



Appendix B

Tree Assessment



TREE MANAGEMENT CONSULTING ARBORICULTURISTS

ARBORICULTURAL ASSESSMENT

for

POD Landscape Architecture
192 Barcom Avenue
DARLINGHURST NSW 2010

SITE ADDRESS
PROPOSED RYDE RIVER WALK

NOVEMBER 2006



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1 INTRODUCTION

- 1.1 This Arboricultural report was commissioned by Mr Steven Hammond of POD Landscape Architecture.
- 1.2 The purpose of this report is to provide a preliminary evaluation of the draft Ryde River Walk Master Plan, from an arboricultural impact perspective. The report reviews the proposed routes of shared (cycle/pedestrian) and pedestrian paths and trails linking several parks from West Ryde Jetty to Banjo Paterson Park.
- 1.3 This report assesses the potential conflicts between the locations of existing trees or vegetation, and proposed routes or path types. The report is intended only as a guide to reduce identified potential impacts on the existing trees or vegetation, and does not provide individual or specific measures to avoid impacts on trees.
- 1.4 This report does not give recommendations for tree retention and removal, or provide guidelines for tree protection and maintenance. The report may recommend further investigation of trees where hazardous defects have been noted during the site assessments.

2 METHODOLOGY

- 2.1 In preparation for this report, ground level preliminary assessments of the subject areas were undertaken by the author of this report on 28th and 30th July, 10th August and 2nd September, 2006.
- 2.2 Field observations were written down. Digital photographs of selected trees or areas were taken to aid clarification of potential problem areas. Several photographs were included in this report.
- 2.3 Plans and documents referenced for the preparation of this report include:
 - River Walk Master Plan Draft Report, dated June 2006, prepared by POD Landscape Architecture.
- 2.4 No individual tree appraisals were carried out during the site assessments. If any potentially hazardous trees were observed during the course of the site assessments, this has been noted in the report.

3 OBSERVATIONS AND DISCUSSION

3.1 PRECINCT 1: WHARF ROAD TO LANCASTER AVENUE

3.1.1 Koonadan Reserve

The westernmost location of the proposed river walk begins at the Wharf Road car park. The existing path through Koonadan Reserve is well away from any significant trees or vegetation, and can be easily upgraded without any special arboricultural requirements for tree protection.



Figure 1 KOONADAN RESERVE
Looking east towards Melrose Park.

3.1.2 Melrose Park

There is a significant group of semi-mature Eucalypts and Casuarinas in this park. An existing asphalt path curves between a number of the trees. There is some visible upheaval of the pavement surface between two She-oaks (see Figure 2). Whilst the damage is only minor at this stage, it is likely to increase in severity as the tree's roots extend and increase in girth. The surface will become an increasing trip hazard, particularly at night when visibility is reduced.

A gradual 'hump' in the path may overcome this problem, without adversely affecting tree root growth. The current path and upgrading of same shouldn't have any adverse impacts on trees in this park subject to specific arboricultural advice.



Figure 2 MELROSE PARK

Looking west to Koonadan Reserve. Location of minor pavement damage caused by tree roots indicated with yellow arrow.

3.1.3 Lancaster Avenue

Lancaster Avenue is an existing type 5, mixed traffic street. For the most part there are existing pedestrian paths of suitable width.

Where proposed new paths, or upgrading of existing paths, is to be carried out near established trees (i.e. trees with a stem diameter of 100mm or more), the impacts of the works on the individual tree needs to be considered. An arborist should be consulted before, and at the time of, any works.

3.2 PRECINCT 2: MEADOWBANK PARK TO RHODES BRIDGE

3.2.1 Laneway Link from Lancaster Avenue to Meadowbank Park

A narrow laneway link from the east end of Lancaster Avenue to Meadowbank Park does not have any trees in proximity which would be affected by any upgrading or widening of the path.

3.2.2 Meadowbank Park

A significant row of Brush Boxes (*Lophostemon confertus*) is located alongside an existing path at the rear of houses facing Crowley Crescent. (Figure 3)

The proposed path appears to well clear of these trees, and no impacts to these trees would be expected as a result of new path construction.

