Arboricultural Impact Assessment

Prepared for Alex Hill
Site Address: 91 Florida Road Palm Beach
18th March 2024

Date	Revision	Change	Stage

Member of Arboriculture Australia, Registered Consulting Arborist No. 1286

Member of International Society of Arboriculture No. 157768

Bachelor of Horticultural Science, University Sydney.

AQF Level 2, 3 & 5 Diploma in Arboriculture

Graduate Certificate AQF Level 8 University Melbourne

Tree Risk Assessment Qualification (TRAQ)

Statement

Bradshaw Consulting Arborists is a company that exclusively provides tree consultancy within the tree industry. There are no conflicts of interests concerning the recommendations outlined in this report.

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Contents

1 Introduction

This report has been prepared by Tristan Bradshaw of Bradshaw Consulting Arborists for Alex Hill for the property 91 Florida Road Palm Beach. The report request was to inspect thirteen trees throughout the property and surrounding properties.

The trees' characteristics have been listed in Table 1 page 6. The aim is to determine the health and condition of the trees and the impact of the proposed development. The inspection of the site was undertaken on 11th March 2024.

The report was completed on 18th March 2024.

See appendix B Section 8 for tree locations and tree protection plan.

The site's trees are managed under Northern Beaches Council's Urban Tree Management Policy.

1.1 Bushfire Constraints

The property is not bushfire prone and not within RFS 10/50 vegetation entitlement clearing area.

1.2 Heritage Constraints

The property is not heritage listed, however it is within the Florida Road heritage conservation area.

1.3 Significant Tree Register

No trees are listed on the significant tree register.

1.4 Vegetation Type classifications and Biodiversity

The property is not mapped on the biodiversity values mapping See figure 1 below.

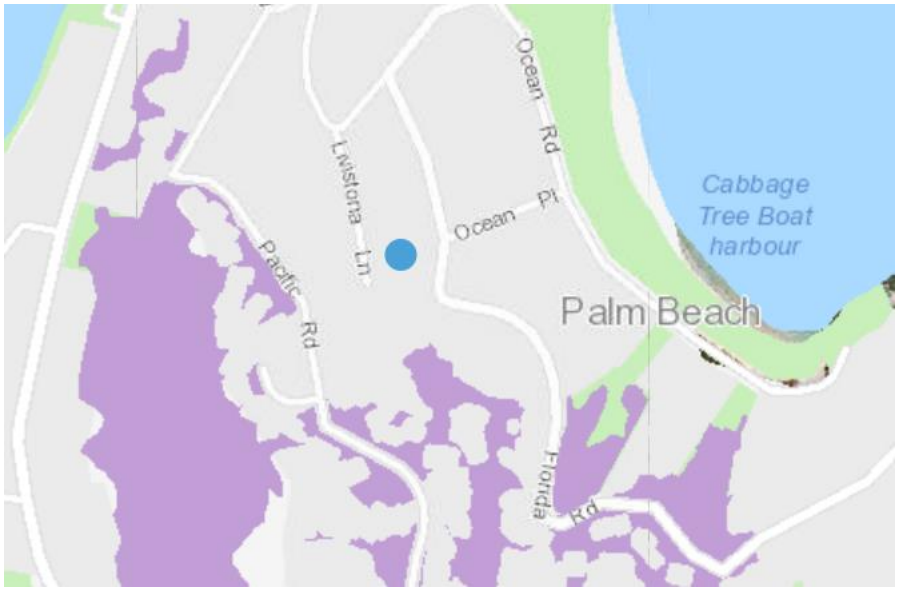

Figure 1 Biodiversity Values Mapping

Figure 2 Mapped existing native vegetation

Vegetation outside of the property is listed as coastal enriched sandstone forest. One of the canopy tree species listed for this forest type is *Syncarpia glomulifera* (Turpentine). Turpentine trees are a species that forms part of this report, however the other species such as *Melaleuca quinquenervia* (Broad Leafed Paperbark) are not endemic and have been planted. The endangered ecological community Pittwater Spotted Gum forest is within this locality but does not appear to be as dominant on the eastern side of the peninsular. It is likely this block was completely cleared when settled and all the vegetation has been replanted since or self-sown such as the Turpentine trees.

1.5 Plans used in this Assessment

Consultant	Company	Date	Revision
Architectural	Robert Jone Architecture	March 2024	

Landscaping, Stormwater, Sewer and electricity plans were not available when this assessment was undertaken. The impacts of these plans have not been assessed.

1.6 The Site

The site is composed of a dwelling and surrounding garden.

