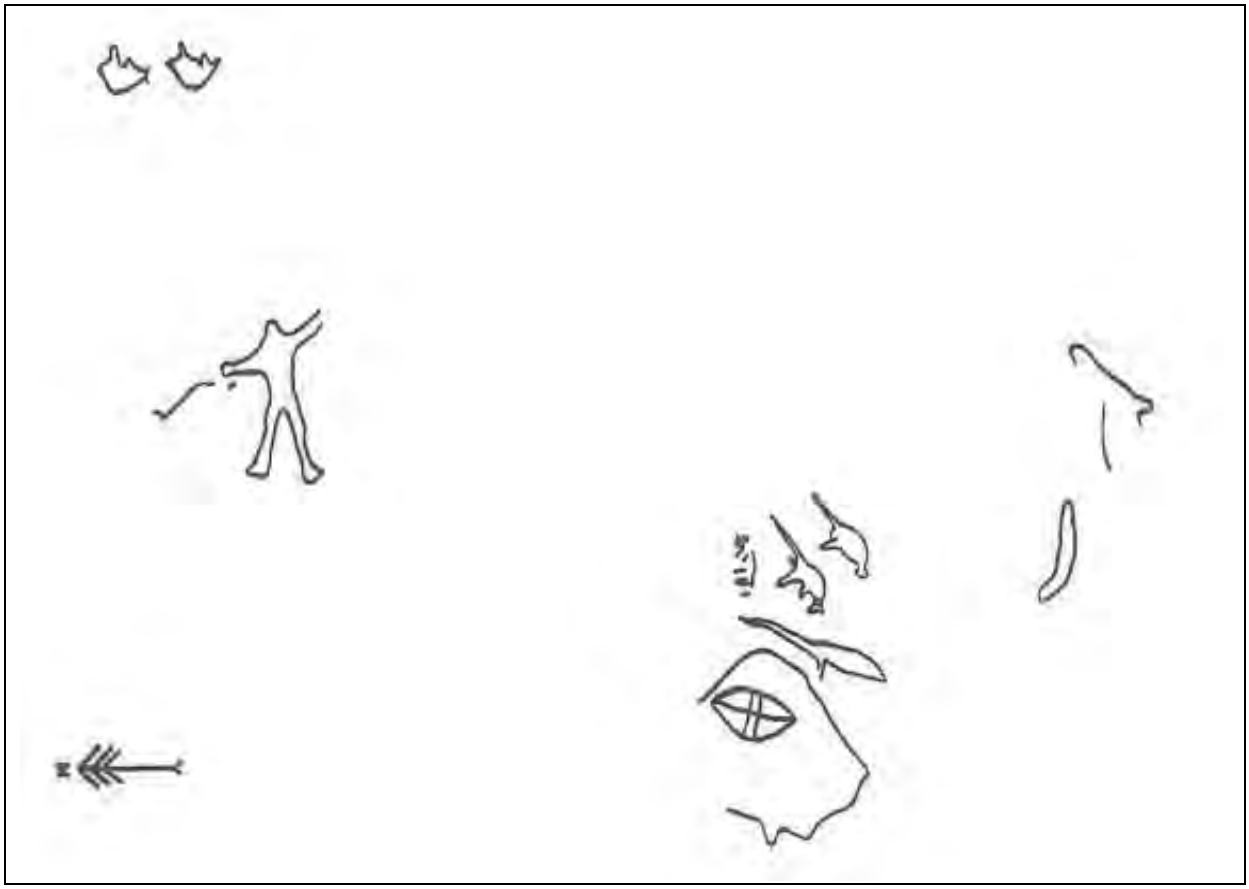


Figure 2.13: Viewing Deck & Signage at the Glades Bay Park Rock Engravings (Source: DSCA 2011).

Figure 2.14: Viewing Deck & Signage at the Glades Bay Park Rock Engravings (Source: DSCA 2011).

Figure 2.15: Axe Grinding Groove Site - AHO Site #223 (Source: DSCA 2011).

Figure 2.16: Axe Grinding Groove Site - AHO Site #224 (Source: DSCA 2011).

Figure 2.17: Two Views of Glades Bay Baths at the end of Ross Street in c.1952 and 1953 (Source: City Of Ryde Library).

Figure 2.18: Sandstone Steps and Seawall Looking North (Source: DSCA 2011).

Figure 2.19: Sandstone Steps and Seawall Looking South (Source: DSCA 2011).

Figure 2.20: Detail of the Sandstone Seawall Looking East (Source: DSCA 2011).

Figure 2.21: Sandstone Steps, Seawall and Rock Platforms Looking North (Source: DSCA 2011).

Figure 2.22: Sandstone Seawall at Bill Mitchell Park Looking North (Source: DSCA 2011).

Figure 2.23: Sandstone Seawall at Bill Mitchell Park Looking South (Source: DSCA 2011).

3.0 Heritage Site Management Options and Actions

3.1 Existing Threats to the Aboriginal Heritage Sites in Glades Bay

The sandstone elements that define the edge of the recreational field in Bill Mitchell Park back directly onto private property and have been incorporated within landscape garden terracing since the 1990s. The detrimental effects these activities have had on the archaeological sites here cannot be reversed. However, in a practical sense, the sandstone garden border walls facing into the park have served to 'stabilise' to some extent the shell midden deposits that may still survive behind them, and have also created some physical restrictions to access of areas below the overhangs that will have been more available prior to c.1990.

The updated condition assessments for these sites prepared by the AHO in 2010 provide a baseline from which future monitoring and site-specific management actions can be implemented to stop further garden landscaping activities occurring that have overrun these sites.

The archaeological deposits at Bill Mitchell Park 5 within the Ross Street Reserve (RSR) have been disturbed by a number of activities including the placement of the boat storage rack on the midden in c.1999, the installation of a nearby interpretation panel in c.2003, the construction of the Ross Street steps, and the creation of the Glades Bay Bath's stone steps and seawall at the tide-line. Ongoing use of the foot track that extends from base of the steps to the dingy rack and water at the RSR continues to affect the preservation of this archaeological site.

The shell midden on the alignment of the Waluba Track in Glades Bay is exposed in places, and appears to extend beneath grass cover fringing the foot track to an unknown extent. Since the 1980s, pedestrian use of the foreshore track in this locality has been recognised as an ongoing threat to the survival of this Aboriginal heritage site.

A number of changes to the site conditions at the most widely known Aboriginal heritage site on the Waluba Track (the Glades bay Park rock engravings) are apparent since the place was first recorded and published in 1941. The changes that can be most readily seen include:

- Only three of the eleven engraved figures/motifs first recorded are now visible. The remaining engravings, if they survive (which is probable), are currently obscured by vegetation growth which now surrounds and partly covers the engraved sandstone platforms.

- The outlines of the two wallaby images may have been purposively re-grooved since 1941. The original records are however insufficiently detailed to determine precisely whether this has been the case without detailed re-recording of the site as a whole.
- The outline of the human figure at the site has been highlighted recently. It is not known precisely when this occurred.
- The installation of a steel post and chain link fence, along with a brass plaque in 1947, has disturbed parts of the rock platform upon which the engravings are located. This has included the insertion of posts directly into the rock, and the cutting out of a rectangular rock-niche for the placement of the sign. Although the fence supports have since been removed, their bases remain and they are unsympathetic and obtrusive fabric elements.
- Vegetation conditions at the site have changed repeatedly. This has occurred a broad level since the 1930s (and no doubt well before that time), and a number of changes in vegetation cover are also evident since the creation of the Waluba Track in the early 2000's.
- Natural processes of wind and rain have weathered the engravings. It is likely current unmanaged vegetation cover is also affecting natural drainage flows and water run-off over the rock platforms that are contributing to the erosion of the engravings.
- The existing timber viewing platforms have encroached upon the engraving site. They provide access to the wallaby engravings which is gained by visitors stepping over and/or onto the human figure engraving that is present on a separate rock outcrop nearby. Currently, the timber decks are in good condition and are largely unobtrusive in their general setting within the parkland. These platforms however will naturally degrade in the future and will need to be repaired, replaced, and/or removed which will have some level of impact upon the site.

The axe grinding grooves nearby to the rock engravings currently feature a timber viewing deck and information signs. Some of the grooves are presently obscured by uncontrolled lichen growth, and the education signs at the site are in poor condition and in need of replacement. No new graffiti and/or other obvious signs of disturbance to the site since 1991 are currently evident.