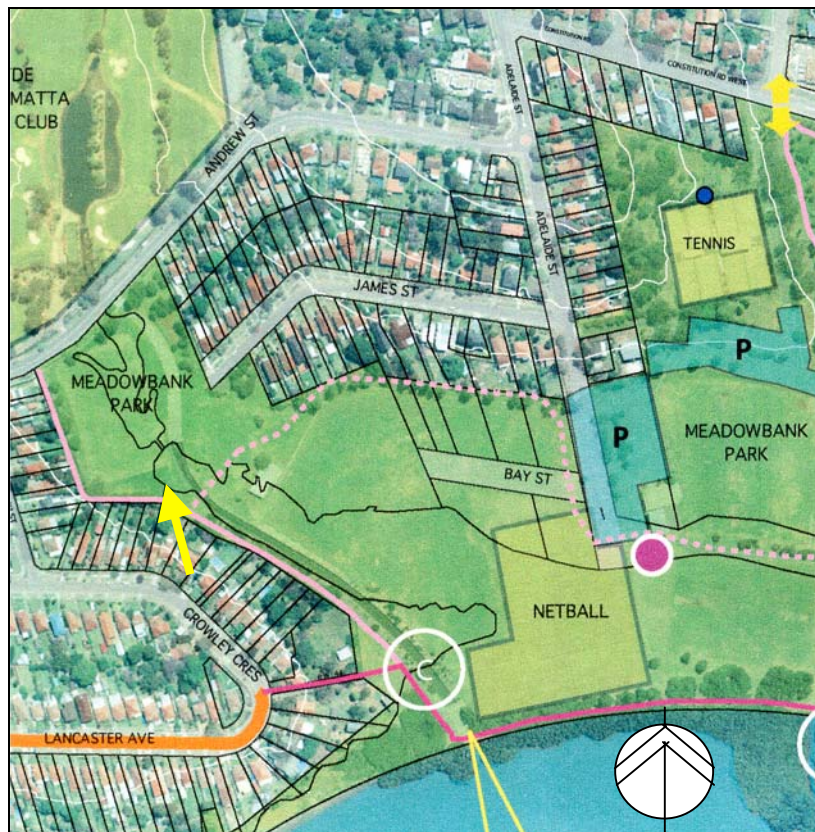


Figure 3 MEADOWBANK PARK
Location of row of Brush Boxes (yellow arrow).



Figure 4 MEADOWBANK PARK

Looking south between end of row of Brush Boxes, and significant red Ironbark.

- 3.2.3 A large and significant Red Ironbark (*Eucalyptus sideroxylon*) was noted West of the Brush Boxes. The proposed path does not impact on this tree.
- 3.2.4 The proposed shared loop path can be easily accommodated between the existing Broad-leaved Paperbark (*Melaleuca quinquenervia*) on the left in the photograph (Figure 5, following page), and the very young sapling on the right.



Figure 5 MEADOWBANK PARK

Looking east to rear of properties facing James Street. There is ample space available between the two trees for a 2.5 metre wide path.

- 3.2.5 To the right of these trees, near the existing clubhouse (out of frame), a mature Small leaved Peppermint (*Eucalyptus nicholii*) is growing. Any proposed path should be kept a minimum of 5 metres from the trunk of the tree to ensure no significant impacts occur within the tree root zone.



Figure 6 MEADOWBANK PARK

Looking east towards Adelaide Street public carpark.

3.2.6 There is little scope for any hard surface path between these trees in Figure 6, and the adjoining private properties, or between the trees and the concrete canal running along the south side of the trees. Any path along this side of the park would need to skirt the adjacent soccer fields, and possibly be banked on one side to achieve a fairly level and uniform pathway to link the west end of Meadowbank Park to the east section.



Figure 7 MEADOWBANK PARK

Looking west towards netball clubhouse and courts. The trees are adjacent to the existing cricket practice enclosures.

3.2.7 This section of the existing path shown above in Figure 7 may be upgraded, although it should not encroach further towards the existing trees without further assessment and advice from an arboriculturist.

3.2.8 Section of Proposed Path through Mangroves

There is potential for construction of an elevated pedestrian boardwalk through a section of the Mangroves as shown on the Precinct 2 map. The materials used, and method of construction would need to be developed in association with ecologists familiar with Grey Mangrove (*Avicennia marina* var. *australasica*), and experienced in developing this type of structure within an important estuarine system. The pedestrian boardwalk is achievable, but would need to be of appropriate widths and form to avoid loss of significant trees.

3.2.9 Memorial Park

An existing path from Meadowbank Park to Charity Point is generally of good condition. Any future widening should consider the presence of existing trees and vegetation, and follow the general guidelines set out in the recommendations section of this report. There were no stand alone significant trees noted through this section.



Figure 8 MEMORIAL PARK

Section of existing path climbing the slope in a north direction towards Meadow Crescent.

3.2.10 It appears the proposed Type 1 path generally follows the existing paths.

The existing paths appear to be in generally good condition with little tree root damage. Any widening of the path or construction of new paths near existing trees must be subject to advice from an arboriculturist prior to any final design, or commencement of construction. There are several large and significant Forest Red Gums (*Eucalyptus tereticornis*) lining, or close to, the paths which could be damaged as a result of new works.

3.2.11 It was noted during my inspection that several mature Forest Red Gums have structural defects ranging from minor to severe. These trees should be individually assessed by a competent arboriculturist to determine their hazard potential, and the level of risk associated with their retention near paths or other areas used by the public.



Figure 9 MEMORIAL PARK

Looking west. Meadow Crescent is to the right of the photograph. An existing path is running between the barbecue area and the street. Several large trees are located near the path. Any future widening of paths may impact on tree root systems.