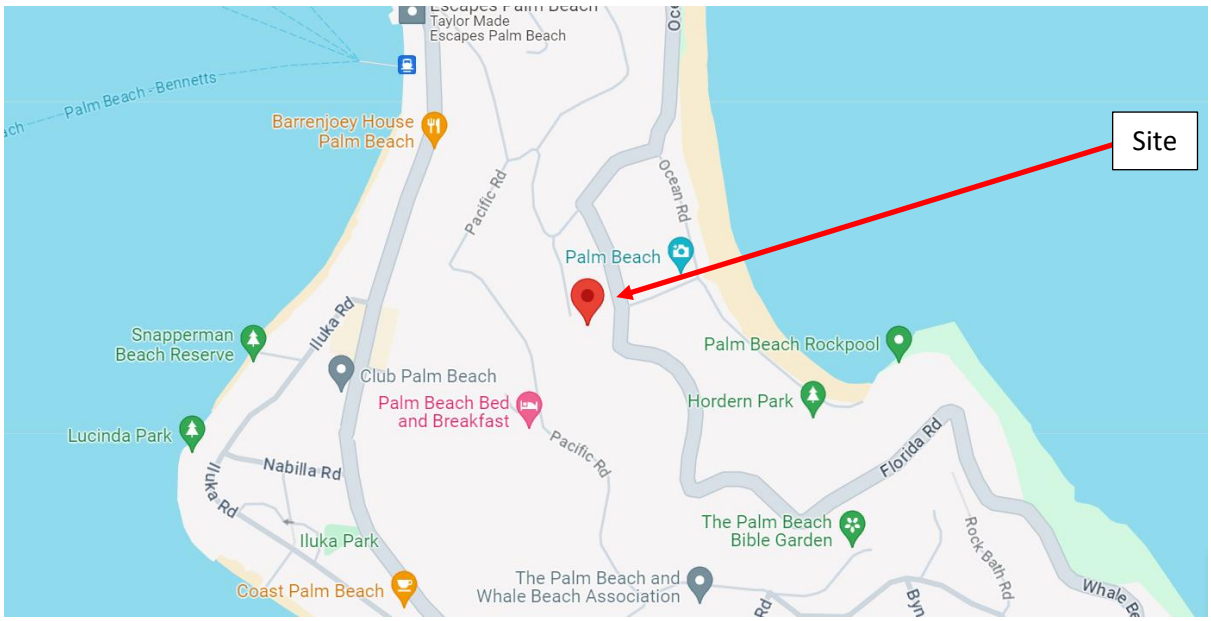

Figure 3 Site location (Google Maps 2024)

1.7 Method

The inspection of the site was undertaken on 11th March 2024.

The inspection method used was the Visual Tree Assessment (VTA) method (Mattheck & Breloer 2010). This method involves inspecting the trees from ground level, using binoculars to aid in identification of any external's signs of decay, physical damage, growth related structural defects and the site conditions where the tree is growing. This method will ascertain whether there is need for a more detailed inspection of any part of the tree. No aerial or subterranean inspections were carried out. See appendix A for the complete flow chart.

The Diameter at Breast Height (DBH) was measured with a diameter tape measure. The height of the measurement was at 140 cm above the ground unless stated.

The height of the tree was estimated.

The canopy spread of the tree was estimated.

Health: Based on vigour, callus development, % of deadwood, dieback, fruiting levels, internode lengths

(E) Excellent

(G) Good

(F) Fair

(P) Poor

(D) Dead

Age Class: (Y) Young=Recently Planted

(S) Semi mature <20% of life expectancy

(M) Mature 20-80% of life expectancy

(O) Over Mature >80% of life expectancy

Condition: Based on the structural integrity of the tree, cavities, fungal decay, branch failure, branch taper, sap or Kino exudate, fruiting bodies, root condition.

(E) Excellent

(G) Good

(F) Fair

(P) Poor

(D) Dead

Landscape Significance and Retention Value see sections 6.2 and 6.3.

Safe Useful Life Expectancy (SULE)

In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. SULE is a system designed to classify trees into a number of defined categories so that information regarding tree retention can be concisely communicated in a non-technical manner. SULE categories are easily verifiable by experienced personnel without great disparity.

A tree's SULE category is the life expectancy of the tree modified by its age, health, condition, safety and location (to give safe life expectancy), then by economics (i.e. cost of maintenance; retaining trees at an excessive management cost is not normally acceptable), effects on better trees, and sustained amenity (i.e. establishing range of age classes in a local population).

SULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with short SULE may at present be making a contribution to the landscape but their value to the local community will decrease rapidly towards the end of this period, prior to their being removed for safety or aesthetic reasons. For details of SULE categories see Appendix A, adapted from Barrell (1993 and 1996).

Visual Habitat

This assessment is based on a visual observation of the tree, included in the VTA method.

Habitat trees are trees that provide microhabitats, these can include hollows, deeply fissured bark, cracks, epiphytes or forms of decay (Bütler, R., Lachat, T., Larrieu, L., & Paillet, Y., 2013).

Tree Protection Zone (TPZ) – A specified area above and below ground and at a given distance from the trunk, set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree that is to be retained where it is potentially subject to damage by development.

Structural Root Zone (SRZ) - The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area.