3.2 Potential Heritage Threats of the Proposed Riverwalk Project

3.2.1 Bill Mitchell Park

The existing concrete paths in Bill Mitchell Park have been constructed at ground level and on the alignment of walkways that have been in this configuration since at least 1961. Following the current

path pattern with upgraded walkways will therefore not alter the existing recreational layout and use structure of the park.

No direct impacts to the rock overhangs with Aboriginal archaeology along the eastern side of the park will occur as a result of the creation of the new walkways. The sandstone formations are set back on the edge of the playing field, and any potential indirect impacts during future construction activities can be prevented. The AHO and MLALC have provided Council with standard procedures and protocols on how effective site management levels can be established and maintained during works programs undertaken within the vicinity of known Aboriginal heritage sites.

It is expected future works in the playing fields will encounter reclamation fill dating to c.1938-1943. It is likely the depths of these fills below current grassed surfaces will be considerable. There is little chance of intact Aboriginal archaeological deposits to be exposed (at least immediately) below ground levels. The proposed new paths would be constructed at current ground level and/or just below it and will extend into underlying fill materials of low archaeological sensitivity to a shallow depth.

The proposed upgrades in the park will also allow for the relocation of existing and/or the placement of new spectator/visitor park benches and other facilities (such as rubbish bins) away from the immediate vicinity of the sandstone elements that contain Aboriginal archaeology. Repositioning of benches, rubbish bins, and other 'fixed' park furniture to passively discourage visitors from using the rock overhangs as convenient play areas and as garbage disposal points will assist in the ongoing protection of these Aboriginal heritage sites in the park.

Opportunities exist to augment the current heritage signage within the context of the proposed *Riverwalk* project. The MLALC and AHO have advised on how signs can be placed without specifically pointing out where sensitive heritage sites are located and what kind of messages they should convey to visitors. New signage could be created that explains how Glades Bay has changed over time and how some Aboriginal sites have survived these changes. This could be conveyed positively, and could reinforce the message that the sites we have today are important and why their protection and conservation is a shared community responsibility.

No significant heritage constraints have been identified for the proposed use of the Bill Mitchell Park sandstone seawall, or the existing Brett Street and Western Crescent steps to provide improved access options to the park as part of the *Riverwalk* proposal.

3.2.2 Ross Street Reserve

The proposal to create new boardwalk facilities between the Bill Mitchell Park seawall and the Ross Street steps have been designed to mitigate direct impacts to Bill Mitchell Park 5 (AHO Site #220) and the Glades Bay Bath's stone steps and retaining wall at the waterline. Detail design plans that have been developed for this locality are provided in **Figure 3.1** and **3.2**.

However, future activities in the RSR for the creation of a boardwalk connecting Bill Mitchell Park with Glades Bay Park along the foreshore, and which may impact to some degree on the Aboriginal archaeological and cultural heritage values at the place, include:

- The upgrade of the Ross Street steps.
- Formalisation of the existing pedestrian track at the base of the steps which leads to the dingy rack and waterline.
- The creation of a boardwalk from the southern end of the elevated platform over the river to the sandstone steps at the waterline.
- Vegetation clearance within the RSR in general, and around the sandstone cliff face and overhang in particular.
- The transportation and placement (temporary storage) of construction equipment and material for the proposed boardwalk, mindful that feasible options to establish a work site in this location would be restricted to either the waterside and/or via Ross Street.

A site-specific *Heritage Impact Statement* (HIS) would need to be prepared for the RSR when design and construction options for this component of the *Riverwalk* proposal are confirmed. The HIS would be developed in consultation with the MLALC and would identify adequate levels of heritage site protection and appropriate conservation and management approaches. The HIS would also identify the need for an *Aboriginal Heritage Impact Permit* (AHIP) to be sought from the OEH to guide future works in the RSR.

3.2.3 Glades Bay Park Foreshore

The precise extent of the open shell midden located on the alignment of the Waluba Track in Glades Bay (Glades Bay 1 - AHO Site #222) in the vicinity of the creek (with a small 'waterfall' and timber crossing nearby) to the southwest of the main engraving site is currently unknown. Activities for the creation of a raised boardwalk along the unformed path (or nearby) in this locality have the potential to disturb this archaeological site from future works including:

- Excavation for the installation of supporting piers for the boardwalk.
- Vegetation clearance around future construction/activity areas.
- The replacement/relocation of interpretive signage along the Waluba Track.
- The transportation and storage of construction equipment & materials.

A locality specific HIS would need to be prepared when design and construction options for the *Riverwalk* proposal are confirmed. The HIS would be prepared in consultation with the MLALC and would establish whether future works are likely to impact upon archaeological deposits, and if so, how these could be avoided and/or appropriately mitigated. Potential heritage management options and actions may include:

- Targeted archaeological test excavation (with an approved OEH AHIP) in planned pier hole locations to establish the presence or absence of midden materials in order to accurately map these occurrences to a level that cannot be achieved by field inspection alone. This would identify where the boardwalk alignment could be created with no foreseeable Aboriginal heritage constraints.
- The results of these procedures would guide both the development of the foreshore boardwalk in this location, and provide detailed information for the future management of the Aboriginal heritage site and its surrounding landscape context in the parkland.

While no other identified Aboriginal heritage constraints are apparent in this locality at this time, it is likely the HIS will also need to extend to include plans to modify the existing conditions at the creek and to clear any vegetation given the potential for these types of activities to expose sandstone surfaces that may possess as yet undetected engravings or axe grinding grooves.

3.2.3 Glades Bay Park Aboriginal Rock Engraving & Axe Grinding Groove Sites

A site-specific *Heritage Impact Statement* (HIS) would need to be prepared for the modification to the existing sandstone and timber access points, and what are elsewhere currently informal tracks, to the south and north of the main engraving site. Future vegetation clearance in these areas may expose sandstone surfaces that have the potential to possess previously unrecorded engravings and axe grinding grooves.

Finally, some of the heritage and environmental signage along the Waluba Track may be considered for replacement as part of the project. The information panels at the axe grinding groove site and the northern entry to Glades Bay Park in particular are presently in poor condition.

3.4 Looking Glass Bay

No documented Aboriginal or European heritage sites are located within the locations in the park that are proposed to construct new walkway facilities. In addition, no specific areas of potential Aboriginal or European archaeological sensitivity have been identified in the areas that are proposed to formalise current informal pedestrian tracks in Looking Glass Bay to connect with the established shared paths in Banjo Paterson Park.

Figure 3.1: Ryde Riverwalk Landscape Master Plan – Detail Design at Glass Bay Park.