3.2.12 Bank Street

A type 4 off-road, segregated footpath is proposed along Bank Street from Meadow Crescent. Any potential works within proximity to existing trees will require specific arboricultural assessment and advice.

3.3 PRECINCT 3: RHODES BRIDGE TO RYDE BRIDGE

3.3.1 Headland and Helene Parks

This section has an existing path, sections of which have signage on the path surface designating it as shared or segregated. Many of the pathways are relatively new, and have little or no damage to the surfaces. It was noted certain sections are undergoing changes to accommodate adjacent development, and upgrading of the Meadowbank Wharf areas.

There were no significant trees or vegetation in this area that would warrant specific arboricultural input at this point.

3.3.2 Rothesay Avenue

This is a quiet street accessing nearby offices and warehouses. No issues that could impact on trees were noted.

3.3.3 Anderson Park

A large Hills Weeping Fig (*Ficus microphylla* var. *hillii*) is located at the northwest end of the public car park, adjacent to Rothesay Avenue (Figure 10).

An unformed dirt track passes below the canopy of the tree and over the root zone.

A 3.5 metre wide shared path is achievable subject to arboricultural advice. Some pruning of the canopy over the pathway to maintain adequate clearance for pedestrians and cyclists would be required.



Figure10 ANDERSON PARK

Looking northwest towards Rothesay Avenue. Large Hill's Fig at edge of car park.

3.3.4 Shepherds Bay Park

Fairly new existing shared paths. No significant vegetation noted.

3.4 PRECINCT 4: RYDE BRIDGE TO KISSING POINT PARK

3.4.1 Loop Road

Fairly new existing shared paths. No significant vegetation noted.

3.4.2 Settlers Park

No impacts. Access via Waterview Street

3.4.3 Waterview Street –

Area A (Refer to Figure 14 on page 16 for location)

A double row of Cypresses (*Cupressus* sp) and Camphor Laurels (*Cinnamomum camphora*) lines the west side of the road reserve along Waterview Street. (Figure 11)

A type 4 off -road segregated path is proposed along this section.

It is unlikely a 2.5 metre wide path of this type can be accommodated between these trees without some impact on the roots.

It was noted the street is not kerbed and guttered along the west side. The distance from the edge of the road surface to the closest row of trees is several metres. It is possible a cycle lane could be accommodated in this location, and the pedestrian path installed between the two rows of trees.



Figure 11 WATERVIEW STREET

Looking west. Meadow Crescent is to the right of the photograph. An existing path is running between the barbecue area and the street. Several large trees are located near the path. Any future widening of paths may impact on tree root systems.

3.4.4 Bennelong Park

Area B (Refer to Figure 14 on page 16 for location)

The upper (east) section of the park can accommodate paths near the boundary, which will not interfere with trees. The path should be kept close to the boundary at the north end to skirt some young trees near the children's swings.

3.4.5 Kissing Point Park

Area C (Refer to Figure 14 on page 16 for location)

There are approximately fourteen (14) mature and semi-mature trees in this area, including Swamp Mahoganies, Turpentines and Hills' Figs (Figure 12).

The proposed Type 2 east path can easily skirt the trees, and be located close to the park's east boundary.

The proposed Type 3 path is located within the tree group. This path appears to meander through the group. There is an unformed path (a 'desire' line) between the existing Figs and the shore, which may be a more suitable location for the path. As the ground is undulating through this section, it may require short, elevated sections to span depressions, and avoid significant tree roots.

It is preferable to incorporate the existing 'desire' line, rather than to cause impacts on other trees by diverting a path through the group.



Figure 12 KISSING POINT PARK
Looking south towards the tree group in Area C.

Area D (Refer to Figure 14 on page 16 for location)

A large Red Ironbark (*Eucalyptus sideroxylon*) and Argyle Apple (*Eucalyptus cinerea*) are growing near the north side of Yaralla Road (Figure 13).

A path could be located equidistantly between the two trees, subject to further assessment by an arboriculturist to determine the best methods for path construction.

A mature She-oak located several metres northwest, near the entry to the sailing club, should have any path kept outside a 3 metre setback from the trunk.



Figure 13 KISSING POINT PARK

Two significant trees that would require special attention prior to any final path design within 10 metres of the trees. No path should completely encircle the trees.

Area E (Refer to Figure 14 on page 16 for location)

There is ample room for a 1.5 – 2 metre shared path from the Kissing Point Park car park to approximately 125 metres northwest.

At this point there is a group of semi-mature She-oaks that encroach into the potential path area. These trees are unlikely to suffer from any path installed through this 'pinch point'; however, they are quite likely to damage any path over the root zones.



Figure 14

Plan showing the locations of Areas A to E, in Waterview Street, Bennelong and Kissing Point Parks.

The path along the boundary of the park and Waterview Street may impact on some existing trees opposite the Charles and Waterview Street intersection. The design of paths in this area must be subject to arboricultural advice.