2 Body Observations Results

Table 1 Individual tree characteristics

Tree Number	*Botanical Name* (Common Name)	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition/ Structure	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ metres)	Tree Protection Zone (TPZ metres)	Percentage TPZ Incursion (AS4970-2009)	Retain or Remove notes
N1	*Syagrus romanzoffiana* (Cocos Palm)	270	270	3	3	3	3	15	G	M	G	15-40	No	Moderate	Moderate	1.9	4	0%	Retain
N2	*Syagrus romanzoffiana* (Cocos Palm)	270	270	3	3	3	3	15	G	M	G	15-40	No	Moderate	Moderate	1.9	4	0%	Retain
1	*Melaleuca quinquenervia* (Broad Leafed Paperbark)	509	550	3	0	7	0	11	G	M	F	>40	No	Moderate	Moderate	2.6	6.1	0%	Retain
2	*Melaleuca quinquenervia* (Broad Leafed Paperbark)	477	500	3	3	7	0	10	G	M	F	>40	No	Moderate	Moderate	2.5	5.7	9.7% garage	Retain
3	*Acacia pycantha* (Golden wattle)	310	310	3	3	3	3	8	P	M	F	<5	No	Moderate	Very Low	2.0	3.7	100% Garage entry	Remove
4	*Phoenix canariensis* (Canary Island Date Palm)	600	600	4	4	4	4	14	G	M	G	>40	No	Moderate	Moderate	2.7	7.2	100% Garage entry	Remove
5	*Melaleuca quinquenervia* (Broad Leafed Paperbark)	382	400	3	3	0	3	11	G	M	G	>40	No	Moderate	Moderate	2.3	4.6	100% Garage entry	Remove

Tree Number	*Botanical Name* (Common Name)	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition/ Structure	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ metres)	Tree Protection Zone (TPZ metres)	Percentage TPZ Incursion (AS4970-2009)	Retain or Remove notes
6	*Melaleuca quinquenervia* (Broad Leafed Paperbark)	550	600	5	4	7	4	12	G	M	G	>40	No	Moderate	Moderate	2.7	6.6	100% Garage entry	Remove
7	*Syncarpia glomulifera* (Turpentine)	370	400	3	3	3	3	14	F	M	G	5-15	No	Very High	Moderate	2.3	4.4	100% Garage entry	Remove
8	*Syncarpia glomulifera* (Turpentine)	337	370	3	3	3	3	14	P	M	P	<5	No	Very High	Low	2.2	4	12.1% garage	Retain
9	*Syncarpia glomulifera* (Turpentine)	484	500	2	4	5	4	14	F	M	G	5-15	No	Very High	Moderate	2.5	5.8	Maximum of 5%, piers for inclinator	Retain
10	*Syncarpia glomulifera* (Turpentine)	540	600	3	1	5	5	14	P	M	F	<5	No	Very High	Low	2.7	6.5	Maximum of 5%, piers for inclinator	Retain
11	*Syncarpia glomulifera* (Turpentine)	333	370	4	4	4	4	12	G	M	G	>40	No	Very High	High	2.2	4	15.8%	Retain

3 Discussion

This site has approximately 40 trees of significant size. This report only assesses 11 trees on the property that surround the proposed garage and two trees within the neighbouring property.

Of the 40 trees on the property, it is proposed 5 trees are removed for the construction of the garage.

Trees N1, N2 and tree 1 are unaffected by the proposal and will be retained and protected.

The encroachment into the TPZ of trees 2, 9 and 10 is less than 10% and this conforms to AS4970-2009. These trees will be retained and protected during construction. Piers for the inclinator will cause little root damage but must be hand excavated to a depth of 600mm to determine the roots that may be severed. Should tree roots greater than 50mm be encountered the pier will have to be moved.

The encroachment into the TPZ for trees 8 and 11 is marginally greater than the acceptable 10%. To compensate for the additional loss of the trees' root structure the TPZ around these trees must have irrigation installed and 75mm of mulch applied over the soil surface. The irrigation must be attached to a computerised system, times set by the project arborist and soil moisture levels monitored by the project arborist. The use of the irrigation will compensate for the additional root loss. Reducing stages when the soil profile is dry would normally create stress therefore removing this stress will allow the tree to grow new tree roots and maintain its root: shoot equilibrium. These trees will be retained, protected and monitored by the project arborist.

It is proposed trees 3, 4, 5, 6 and 7 are removed.

Tree 3 is an Acacia that has self-sown and is in clear decline. This tree has dieback and is not likely to live for more than 5 years.

Tree 4 is a palm tree that is an undesirable exempt species within the Northern Beaches council. It is however within a heritage conservation area and within the road reserve. The species of palm is not naturally occurring and will frequently self-seed throughout the area. Due to the low significance of this palm, it is proposed this tree is removed rather than other trees of significance within the road reserve.

It is proposed trees 5 and 6 are removed. These trees have been planted and are not part of the naturally occurring species in the area. It is preferable that this species of tree is removed compared to the naturally occurring *Sycarpia glomulifera* (Turpentine).

Tree 7 is a *Syncarpia glomulifera* (Turpentine), only one Turpentine is proposed to be removed for this proposal. The tree is in fair health with a low SULE of 5-15 years.

The location of the garage has been chosen as it will cause the least impact to the existing trees on the property. The trees to the south are of greater significance than those trees in the north of the property. Particularly trees 3 and 4 are of low significance.