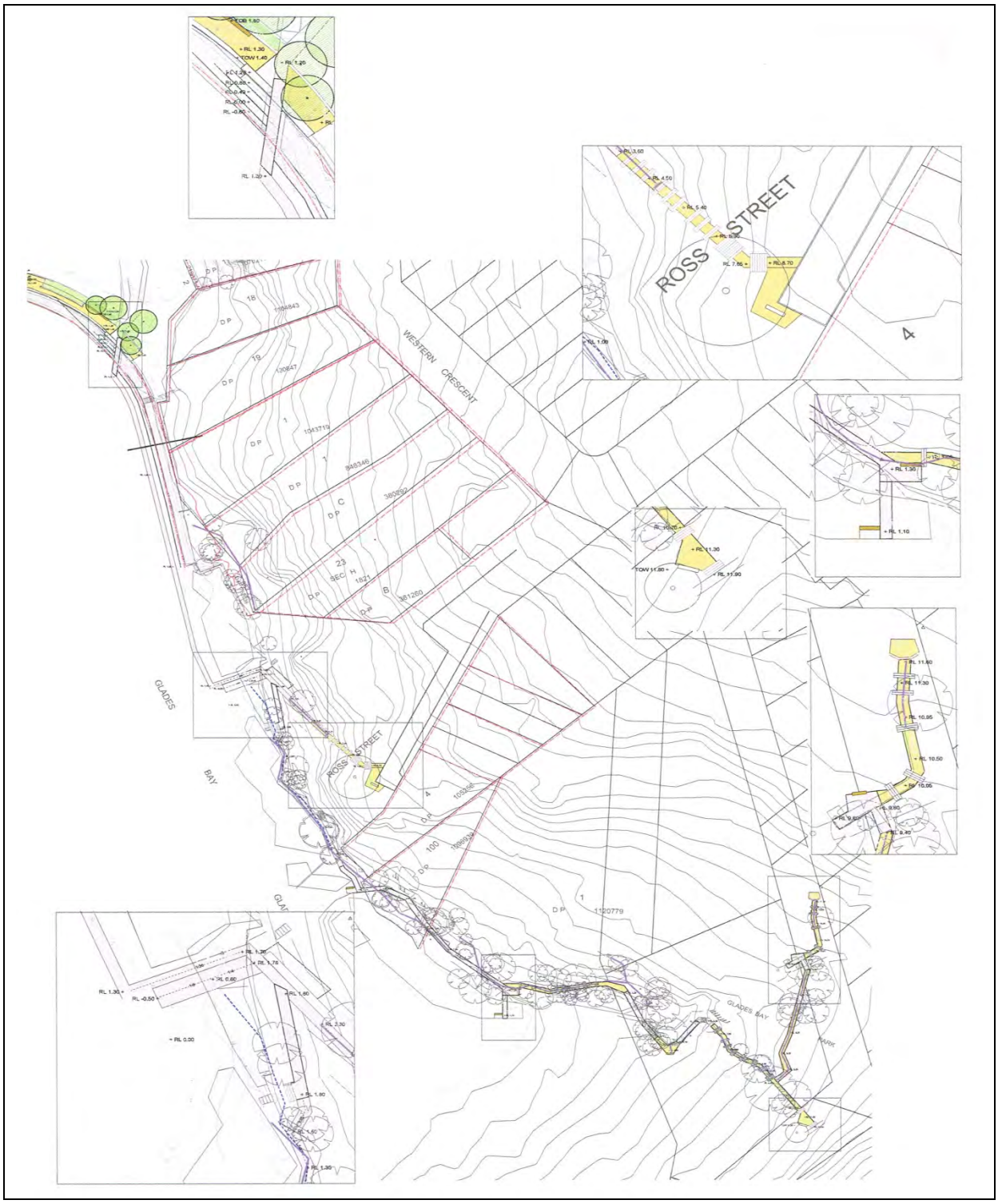
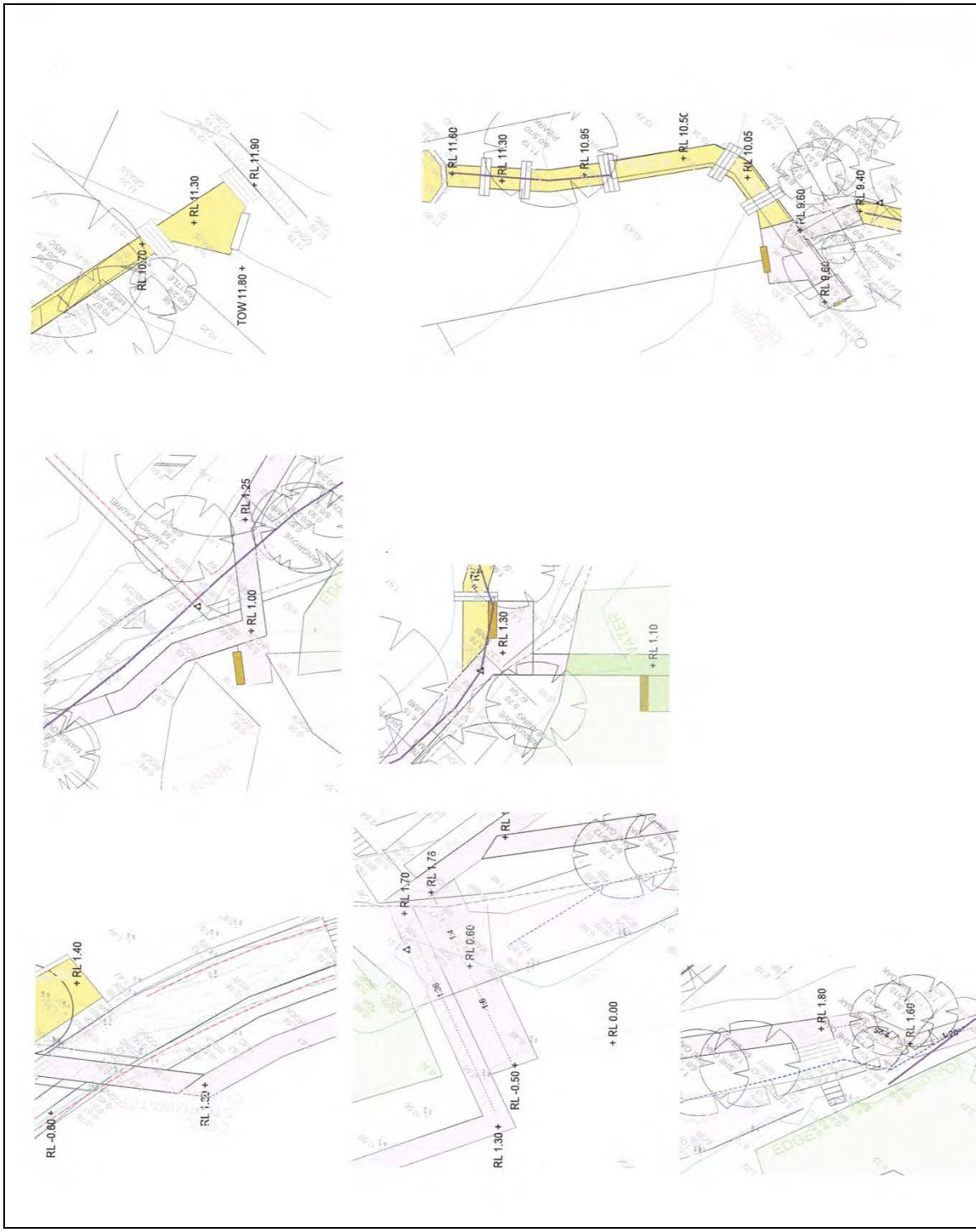


Figure 3.2: Ryde Riverwalk Landscape Master Plan – Detail Design at Ross Street.


+ RL 11.30
+ RL 11.90
RL 10.70 +
TOW 11.80 +
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+ RL 9.40
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+ RL 9.60
+ RL 1.25
+ RL 1.00
+ RL 1.30
+ RL 1.10
+ RL 1.70
+ RL 1.78
+ RL 0.60
+ RL 0.00
RL -0.50 +
RL 1.30 +
+ RL 1.40
RL -0.80 +
+ RL 1.80
+ RL 1.60

4.0 Conclusions & Heritage Management Recommendations

4.1 Potential Heritage Impacts of the Proposal & Mitigation Measures

4.1.1 Bill Mitchell Park

The works proposed for Bill Mitchell Park will not affect the Aboriginal heritage sites associated with the sandstone formations along the eastern side of the reserve. It is also highly unlikely that any unintentional disturbances will occur as a result of future works for the project.

Construction activities to replace and/or upgrade the existing walkways in the park have minimal potential to expose as yet undetected Aboriginal archaeological evidence.below the current playing field surfaces. Procedures and protocols will be in place to allow any unexpected archaeological finds to be appropriately managed during future construction phases.

4.1.2 Ross Street Reserve

Future works for the construction of a boardwalk extending from the southern end of the Bill Mitchell Park seawall has the potential to disturb Aboriginal midden deposits located from a point at approximately the dingy rack located below Ross Street to a short distance beyond the sandstone steps and low seawall on the river waterline.

The preferred project options have been designed to mitigate direct impacts to the Aboriginal archaeological deposits in this location, and the Glades Bay Bath's stone steps and retaining wall at the waterline will remain unaffected by the proposal.

It is recommended that a *Heritage Impact Statement* (HIS) be prepared for the RSR when design and construction options for this component of the *Riverwalk* proposal are confirmed. The HIS would be developed in partnership with the MLALC and would identify adequate levels of heritage protection and conservation and management approaches. The HIS would also identify the need for an *Aboriginal Heritage Impact Permit* (AHIP) to be sought from the OEH to guide future works.

4.1.3 Glades Bay Park

The open Aboriginal midden situated on the current Waluba Track alignment in Glades Bay Park near the creek crossing may be impacted upon by future project works programs. The extent of the archaeological deposits at this site has not been yet mapped. Pedestrian traffic along the track is contributing to cause the gradual erosion of the archaeological deposits at this site.