Figure 15 KISSING POINT PARK

Intersection of Waterview Street and Delange Road, looking southwest towards Kissing Point wharf.

3.4.6 The two Coral trees (*Erythrina x sykesii*) in Figure 15 are visually important. The species, however, is known to be brittle. Any new paths should be kept out of the dripline of the trees to minimise any risk of injury by failing branches.

Alternatively the existing path should be utilised as the link to the eastern section of Kissing Point Park.

3.4.7 The proposed path can easily be constructed without impacts on the two young Turpentines (*Syncarpia glomulifera*) seen in Figure 16, below.



Figure 16 KISSING POINT PARK

From the southern end of Delange Road, looking southeast.

3.4.7 **Delange Road**

A proposed type 4 segregated footpath to link with Pellisier Road.

Any potential works within proximity to existing trees will require specific arboricultural assessment and advice. Refer to Recommendations.

3.4.8 **Chadwick Street**

A proposed type 5 on road, Traffic Street.

3.5 PRECINCT 5: KISSING POINT PARK TO PUTNEY PARK

3.5.1 Hoffman Park

This is within the proposed link in between Kissing Point Park and Pellisier Road, via Chadwick Street.

Adequate space is available for the proposed Type 1 path without impacting on existing trees. Preference is to be given to locating the path outside the drip line of the Small-leaved Peppermint (*Eucalyptus nicholii*) shown in the left of the photograph below - Figure 17.



Figure 17 HOFFMAN PARK
Looking west to Chadwick Street.

3.5.2 Pellisier Road and Jetty Roads

These are existing routes.

3.5.3 Putney Park

A long loop of type 3 shared trail is proposed from the car park at the north end of the park, to the southern end of the park, and back to the car park.

An existing path of approximately 2 metres width runs from the car park to the northwest corner of the park before it terminates. The path is in good condition and would require little, if any, upgrading to meet the specifications for the proposed shared trail.



Figure 18 PUTNEY PARK

Looking northeast. A group of 10 semi-mature Figs partially encircling the smaller playground area.

- 3.5.4 The proposed path around the smaller playground should be kept at least 4 – 5 metres away from the existing Figs, to allow adequate root spread. As the trees mature, their canopies will provide useful shade for park users. The use of any path in this immediate area by cyclists should be discouraged. This area is used by families. Young and active children could be at risk of being knocked over by cyclists. Consideration should be given to increasing the distance from the path to the trees, so families can spread out in the shade, or remove the proposed path entirely from this area.
- 3.5.5 There is a relatively clear area from the end of this existing path, along the foreshore to point B, shown below. Access is via stone steps to the upper open space and picnic areas. Cycle access would need to be diverted northeast around the escarpment and consider the location of a very large and significant Fig, (see Figure 34, page 33) the approximate location of which is shown by the red star below.