4 Recommendations

1. Removal of trees 3, 4, 5, 6 and 7.
2. Retain trees N1, N2, 1, 2, 8, 9, 10 and 11.
3. Tree removal should be conducted by an Arborist with a minimum (Australian Qualification Framework) AQF level 3.
4. Work must be undertaken as per the Code of Practice Amenity Tree Industry 1998 and AS4373-Pruning of Amenity trees.
5. The tree removal/pruning process and staff should be skilled and undertake the removal of the tree as per the minimum industry standards.
6. Appoint project arborist. Minimum AQF Level 5 with 5 years' experience.
7. All trees must be retained and protected in accordance with Australian Standard 4970-2009. A tree protection plan has been provided as a guide in section 8. Tree protection fencing and trunk protection is required. See Section 10 Appendix G for generic specifications for these tree protection measures.
8. Services such as electrical/stormwater/sewer/telecommunications have not been assessed at this stage. All services should be routed outside of the TPZ as indicated in Table 1, if this is unavoidable, we must be notified to re-assess this proposed development.

5 Project Arborist Monitoring Stages

The list of monitoring stages are imperative to the long term health of those trees to be retained. The principal contractor (Site Builder) should be informed of these requirements as they often form the basis of the conditions of consent for the project. The stages set out below are a minimum requirement to aid in ensuring the long-term health of any tree recommended for retention on the site.

Stage	Action/Task	What is required
1	Ensure tree protection has been installed as per tree protection plan section 8. This include 75mm of organic mulch and automated watering system around trees 8 and 11.	Tree Protection Certification.
2	Project arborist must be present during excavation within the TPZ of trees 2, 8 and 11.	Provide documentation of works, ensuring that tree roots are cut cleanly and backfilled immediately.
3	Project arborist must be present during pier installations for the inclinator.	Provide documentation of works, ensuring that tree roots are cut cleanly and backfilled immediately.
4	Final certification summarises the attendance to the site and reason for attendance. Comment on the likely long-	Final certificate supplied for occupation certificate.

	term health of the retained trees. Provide any ongoing recommendations.	

6 References

1. Bütler, R., Lachat, T., Larrieu, L. and Paillet, Y., 2013. 2.1 Habitat trees: key elements for forest biodiversity. *Integrative approaches as an opportunity for the conservation of forest biodiversity*, p.84.
2. Australian Standard, A.S., 4970, 2009. *Protection of trees on development sites,* Sydney.
3. Australian Standard A.S., 4373-2007. *Pruning of Amenity Trees, 2007,* Sydney
4. https://www.google.com/maps/place/91+Florida+Rd,+Palm+Beach+NSW+2108/@-33.5993815,151.322912,16z/data=!3m1!4b1!4m6!3m5!1s0x6b0d52ad914c0013:0xfaf3ddd824350525!8m2!3d-33.5993815!4d151.322912!16s%2Fg%2F11cp9kp_hb?entry=ttu. Viewed 18th March 2024.
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8. RFS 10/50. https://www.rfs.nsw.gov.au/plan-and-prepare/1050-vegetation-clearing/tool. Viewed 18th March 2024.
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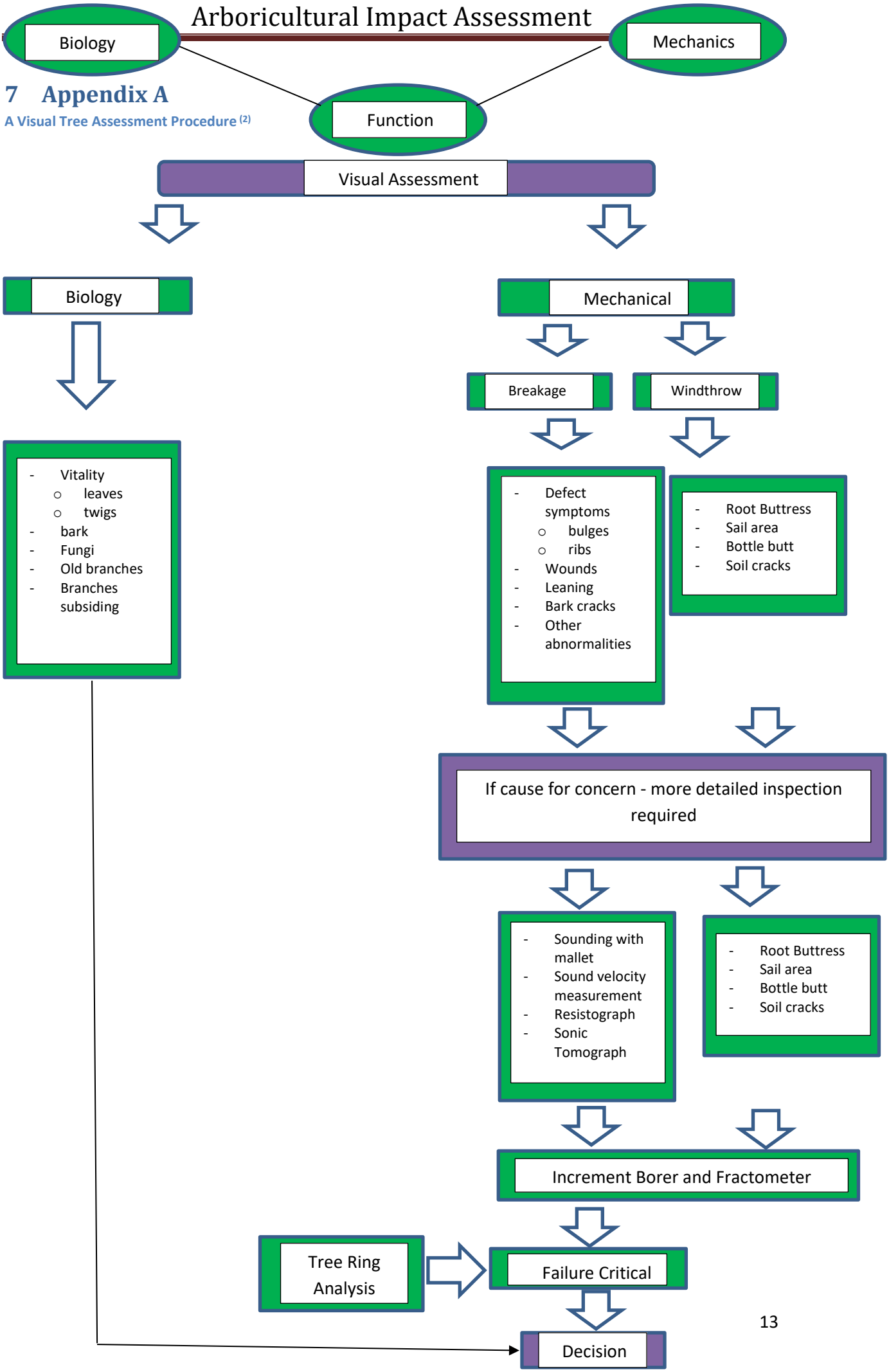
7 Appendix A