It is recommended that a HIS should be prepared for this part of Glades Bay Park when precise foreshore boardwalk design plans are confirmed. This will assist clarifying potential heritage constraints that may exist in this location, and also help in identifying other allied environmental/ecological constraints that may occur to western edge of the Aboriginal site towards the inter-tidal zone.

It is further recommended that a HIS be prepared from where the sandstone outcropping increases with the rise in topography from the creek to encompass the rock engraving and axe grinding groove sites and their surrounds. There is the possibility that as yet unrecorded rock engravings and axe grinding grooves exist is this part of the parklands.

Any proposal to investigate whether further engravings occur nearby to those currently visible, and the additions to the timber decks and steps at this site and that of the axe grinding grooves should be guided by the preparation of a *Conservation Management Plan* (CMP) given the potential for further engravings and axe grinding grooves to remain covered by vegetation in the bush land in this part of the parkland.

4.1.4 Looking Glass Bay Park

No heritage constraints have been identified for the proposed improvements in Looking Glass Bay. It is recommended that a HIS be prepared for future works when design options are confirmed to provide consistency in the due diligence approach that has been applied to heritage management planning for the project.

APPENDIX F MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the environmental assessment provisions of the *Environment Protection and Biodiversity Conservation Act 1999*, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Sustainability, Environment, Water, Population and Communities.

Factor	Impact
a. Any impact on a World Heritage property? There are no World heritage properties in the locality.	Nil
b. Any impact on a National Heritage place? There are no National Heritage places in the locality.	Nil
c. Any impact on a wetland of international importance? There are no wetlands of international importance in the locality.	Nil
d. Any impact on a listed threatened species or communities? There are no listed threatened species or communities that have the potential to be impacted by the proposal.	Nil
e. Any impacts on listed migratory species? There are no listed migratory that have the potential to be impacted by the proposal.	Nil
d. Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the locality.	Nil
g. Does the proposal involve a nuclear action (including uranium mining)? The proposal does not involve a nuclear action.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? There would be no impact on Commonwealth land.	Nil

APPENDIX G 7 PART TEST ASSESSMENT OF SIGNIFICANCE

Assessment of Significance (TSC Act)

Section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) specifies seven factors to be taken into account in deciding whether a development is likely to have a significant impact on threatened species, populations or ecological communities, or their habitats listed on the *Threatened Species Act 1995* (TSC Act).

The following Assessment of Significance assesses the level of likely impact associated with the proposed Ryde River Walk through Bill Mitchell Park and Glades Bay Park on the Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions endangered ecological community (EEC).

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

N/A

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

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

i) The foreshore near Ross Street has isolated patches of coastal saltmarsh which is currently at risk of being impacted by informal pedestrian access. The proposed raised boardwalk would avoid the saltmarsh which would guide park users around the saltmarsh. The patches of saltmarsh would be designated no go areas to protect the saltmarsh during construction. The boardwalk would be around 1.5 metres wide and constructed of mesh which would minimise potential shading impacts. The use of boardwalks is recommended in the best practice guidelines for coastal satmarsh (DECC 2008) to minimise and/or avoid impacts due to unrestricted pedestrian access. The boardwalk would be raised and unlikely to impact the tidal flooding of this area.

ii) The proposed construction activities have the potential to increase potential weeds in the area if construction plant and workers move from weed infested areas and bring weedy propagules to the site. Mitigation measures would be put in place to minimise this risk such as cleaning of

construction plant prior to entering coastal saltmarsh area. Other management measures such as weed management have also been proposed.

The proposal is 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.

d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

i) The proposal is unlikely to remove or modify the habitat of the EEC to a substantial degree. The saltmarsh would be a no-go area during construction. The boardwalk would be raised and unlikely to impact the tidal flooding of this area.

ii) The proposed boardwalk would be raised and therefore no area of habitat would become fragmented as a result of the proposal.

iii) The intertidal habitat and landward areas are important to the long term survival of coastal saltmarsh. The disturbance of this habitat as a result of the proposal is unlikely to impact the long term survival of the community. The raised boardwalk would improve the long term survival of this community by restricting pedestrian access which has caused some disturbance to the saltmarsh. It should be noted that the landward migration potential of the saltmarsh is limited in this area due to residential properties.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No areas of critical habitat have been declared for the study area.

f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.

No recovery plan or threat abatement plan has been prepared for this EEC.

.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Potential key threatening processes relevant to the proposal include:

- Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands.

The proposal would include the construction of a boardwalk over water in the intertidal zone of Glades Bay. The boardwalk would require some piling. The piles would be of a limited size and the boardwalk would be constructed at a sufficient level over the Mean High Water Mark that the natural tidal flows would not be impacted. Safeguards have been recommended to ensure the design takes into account the potential impacts of sea level rise.

The disturbances during construction as a result of piling and the use of a barge are unlikely to have major impact on flows and would be temporary.

Conclusion

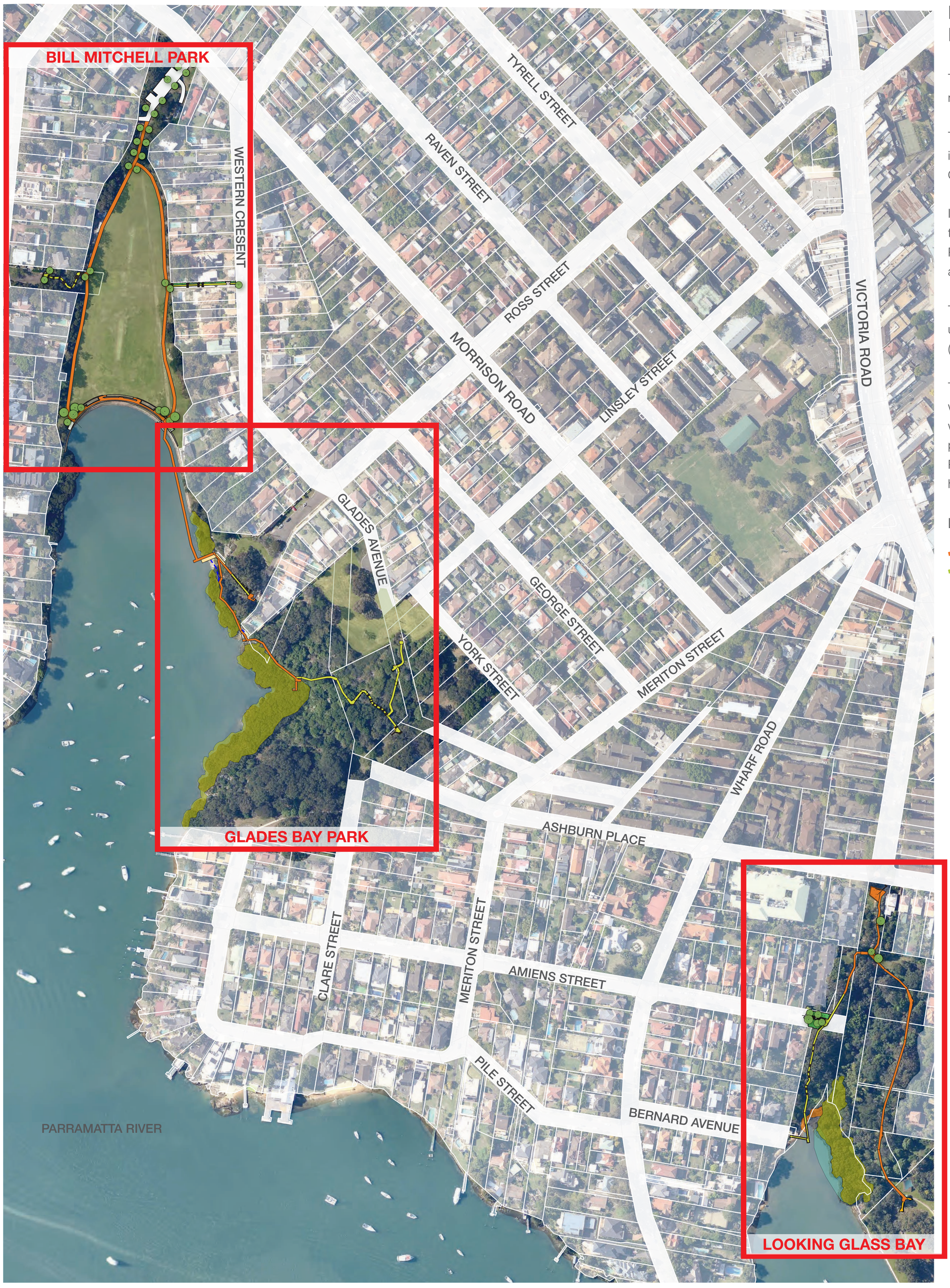
The Assessment of Significance has concluded that the proposal is not likely to significantly affect the Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions, directly or indirectly with the implementation of safeguards as recommended in this REF.