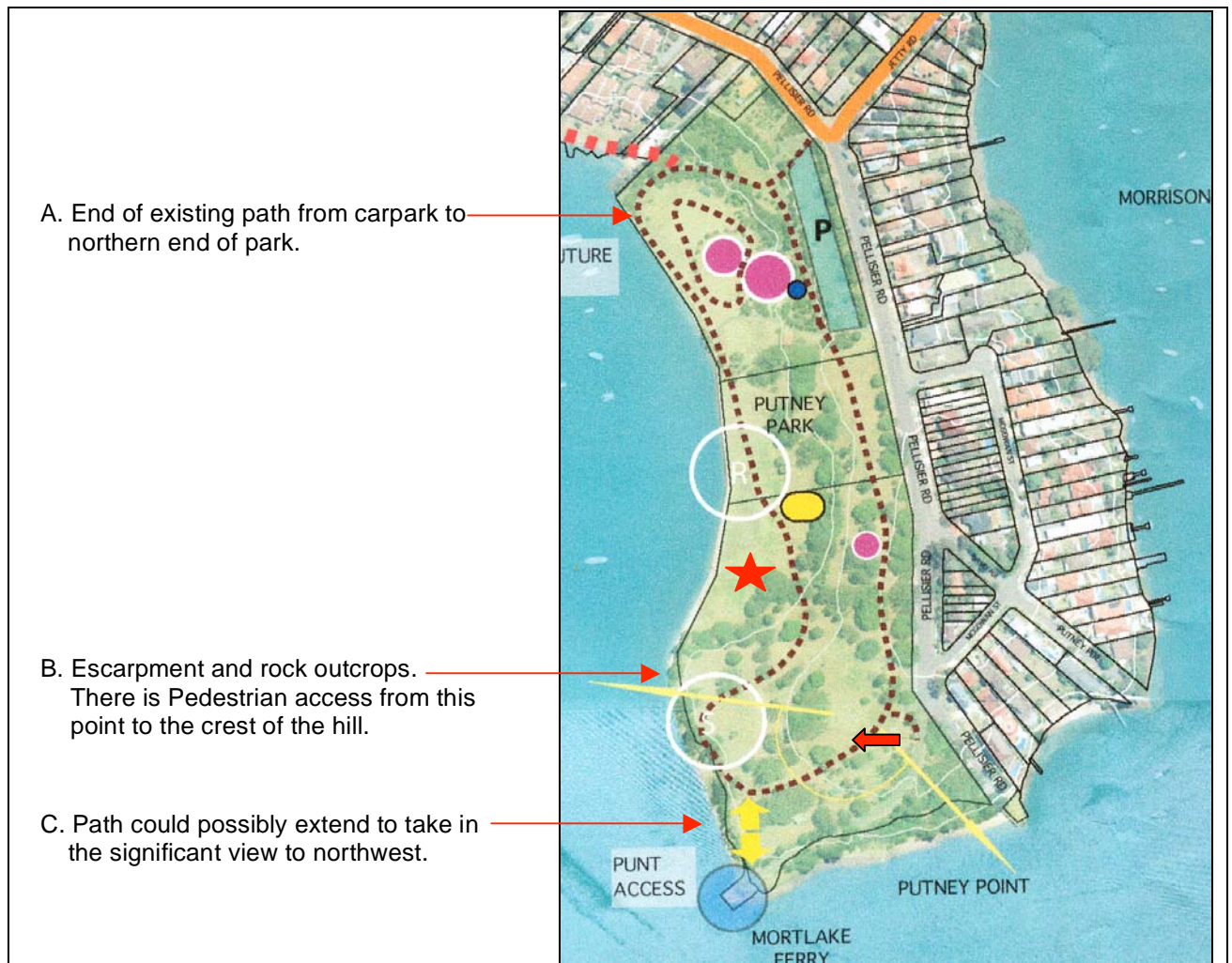


Figure 19 PUTNEY PARK

3.5.6 The proposed path needs to skirt several mature trees, some of which need to be investigated for hazard potential.

The proposed track could be extended as shown, as there is an excellent view corridor to the northwest and public toilets with established access paths in close proximity.

The proposed route (red dashed line) could link with the originally proposed route, whilst skirting large trees. There are also existing paths which could be upgraded and used as shared trails.

The route should also skirt the perimeter of the large open space area (indicated by red arrow), as this is used as an informal playing field by park visitors.

3.5.7 The path extends through several tree groups in the park along the Pellissier Road boundary. Whilst a large portion of the proposed path can be constructed with little impacts on nearby trees, there is a pinch point between the existing playground and the carparking area on the road reserve. Pathway construction materials and methods would be subject to more detailed investigation by an arboriculturist.

3.6 PRECINCT 6: MORRISONS BAY PARK TO GLADES BAY PARK

3.6.1 Southwest section

The initial section of the proposed pathway can be easily accommodated past the playing field, whilst maintaining a setback of at least 4 metres from an existing Bangalay (*Eucalyptus botryoides*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*), located near the rear boundaries of dwellings facing Stanley Street.

3.6.2 A 3 metre wide path is proposed through this group of trees - (Figure 20). Unless selective tree removal is carried out, this path width cannot be achieved. An alternative would be to direct the path to the south and east of this group, however, that may impact on the playing fields nearby. This would require further investigation to determine the feasibility of path location, either through the tree group or skirting the group.



Figure 20 MORRISONS BAY PARK

Looking northeast towards the parking area. A 3 metre path is proposed through this group of trees.



Figure 21 MORRISONS BAY PARK
Looking northeast, adjacent to Frances Road. Note spectator benches to right of trees.



Figure 22 MORRISONS BAY PARK
Looking northeast along Frances Road. Trees located in road reserve.

- 3.6.3 The trees within the park, (mainly She-oaks – Figure 21) and adjacent to Frances Road, could only accommodate a narrow path of around 1200mm width, unless selective removal of one or two trees is considered.

An alternative could be to locate the proposed path to the east of the trees; however, this would require the spectator to be moved closer to the playing fields, and possibly out of any shade provided by the trees.

The wide road reserve could also be considered for short access along this section of the park, which would remove impacts on trees, and interference with park visitors using the benches.

- 3.6.4 Between the sports ground car park and Frances Road, there are two rows of trees within the road reserve (Figure 22). There is little space to accommodate the proposed type 1 path without removal of several trees, and specific construction methods used to reduce impacts on tree roots would need to be adopted.

A young Fig tree in the road reserve at the west corner of the car park could be affected by new construction over the roots. It would require specific assessment and advice from an arboriculturist to ensure impacts are avoided or minimised.

- 3.6.5 Any proposed path near the Hill's Figs at the north end of the park (i.e. facing Morrison Road) should allow for a setback outside the canopy dripline of the trees. This group has paths on the road side and to the east already. Further works should be subject to an arboriculturist's advice.