A Visual Tree Assessment Procedure [2]



8 Appendix B Tree locations and Tree Protection Plan Scale 1:200

Table 1 Plan Legend

Requirement	Total	Tree Number	Legend
Trees Removed	5	3,4,5,6,7	Red
Trees Retained	8	N1,N2,1,2,8,9,10,11	Green
Tree Protection Zone (TPZ)			
Tree protection fencing	1	2	

9 Appendix C Methodology for Determining Tree Retention Value

The aim of this process is to determine the relative value of each tree for retention (i.e. its Retention Value) in the context of development. This methodology assists in the decision-making process by using a systematic approach. The key objective of process is to ensure the retention of good quality trees that make a positive contribution to these values and ensure that adequate space is provided for their long term preservation. The Retention Value of a tree is a balance between its sustainability in the setting in which it is located (the 'landscape') and its significance within that setting (landscape significance).

Step 1: Determining the Landscape Significance Rating

The 'landscape significance' of a tree is a measure of its contribution to amenity, heritage, and ecological values. While these values are fairly subjective and difficult to assess consistently, some measure is necessary to assist in determining the Retention Value of each tree. To ensure in a consistent approach, the assessment criterion shown in Table 2 should be used. A Tree may be considered 'significant' for one or more reasons. A tree may meet one or more of the criteria in any value category (heritage, ecology or amenity) shown in Table 2 to achieve the specified rating. For example, a tree may be considered 'significant' and given a rating of 1, even if it is only significant based on the amenity criteria.

Based in the criterion in this table, each tree should be assigned a landscape significance rating as follows:

1. Significant
2. Very High
3. High
4. Moderate
5. Low
6. Very Low
7. Insignificant

Step 2: Determining Safe Useful Life Expectancy (SULE)

The sustainability of a tree in the landscape is a measure of its remaining lifespan in consideration of its current health, condition and suitability to the locality and site conditions. The assessment of the remaining lifespan of a tree is a fairly objective assessment when carried out by a qualified Consulting Arborist. Once a visual assessment of each tree is completed (using the Visual Tree Assessment criteria), the arborist can make an informed judgement about the quality and remaining lifespan of each tree. The Safe Useful Life Expectancy (SULE) methodology (refer to Table 3) can be used to categorise trees as follows:

- Long (Greater than 40 years)
- Medium (Between 15 and 40 years)
- Short (Between 5 and 15 years)
- Transient (less than 5 years)
- **Dead or Hazardous (no remaining SULE)**

The SULE of a tree is calculated based on an estimate of the average lifespan of the species in an urban area, less its estimated current age and then further modified where necessary in consideration of its current health, condition (structural integrity) and suitability to the site.