Based on this assessment a Species Impact Statement is not required.

References

DECC (2008). Best practice guidelines for coastal saltmarsh.

Landscape Plan | **Context**



Landscape Master Plan | **Background**

The Ryde Riverwalk is an 8km trail located alongside the northern edge of the Parramatta River in Gladesville.

The site scope formalises a 2km (approx.) of existing informal trail along the coastal edge of Bill Mitchell Park, Glades Bay Park, and Looking Glass Bay Park.

It forms part of a regional river walk that follows existing trails and roads in Ryde from Wharf Road in the east to Punt Road in the west via a series of interconnected parks and reserves (see Ryde River Walk Master Plan, 2007).

The site area encompasses 3 of the 4 remaining park upgrades to complete the entire River walk Master plan (only Banjo Patterson Park on the western end remains)

The existing route is also well known to local bush walkers, and is listed on the 'Walking Coastal Sydney' website for the Walking Volunteers. Importantly, it forms part of a coastal walk that stretches from Woolwich to Parramatta, and traverses sites of Aboriginal and cultural history, ecological importance, and spectacular scenery.

Landscape Plan | **Key**

- Accessible Path Network (no stairs)
- Path Network with stairs

Strategy | **Principles and key considerations**

The landscape concept is a response to;

- Providing an imtimate scaled pathway that formalises an existing trail.
- Maximising the extent of accessible pathway where grades permit
- Respecting the neighboring property interface through careful siting of the pathway and boardwalk
- Ensuring that the pathway is located to prevent impact on historical (both Aboriginal and Colonial) artefacts
- Locating and designing the pathway to minimise impact on vegetation. Locating the pathway away from the most significant vegetation communities (Saltmarsh)
- Providing a variety of experiences along the pathway, with opportunities to rest, read about the local history and absorb the views.
- Providing carparking to prevent impacts on local roads for users of the path.
- Providing a design that is unique to Ryde, and unified in its character.
- Providing a scheme that is sustainable; is robust and achieves a 50yr lifespan.
- Enhacing the natural environemt through provision of additional tree and understory planting.

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: **1:2000 @ A1**

0 40 80 120 160m

Landscape Master Plan | Development Application

Dwg no. : **11050-L001**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Bill Mitchell Park**

MORRISON ROAD

+RL10.60

1:20

2

+RL2.00

WESTERN CRESENT

1

+RL12.70

+RL2.00

DETAIL 01

3

DETAIL 02

6

+RL1.50

5

RL1.30+

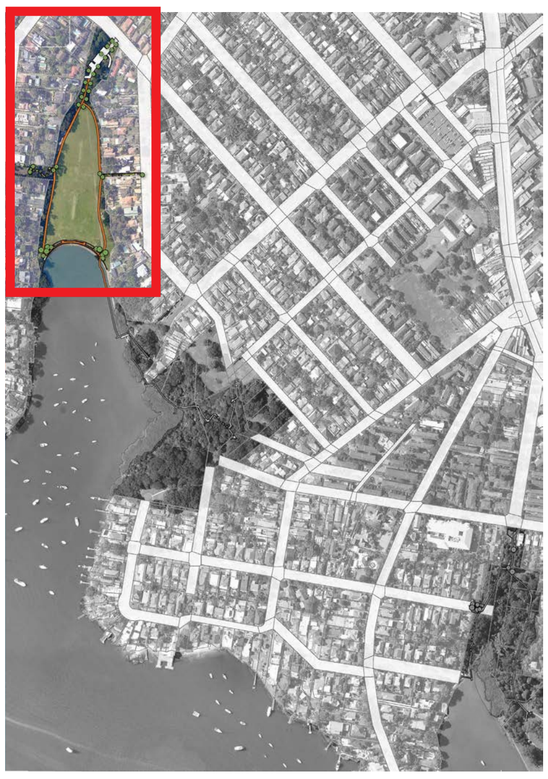
4

RL1.30+

ELEVATION 01

SECTION 02

Landscape Plan | **Context**



Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. 2.5m Concrete path, appropriate for vehicular loads (bin collection/ maintenance vehicle)
2. New carpark. Asphalt surface with new avenue planting of Angophora costata
3. Existing soccer field rotated to remove goal posts from main line of sight.
4. Existing seawall to be retained.
   New gathering space; low brick walls with integrated seating, crushed stabilised sandstone surface and new sporting fence within mass planting
5. Grove native trees including Eucalyptus botrioydes and Glochidion ferdinandi. Mass understory of native grasses and groundcovers
6. New bech seats; steel with timber slats.

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

Landscape Master Plan | Development Application

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

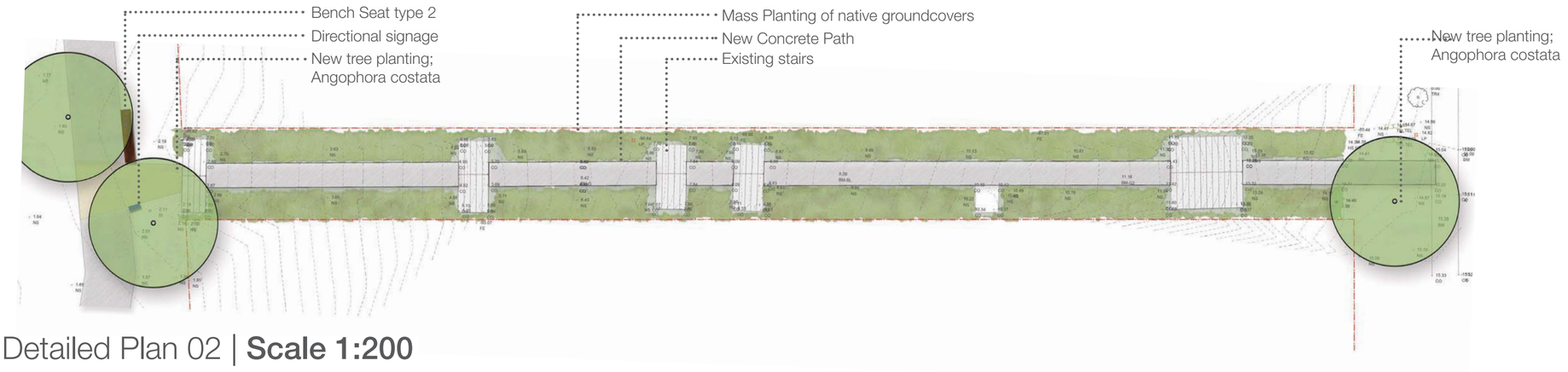
Scale: **1:500 @ A1**

0 10 20 30 40m

Dwg no. : **11050-L002**
Rev: **C**
Date: **November 2012**

Landscape Plans, Sections & Perspectives | **Bill Mitchell Park**

Detailed Plan 01 | **Scale 1:200**



Detailed Plan 02 | **Scale 1:200**

Section 01 | **Scale 1:100**

Elevation 01 | **Scale 1:100**

Perspective 01 | **Bill Mitchell Reserve looking south**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