3.6.6 **Bill Mitchell Park**

The location of the secured access gate restricts walkers and cyclists. On the right side of the gate (east) a couple of *Lomandras* could be removed, and some shrubs pruned, to create a narrow path access to the park. (Figure 23)

- 3.6.7 An existing unformed vehicular track runs along the west side of the park and terminates near the water front. A new pedestrian/cycle path would need to be located on the inside of this track, as there is inadequate space between the vehicle track and adjacent vegetation, rock walls and outcrops.
- 3.6.8 A concrete path along the east side of the park ends just short of the steep steps leading from the park to Western Crescent. At this point it appears the path has been removed and/or filled over. The photograph (Figure 24) shows the darkened strip leading back to the north entry to the park. This strip is in line with the direction of the existing concrete path. A new path could be located in this position, or closer to the park boundary. A large Camphor Laurel, located near the boundary, would need to be pruned to allow clearance for walkers and cyclists. If possible, the path should be kept to the outer extremity of the tree's dripline to reduce root impacts; otherwise, an arboriculturist should provide specific details of construction methods over the root zone to avoid unnecessary impacts on tree roots.



Figure 23 BILL MITCHELL PARK
Looking north, towards Morrison Road. Note driveway access to residences on left side of photograph.



Figure 24 BILL MITCHELL PARK
Looking north, towards park entry. Note darkened strip in grass, indicating probable location of old concrete path. This path may have been removed, or simply turfed over.

3.7 PRECINCT 7: GLADES BAY PARK TO BEDLAM BAY

3.7.1 Ashburn Place

Any widening of the existing footpath must consider the location of trees nearby.

A preliminary assessment based on the guidelines included in Recommendations (section 4) will help to determine which trees require specific assessment by a competent arboriculturist, before final path design is adopted.

3.7.2 Glades Bay Park

The type 3 shared trail path can be accommodated through this group of trees in Figure 25. As the ground level is undulating, a safe and even path may be difficult to achieve in proximity to these trees, without impact on tree roots. The paths should either follow the existing gradients, or 'bridge' existing depressions. This should be subject to more detailed investigation to ensure the construction methods adopted will not adversely affect the tree.



Figure 25 GLADES BAY PARK

Northern section of park, looking east towards York Street (obscured in background). These trees are growing adjacent to the turning circle of Glades Avenue.



Figure 26 GLADES BAY PARK

Near intersection of Linsley and York Streets, looking southeast towards park entrance (yellow arrow).

- 3.7.3 The proposed path avoids the watercourse and vegetation shown in Figure 26. The land falls steeply to the southwest, (other side of vegetation in photograph), so the proposed path meets up with the existing path that begins where the yellow arrow indicates.
- 3.7.4 There is an existing concrete path through the park which meets Delmar Parade to the south (Figure 27). Some sections have been recently repaired or are undergoing repairs. The damage does not appear to be tree root related, as existing trees are generally well set back from the path.

Any widening of the path in the future would need to ensure that works within proximity to mature trees should be initially subject to review by an arboriculturist.



Figure 27 GLADES BAY PARK
Looking northeast from southern end of park, near entry from Delmar Parade.
Any path widening through this section will not impact on trees.