9.1 Appendix D Table 2 Step 1 Landscape Significance Rating

RATINGS	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1. SIGNIFICANT	The subject tree is listed as a Heritage item under the Local Environment Plan (LEP) with a local, state, or national level of significance or is listed on Council's Significant Tree Register.	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conversation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999.	The subject tree has a very large live crown size exceeding 100m2 with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species.
	The subject tree forms part of the curtilage of a Heritage Item (building/structure/artefact as defined under the LEP) and has a known or documented association with that item.	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species.	The Subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity.
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event.	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area.	The tree is visually prominent in view form surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally indigenous species representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 60m2, a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence.	The tree is a locally indigenous and representative of the original vegetation of the area and the tree is located within a defined vegetation link/wildlife corridor or has known wildlife habitat value.	The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal); The subject tree is visible form the street and/or surrounding properties and makes a positive contribution to the visual character and the amenity of the area.
4. MODERATE	The tree has no known or suspected historical association but does not detract or diminish the value the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of the DCP.	The subject tree has a medium live crown size exceeding 25m^2; The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal).
			The tree is visible from surrounding properties but is not visually prominent- view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values and diminishes the value of the heritage item.	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown of less than 25m^2 and can be replaced within the short term (5-10 years) with new tree planting.
6. VERY LOW	The subject tree is causing significant damage to a heritage item.	The subject tree is listed as an Environment Weed Species in the Local Government Area, being invasive, or is a nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50%.

9.2 Appendix E Table 3 Estimating Safe Useful Life Expectancy (SULE) Step 2

1	Estimate the age of the tree
2	Establish the average life span of the species
3	Determine whether the average life span needs to be modified due to local environmental situation
4	Estimate remaining life expectancy

Life Expectancy	=	average modified life span of species - age of tree

5	Consider how health may affect safety (& longevity)
6	Consider how tree structure may affect safety
7	Consider how location will affect safety
8	Determine safe life expectancy

Safe Life Expectancy	=	life expectancy modified by health, structure and location

9	Consider economics of management (cost vs benefit of retention)
10	Consider adverse impacts on better trees
11	Consider sustaining amenity - making space for new trees
12	Determine SULE

Safe Useful Life Expectancy	=	safe life expectancy modified by economics, effects on better trees and sustaining amenity

Ref: Barrell, Jeremy (1996)
Pre-development Tree Assessment
Proceedings of the International Conference on Trees and Building Sites (Chicago)
International Society of arboriculture, Illinois, USA

9.3 Appendix F Table 4 Determining Tree Retention Values

The Retention Value of a tree is increased or diminished based on its sustainability in the landscape, which is expressed as its SULE. A tree that has a high Landscape Significance Rating, but low remaining SULE, has a diminished value for retention and therefore has an appropriate Retention Value assigned. Conversely a tree with a low Landscape Significance Rating even with a long remaining SULE, is also considered of low Retention Value. This logic is reflected in the matrix shown in Table 1.

Once the landscape Significance Rating and SULE category have been determined, the following matrix can be used to determine a relative value (or priority) for retention:

TABLE 1 – DETERMINING TREE RETENTION VALUES

	Landscape Significance Rating						
SULE	1	2	3	4	5	6	7
Long - greater than 40 years	High Retention Value						
Medium - 15 to 40 years			Moderate Retention Value				
Short - 5 to 15 years				Low Retention Value			
Transient - less than 5 years				Very Low Retention Value			
Dead or Hazardous							

10 Appendix G Tree Protection specifications

Tree Protection Fencing (See Figure 4 below)

Tree protection must be undertaken for all trees to be retained on site or surrounding it.

All fencing should be at the perimeter of the Tree Protection Zone (TPZ), unless shown on Tree Management Plan (TMP).

The tree/s to be retained and protected together with their relevant Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) shall be marked on all demolition and construction drawings.

All contractors and workers on site shall be briefed on the tree protection and management procedures in place as part of their site induction. A written record of the induction process is to be kept on site.

The TPZ must be enclosed with a fully supporting chainmesh protective fencing. The fencing shall be secure and fastened to prevent movement. The fencing shall have a lockable opening for access. Roots greater than 30mm diameter are not to be damaged/severed during the construction of the fence. See Figure 4 Drawing taken from AS 4970-2009below.

The enclosed area must be free of weeds and grass, the application of a 75mm layer of leaf mulch to the tree protection zone (TPZ) must be maintained for the duration of works.

Signs at 7 metre intervals are to be attached to the fencing clearly showing the name and contact details of the Project Arborist and the words NO ENTRY TREE PROTECTION ZONE.

No work is to be undertaken within this Tree Protection Zone; this includes:

-No removal or pruning of trees.

-No construction, stockpiling or storage of chemicals, soil, and cement. Or the movement of machinery, parking and personnel is to occur within the TPZ unless ground protection has been installed.

-No refuelling, dumping of waste, placement of fill or Soil level changes.

-No lighting of fires or physical damage to protected trees.

-No temporary or permanent installation of utilities or signs.

-No service trenches should pass through the TPZ, stormwater pits must be located outside the TPZ.