Landscape Master Plan | Development Application

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

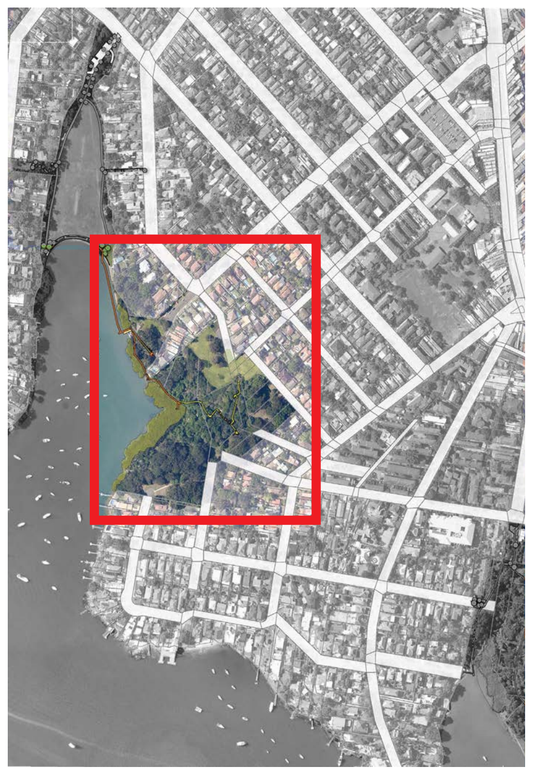
Scale: **1:500 @ A1**

0 10 20 30 40m

Dwg no. : **11050-L003**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Glades Bay**

Landscape Plan | **Context**



Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. 1.8m wide fiberglass mesh boardwalk with balustrade.
2. Existing dingy storage rack. New ‘slip way’ ramp into water
3. Upgrade existing stairs; crushed stabilised sandstone path with sandstone stairs
4. Lookout with sandstone flagging and seat.
5. Existing salt marsh to be protected
6. New 1.5m wide Fibreglass mesh boardwalk through bushland. Low profile to existing ground
7. Remove existing fiberglass mesh and replace with crushed stabilised sandstone pathway.
8. Preserve existing aboriginal sites.
9. Existing bridge removed. New bridge located adjacent to protect existing Glochidion trees
10. New surface; fibreglass mesh, on existing bridge structure over creeks.
11. Rest areas with integrated seating in interpretive signage
12. On-grade pathway; crushed stabilised sandstone path, 1.5m wide, with sandstone steps

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

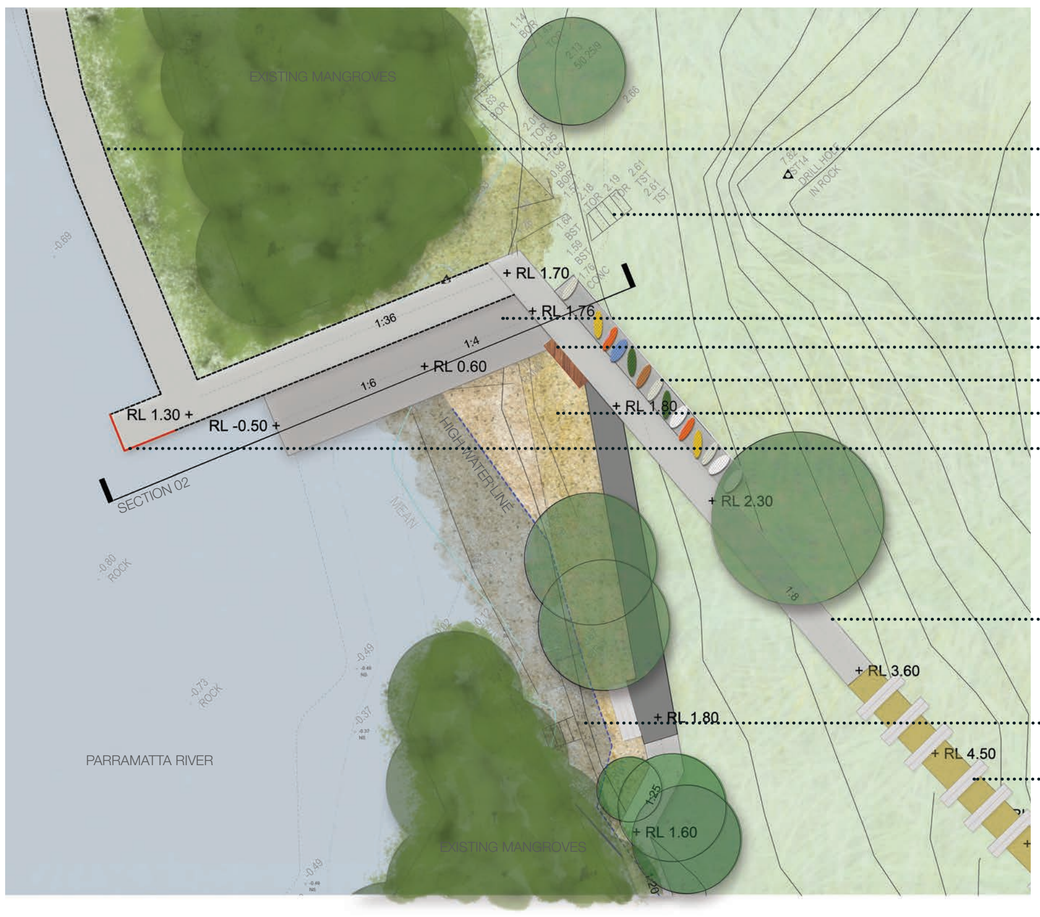
Scale: **1:500 @ A1**

0 10 20 30 40m

Landscape Master Plan | Development Application

Dwg no. : **11050-L004**
Rev: **C**
Date: **November 2012**

Landscape Sections & Perspectives | **Glades Bay**



Balustrade edge to 1.8m wide fiberglass mesh boardwalk.

Existing stairs to be retained

Fibreglass mesh boat launch

New seat

Existing dingy/boat storage

Existing rock to be protected

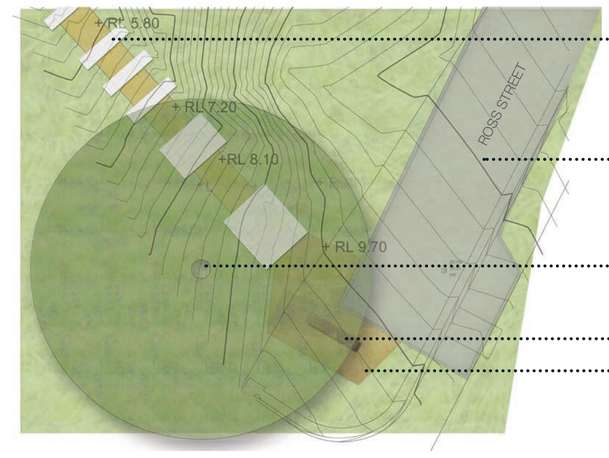
Lean rail

1.5m fiberglass mesh boardwalk

Existing sandstone retaining wall and steps of historic baths to be retained

New sandstone block steps and 1.5m crushed stabilised sandstone path along existing track alignment.

Detailed Plan 03 | **Scale 1:200**



New sandstone block steps and 1.5m crushed stabilised sandstone path along existing track alignment.

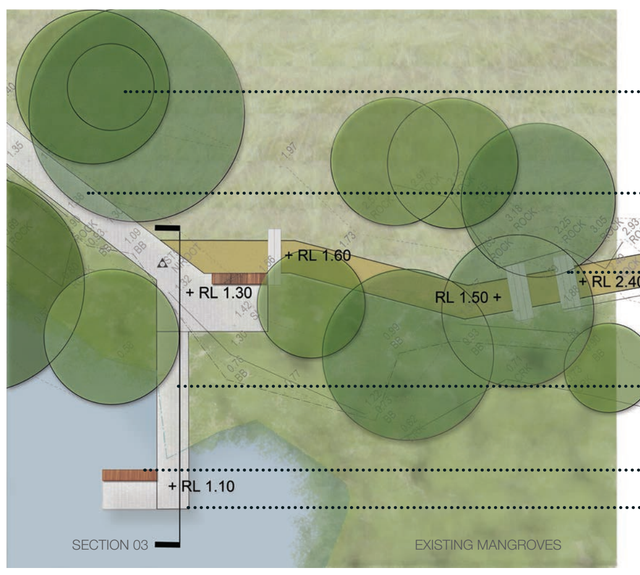
Existing Road

Existing tree

New seat

Sandstone Flagging

Detailed Plan 04| **Scale 1:200**



Existing trees to be retained and protected

1.5m fiberglass mesh boardwalk

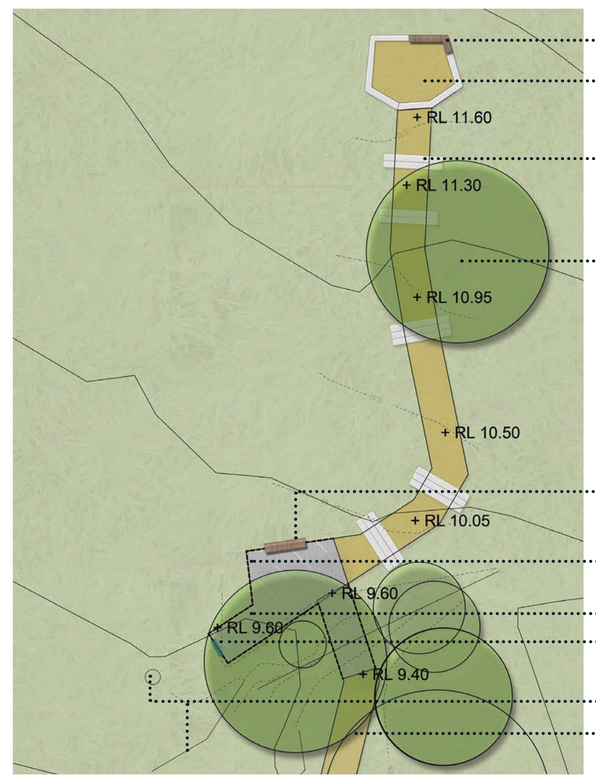
New sandstone block steps and 1.5m crushed stabilised sandstone path along existing track alignment.