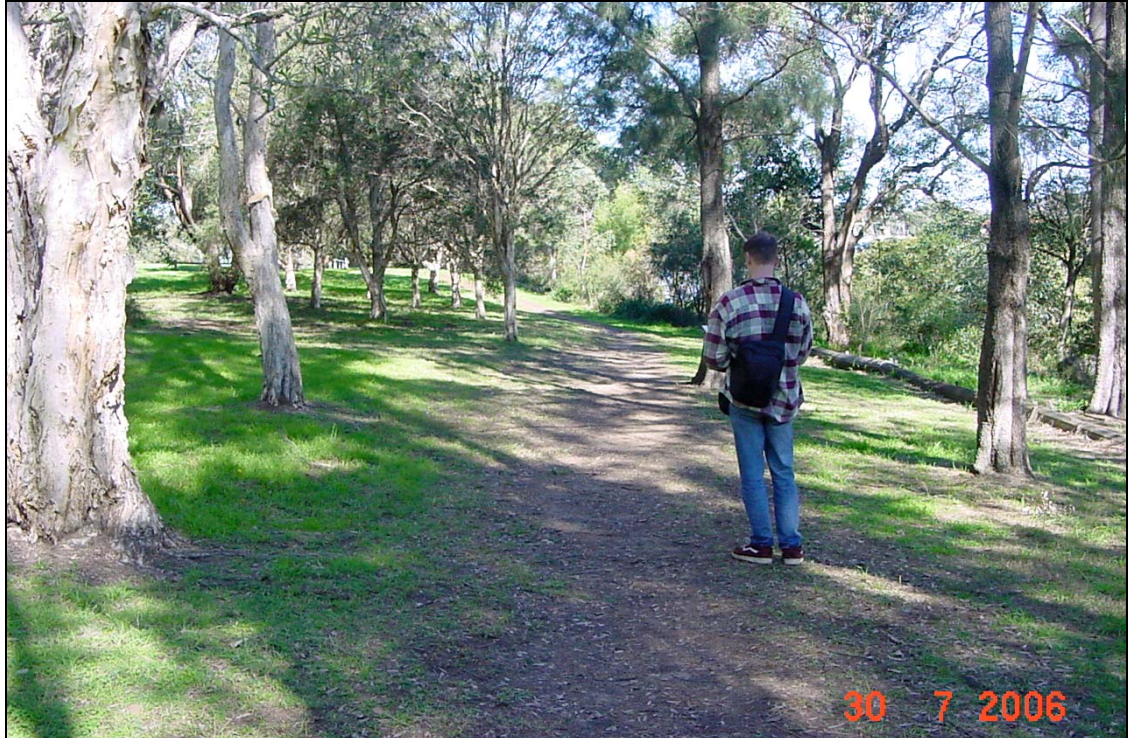


Figure 28 LOOKING GLASS BAY PARK
Southern end of Looking Glass Bay Park. The unformed dirt track links to the north end of Banjo Paterson Park in the background (obscured from view).



Figure 29 LOOKING GLASS BAY PARK

Looking southwest. Tallowwoods (some arrowed) are growing on the east side of the track.

- 3.7.5 A significant, scattered grouping of *Eucalyptus microcorys* (Tallowwood) is located on the east side of the track, opposite a long rock bench (Figure 29). The sandstone benching and trees are located outside the boundaries of the adjacent private properties abutting the park. Where this group of trees begins, I noted the existing dirt track is over unstable, rocky ground. Several large woody roots belonging to Tallowwoods were noted in this area. Some roots have been damaged by past foot and bike traffic.
- 3.7.6 It was noted that the existing, unformed dirt track skirts the edge of a vegetated area, bound by a walking track on the west side of the water course leading to the bay. The vegetation (including areas of what appears to be ongoing revegetation and regeneration works) bound by the east and west paths is quite dense. The water course is protected by this planting on either side. There is no proposed path in this area.
- 3.7.7 Much of the path that links Looking Glass Bay Park with Banjo Paterson Park is edged on the west side with old timber poles, and there are few significant trees to the west, within metres of the existing unformed path.



Figure 30 LOOKING GLASS BAY PARK
Approximate location of existing, unformed dirt track shown in brown.



Figure 31 LOOKING GLASS BAY PARK
Part of the track through Looking Glass Bay Park, linking Banjo Paterson Park to Ashburn Place.

3.7.9 Banjo Paterson Park

As noted, an unformed dirt track links the south end of Looking Glass Bay Park to Banjo Paterson Park. A picnic area, and amenities block are located at the northern end of Banjo Paterson Park. There are existing paths, paved and unpaved, which are generally well clear of existing trees.

Any upgrading of paths, or paving of unformed paths, can be done without impacts on trees. If proposed new paths are to be directed near trees, this could require arboricultural input to determine potential impacts on the trees.

3.7.10 The southern section of the proposed type 1 shared trail skirts around the Banjo Paterson restaurant buildings. There are rock outcroppings which would restrict cycle access from the car park at this point, although there appears to be scope for minor path redesign to create a path loop within the park.

There are some mature trees along the top and bottom of the rock outcropping. Any path construction (and possible rock cutting or excavation) may impact on trees nearby. Arboricultural advice would need to be sought prior to final design.



Figure 32 BANJO PATERSON PARK

Looking northwest towards mangroves. Ample opportunity for a Type 1 shared path.

The yellow star shows the location of a picnic shelter on the upper level. The red arrow indicates the level change between the lower and middle sections in the park.

3.7.11 There is ample area to accommodate a type 1 shared path along the foreshore between a group of Casuarinas just north of the Banjo Paterson wharf, and the trees south of the mangroves. The red arrow in Figure 32 indicates a steep access between the proposed lower path and the existing path above.

An elevated timber stair structure could be located within this area, although some removal of small trees and shrubs would be likely, to accommodate this.

The gradient is such that cycle access from this point is unlikely without bank excavation and increased tree removal.