Example of tree protection fencing

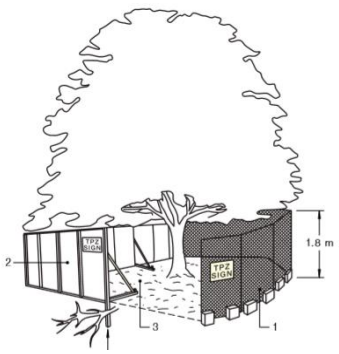
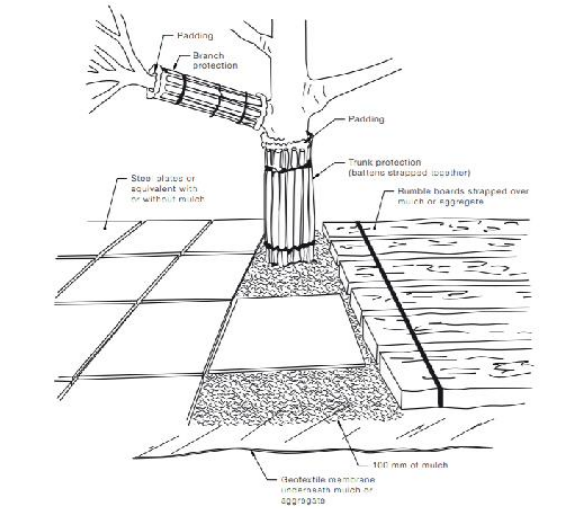


Figure 4 Drawing taken from AS 4970-2009



NOTES:

1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.

2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

Figure 5 Trunk and branch Protection (AS 4970-2009)

Figure 6 Trunk Protection

10.1 Trunk/Branch Protection

Hessian or similar material is used as a wrap around the trunk/branch to a height of 2.6 metres from the base of the tree. Covering the hessian are timbers 100x50x2200mm These are to be spaced around the trunk with gaps of approximately 100mm. The timbers are to be secured with metal strapping. These materials are not to be directly fastened to the tree. See Figure 5 and Figure 6 above.

10.2 Ground protection

This is used to protect the Tree Protection Zone (TPZ) from soil compaction. Soil compaction reduces the available pore spaces within the soil, this reduces water holding capacity, oxygen and carbon dioxide diffusion. It can cause water to runoff the soil surface reducing infiltration. Over time a root system in a compact soil (High Bulk Density) declines. As the root system of a tree declines so does its canopy. When soil compaction is severe the entire tree can die.

Where scaffolding, foot traffic or wheelbarrow access is required. The soil surface should be covered by Geotextile fabric followed by plywood sheets 1.2 x 2.4 metres x 18mm thick and then covered by 200mm of mulch to provide a trafficable surface. Timber slats may be required to provide grip to the surface. Driveways or areas that will have heavy vehicles over the soil surface should have geotextile fabric, 100mm of mulch or gravel followed by sleepers 100x 200 x 3000mm. The sleepers are spaced 150mm apart and the gaps filled with gravel or mulch. The sleepers are then strapped together with metal hoop pine to prevent movement.

Irrigation may be required beneath ground protection.

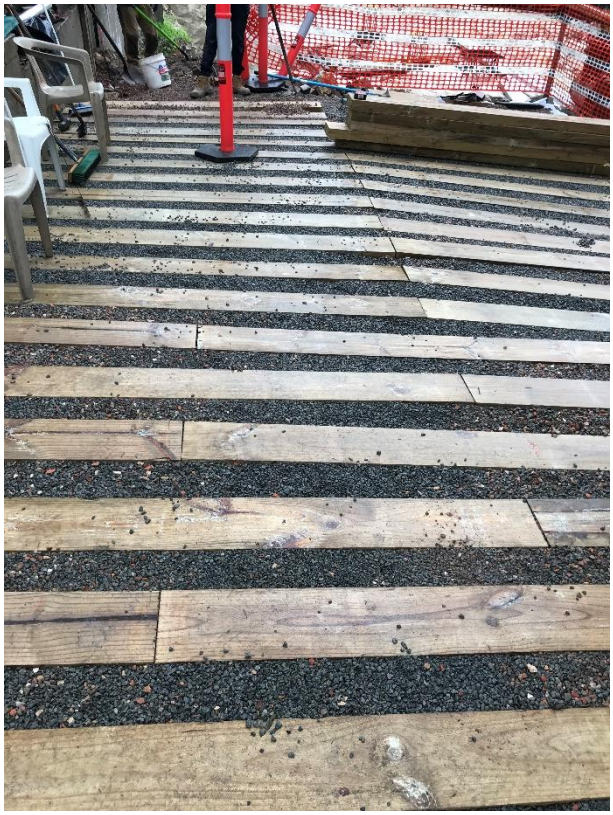


Figure 7 Sleepers with gravel between protecting ground from compaction

10.3 Installation of underground services

All underground services must be routed outside the TPZ of any protected tree. The project arborist must be consulted (or council if required in DA conditions) if works pass through the TPZ of any tree. Methods such as thrust boring/directional drilling or hand excavation, during supervision by the project arborist are methods that reduce impact to surrounding trees. These are acceptable methods under AS 4970-2009.