1.5m fiberglass mesh boardwalk

New seat

Lean rail

Detailed Plan 05| **Scale 1:200**



New seat

Existing sandtone edge and seat to be retained.

New sandstone block steps and 1.5m crushed stabilised sandstone path along existing track alignment.

Additional native tree planting

New seat

Balustrade edge

New surface over existing bridge

Signage interpreting indiginous history

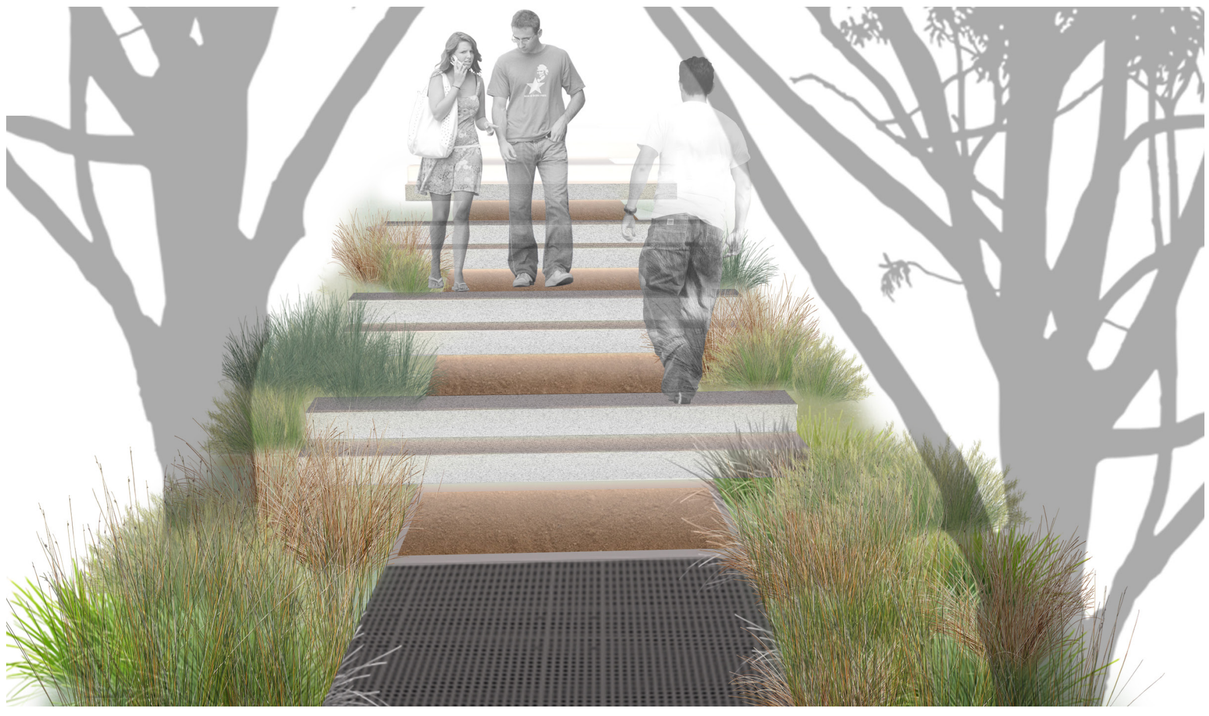
Preserve existing Aboriginal sites

Remove existing plastic and timber tracks

Detailed Plan 06| **Scale 1:200**

Section 02 | **Scale 1:100**

Section 03 | **Scale 1:100**



Perspective 02 | **Glades Bay Reserve looking south-east**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: **1:500 @ A1**

0 10 20 30 40m

Landscape Master Plan | Development Application

Dwg no. : **11050-L005**
Rev: **C**
Date: **November 2012**

Landscape Plan | **Looking Glass Bay**

Landscape Plan | **Context**

Landscape Plan | **Key**

- Proposed Tree: Native
- Proposed Tree: Exotic
- Proposed Mass Planting
- Existing Mangroves
- Existing Salt Marsh
- Fibreglass Mesh Boardwalk
- Insitu Concrete Paving
- Crushed Stabilised Sandstone
- Sandstone Flagging
- Bench Seat
- Signage Plinth
- Kickrail
- Lean Rail
- Balustrade edge

Landscape Plan | **Concepts**

1. Sydney water sewer pump station
2. Existing salt marsh to be protected.
3. 1.5m wide fiberglass mesh boardwalk with balustrade and lean rail.
4. New entry; concrete unit path with sandstone steps. New tree planting; Angophora costata and Glochidion ferdinandii in native grass understory.
5. Rest area with integrated seating and signage
6. New entry; upgraded lawn and edging, new seats, and existing sandstone flagging entry. New tree planting; Angophora costata and Glochidion ferdinandii in native grass understory.
7. New concrete footpath; 1.5m wide, with decorative sawcuts
8. New crushed stabilised sandstone seating areas and path with integrated seating
9. Connect to existing path in Banjo Patterson Park

Landscape Sections & Perspectives | **Looking Glass Bay**

Detailed Plan 07| **Scale 1:200**

Section 04 | **Scale 1:100**

Section 05 | **Scale 1:100**

Perspective 03 | **Looking Glass Bay looking South**

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

Landscape Master Plan | Development Application

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: **1:500 @ A1**

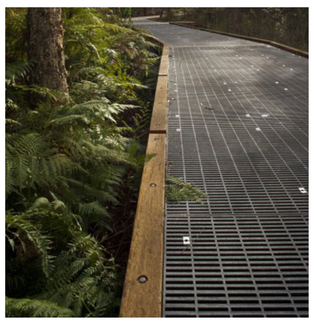
0 10 20 30 40m

Dwg no. : **11050-L007**
Rev: **C**
Date: **November 2012**

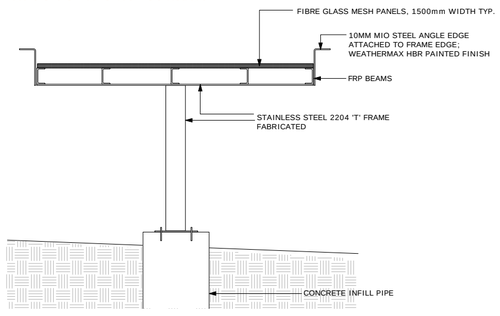
Landscape Plan | **Materials Palette**

SURFACES & STAIRS

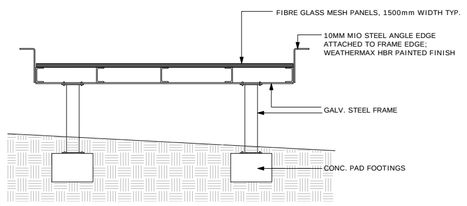
Ground Surface Type 1:
Fibreglass Mesh
- 1.5m wide generally
- 1.8m wide with balustrades
- Used for sections over water or undulating land