3.7.12 An alternative is to provide a short loop down to the foreshore which meets the existing path shown in Figure 33.

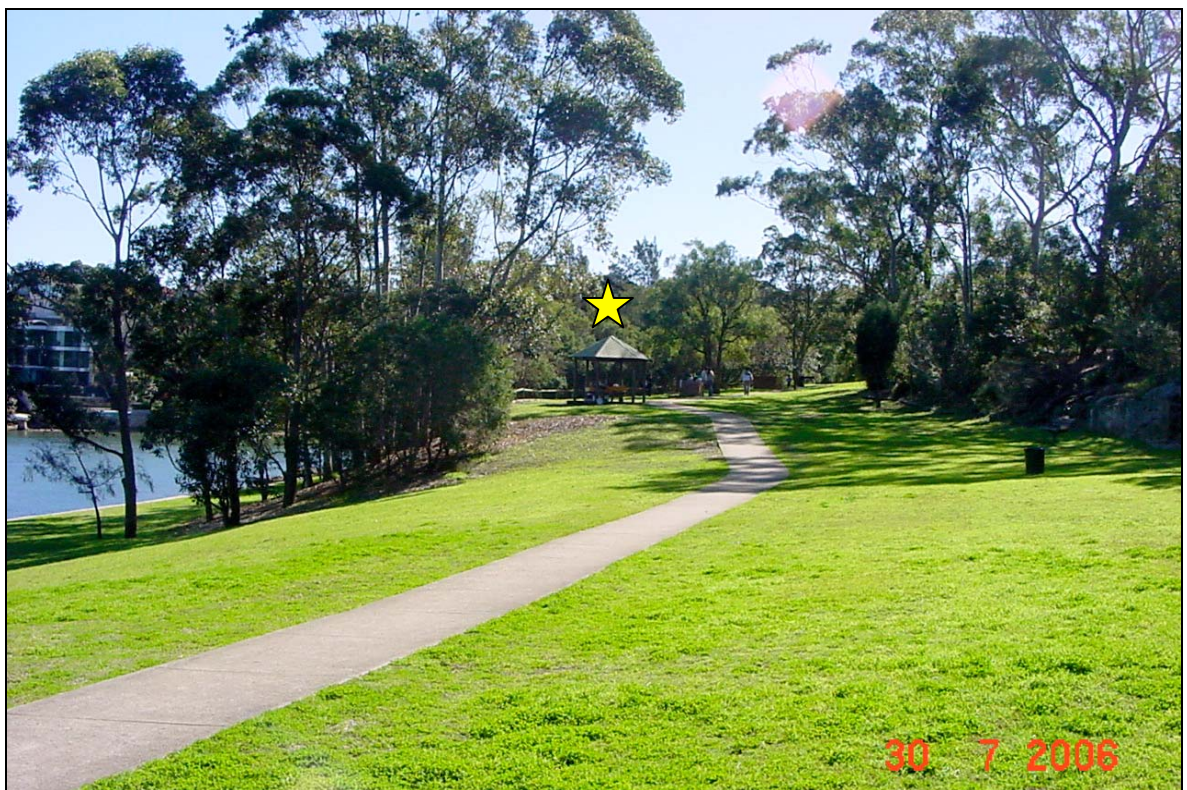


Figure 33 BANJO PATERSON PARK

The existing path is in good condition. Widening of this path in this area will not impact on trees. The yellow star identifies the location of the picnic shelter.

4 RECOMMENDATIONS

4.1 General

4.1.1 Reference should be made to additional recommendations included in the body of this preliminary assessment, which may be specific to individual sections of the proposed river walk.

4.2 Determining the Potential Impacts of Construction near Trees

4.2.1 The advice of an arboriculturist is recommended where construction is to take place within the trees' root zones, as there are many factors which influence the success of the tree after construction. For example, age, species tolerance, level of vigour, structural defects present, location, aspect and soil types, all contribute to the process of evaluating the potential impacts of construction near a tree.
The arboriculturist can provide an informed recommendation as to the most appropriate methods of construction within proximity to the tree.

4.2.2 A useful guideline to follow in preliminary assessment of potential impacts to the tree would be:

- Determine the diameter of the tree trunk at 1.4 metres above existing ground level;
- Multiply that figure by 10.

4.2.3 Any pavement works *inside* that figure must be subject to assessment by an arboriculturist, to determine the most appropriate methods of pavement construction which will not damage, sever, crush or asphyxiate existing roots, nor create a high level of path maintenance as a result of roots damaging the pavement.
Where large or significant trees (e.g. stem diameters of 500mm or more) are located close to a proposed path, or where upgrading of paths, including widening, is proposed, it is crucial that a competent and experienced arboriculturist is retained to advise on the most appropriate design solution to maintain the tree safely, and in good health.

4.3 Other Considerations

4.3.1 Potentially hazardous trees noted in Memorial and Putney Parks should be inspected and assessed by a competent arboriculturist.

4.3.2 When determining the most appropriate methods and materials for pavements near trees it is recommended reference be made to the following publications, in conjunction with an arboriculturist with knowledge of local tree species and their distinctive patterns of root development:

- British Standards Institute 1991, *BS 5837:1991 British Standard Guide for Trees in Relation to Construction*, British Standard Institute.
- Costello, L.R. and Jones, K.S. 2003, *Reducing Infrastructure Damage by Tree Roots – A Compendium of Strategies*, Western Chapter of the International Society of Arboriculture, California.
- Matheny, N.P. and Clark, J.R. 1998, *Trees and Development – A Technical Guide to Preservation of Trees During Land Development*. International Society of Arboriculture, Savoy, Illinois,.



Figure 34 PUTNEY PARK

A significant and visually dominant Fig tree. One of several very large, mature trees in the park.