11 Glossary of Terms

AGL: above ground level

Basal flare: the rapid increase in diameter that occurs at the confluence of trunk and root crown, associated with both stem and root tissue.

Canopy Spread: measure from one side of the tree to the other, the canopy spread of the tree was estimated.

Condition: refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Decay: is the result of invasion by fungal diseases through a wound.

Decline: is the response of the tree to a reduction of energy levels resulting from stress. Recovery from a decline is difficult and slow; is usually irreversible.

Diameter at Base (DAB): A measurement at the base of the tree above any significant swelling.

Diameter at Breast Height (DBH)[(4)]: refers to the tree trunk diameter at breast height (1.4 metres above ground level) Estimated

Dieback: refers to the withdrawal of energy by the tree from some areas of the crown. Symptoms are leaf drop, bare twigs, dead branches and tree death, in order of progression. This can be caused by root damage, root disease, severe bark damage, intensive grazing by insects, abrupt changes in growth conditions, drought, water logging or over maturity. Dieback often implies stress or decline.

Epicormic shoots: are sprouts produced from dormant buds in the bark. Production can be triggered by fire, pruning or root damage but may also be as a result of stress or decline.

Future: A time period of 12 months from the date of report. As described by the Land and Environment Court.

Hazard: refers to anything with the potential to harm health, life or property.

Height of tree: refers to the height of the tree from ground level to the highest point of the tree. This is estimated with the use of a clinometer.

Health: refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback. Listed as Excellent, Good, Fair or Poor.

Inclusion: See weak junctions

Sparse crown: refers to reduced leaf density, often a precursor to dieback and may imply stress or decline. Also, possibly a response to drought or root damage.

Topping: or heading is a pruning practice that results in removal of terminal growth leaving a cut stub end. Topping causes serious damage to the tree.

Weak junctions: are points of possible failure in the scaffold. They are usually caused by the trunk or branch bark being squeezed within the junction so that the necessary interlocking of the wood fibres does not occur, and the junction is forced open by the annual increments in growth. This is often a genetic problem.

Weed species: are plants that are known to invade native remnant bushland. The species concerned may be exotic or may be native species from other parts of Australia.

Wounds: are areas where the bark has been damaged by branch breakage, impact or insect attack. Some wounds decay and cause structural defects or weakness. Healthy trees are able to resist and contain infection by walling off areas within the wood. Tree wounds are often eventually covered over by new bark but the walled off or infected areas still remain internally and may lead to weakness of the heartwood.

12 Qualifications and Experience

TRISTAN BRADSHAW

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Consulting Arborist Registered Number 1286

Professional Memberships

Member of the International Society of Arboriculture. No: 157768

Member of Arboriculture Australia No. 1286 (Certified Practicing Consulting Arborist)

Qualifications

2022 Tree Risk Assessment Qualification renewal (TRAQ)

2016-2018 Graduate Certificate in Arboriculture AQF8 at Melbourne University.

2015 Tree Risk Assessment Qualification (TRAQ)

2013-2014 Diploma of Arboriculture AQF5 at Ryde TAFE. Distinction

2012 Certificate III in Arboriculture at Ryde TAFE

2011 Certificate IV in Occupational Health and Safety

2010 Aboriginal Sites Awareness Course by Aboriginal Heritage Office

1996-1999 Bachelor of Horticultural Science at University of Sydney. Honours+

Tristan Bradshaw has been involved in the Horticultural and Arboricultural Industry since 1995. The business Bradshaw Horticultural Services was formed and incorporated Horticultural consulting work and landscaping. In 2000 Tristan undertook the Level 2 Arboriculture course at Ryde TAFE. The business progressively specialised in consulting, tree removal, pruning and stump grinding works. Extensive hands-on knowledge was developed during the climbing of trees undertaking pruning or removal and during storm events understanding the tolerances of trees.

In 2009 the new business name Bradshaw Tree Services was registered to reflect works only being undertaken in the tree industry. The business operated throughout Sydney employing up to 25 people. Tristan Bradshaw's main role was as a consultant advising clients and writing reports. In 2019 Bradshaw Tree Services ceased operations and Tristan Bradshaw began Bradshaw Consulting Arborists exclusively undertaking tree consultancy.

Tristan Bradshaw with continued education has attained a Level 8 qualification, attends the annual Arboriculture conferences taking part in the seminars to broaden his knowledge.

This assessment was carried out from the ground and covers what was reasonably able to be assessed and available to this assessor at the time of inspection. No subterranean inspections were carried out. The preservation methods recommended where applicable are not a guarantee of the tree survival but are designed to reduce impacts and give the trees the best possible chance of adapting to new surroundings.

Limitations on the use of this report:

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole or the original report is referenced in, and directly attached to that submission, report or presentation.

Assumptions:

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible: however, Bradshaw Consulting Arborists can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

-Information contained in this report covers only the tree/s that was/were examined and reflects the condition of the tree at the time of the assessment: and
-The inspection was limited to visual examination of the subject tree without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.
-The assessment does not identify hazards and associated risk; this report is not a risk assessment.

Yours sincerely,

Tristan Bradshaw

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