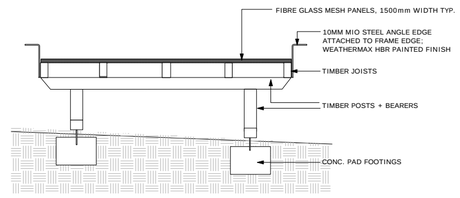
G1.1: Over water



G1.2: On Land

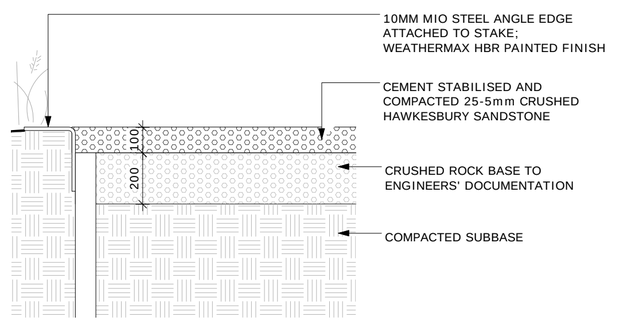


G1.3: On Land



Ground Surface Type 2:
Insitu Concrete Paving
- 1.5m wide
- Decorative diagonal sawcuts at 800mm cts
- Used for on-grade paths where grades exceed 1:20

Ground Surface Type 3:
Crushed Stabilised Sandstone
- 1.5m wide
- Used at entries, rest areas and to water's edge of Bill Mitchell Park



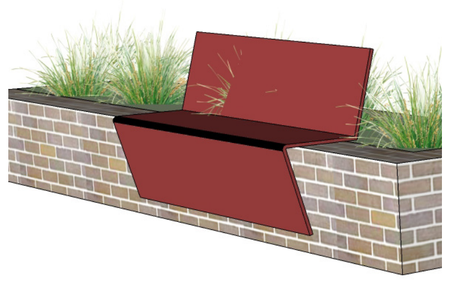
Ground Surface Type 4:
Sandstone Flagging
- Mortar jointed and laid on concrete base
- Used at entries and path junctions

Stairs Type 1:
Sandstone block steps
- 2.6m wide
- Used at entries and within bushland areas

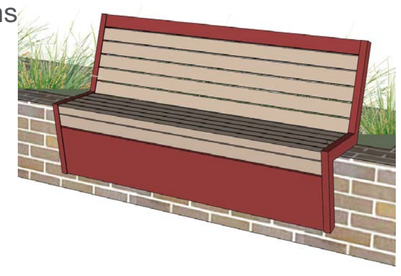
WALLS & SEATS

Walls Type 1:
Brick Wall
- Double course brick wall
- Mass concrete footing
- Used at Bill Mitchell Park water's edge

Bench Seat type 1:
Folded steel edge
- With or without backrest
- MIO 10mm folded steel plate
- Installed at edge of boardwalk and rest stops

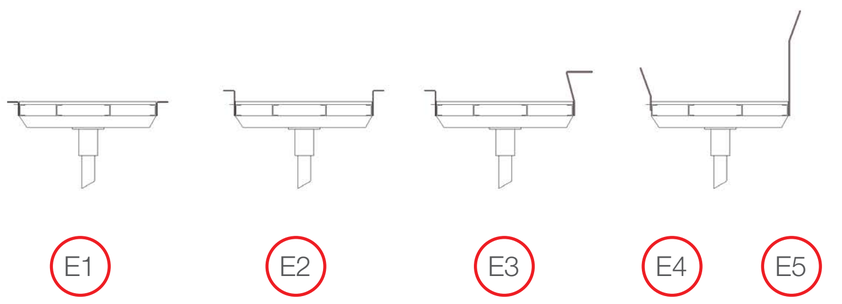


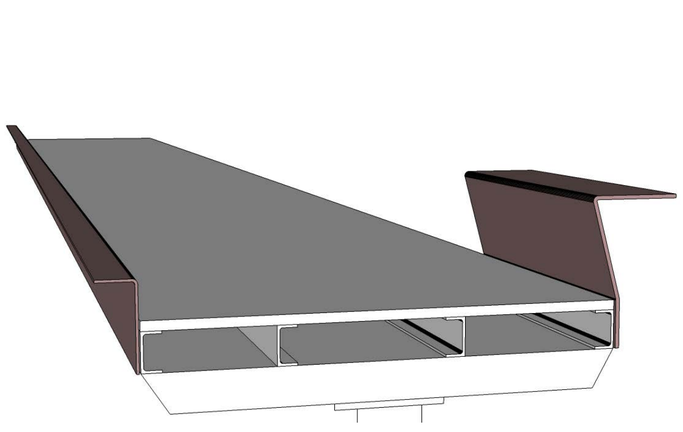
Bench Seat type 2:
Folded steel with composite battens
- MIO 10mm folded steel frame
- Composite plastic battens
- Attached to wall at Bill Mitchell Park
- Free standing seats at rest stops

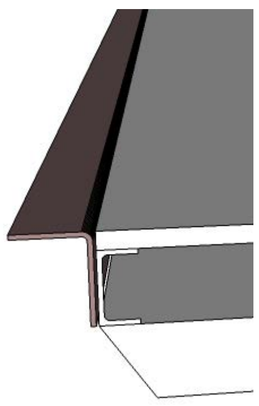


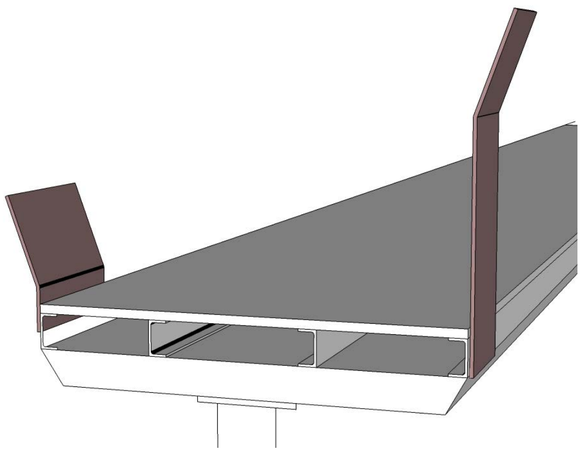
EDGES

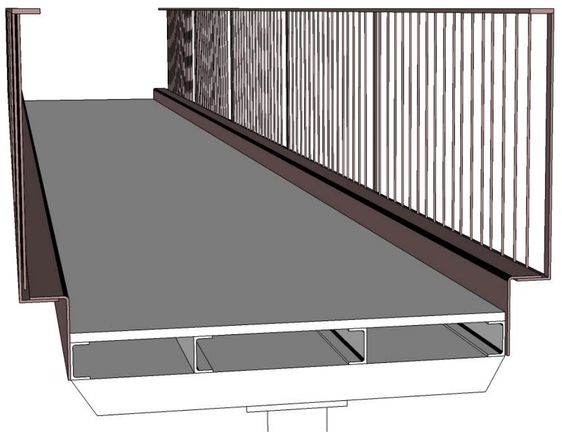
Folded Steel Edge Treatments:
1. Flush Edge
2. Kickrail
3. Perch Seat
4. Signage Plinth
5. Directional Signage
6. Lean Rail
7. Balustrade





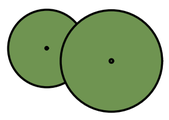






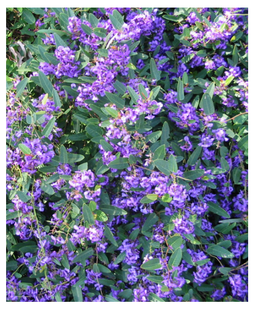
PLANTING

Tree Type 1:
Native Evergreen Tree



Species:
- Eucalytpus botrioydes
- Glochidion ferdinandi
- Angophora costata

Mass Planting Type 1:
Native Understorey Grasses and Groundcovers (0.5m max height)



Species:
- Lomandra longifolia
- Dianella carulea
- dianella prunina
- Isolepis nodosa
- bursaria spinosa
- dodonaea triquetra
- lomandra filiformis
- hardenbergia violacea
- juncus usitatus
- kennedia rubicunda
- banksia serrata
- olearia microphylla
- wahlenbergia ssp.
- hakea dactyloides

Ryde Riverwalk | Bill Mitchell Reserve, Glades Bay, & Looking Glass Bay

ASPECT Studios™

Client: City of Ryde

Drawn: **NB/EO**
Checked: **SC**

Scale: **1:500 @ A1**

0 10 20 30 40m

Landscape Master Plan | Development Application

Dwg no. : **11050-L008**
Rev: **C**
Date: **November 2012**