

# Arboricultural Impact Assessment

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Prepared for Wimbledon Pty Ltd  
Site Address: 2A Allen Avenue Bilgola Beach  
22<sup>nd</sup> November 2024

Date	Revision	Change	Stage
12/6/2023	1	Plans	DA
22/11/2024	2	Plans	DA

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## 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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## 1 Introduction

This report has been prepared by Tristan Bradshaw of Bradshaw Consulting Arborists for Wimbledon Pty Ltd at the property 2A Allen Avenue Bilgola. The report request was to inspect seventeen 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 31<sup>st</sup> May 2023.

The report was completed on 12<sup>th</sup> June 2023 and updated on the 22<sup>nd</sup> November 2024 Revision 2.

See appendix B Section 8 for tree locations and tree protection plan. Tree locations were measured on site and have been estimated on the survey plan.

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

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

No trees are listed on council's significant tree register, however Trees 3 and 4 Canary Island date Palms that are within the road reserve are heritage listed.

The property is not mapped as having Terrestrial Biodiversity.

### 1.1 Plans used in this Assessment

Consultant	Company	Date	Revision
Architectural	Ursino Architects	25/10/2024	A

### 1.2 The Site

The site is composed of a dwelling and surrounding garden.



Figure 1 Site location (Google Maps 2023)

### 1.3 Method

The inspection of the site was undertaken on 31<sup>st</sup> May 2023.

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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

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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.

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## 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)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove notes
1	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	200	200	2	2	2	2	3	F	S M	G	>40	No	Low	Moderate	1.5	3	0%	Retain
2	<i>Strelitzia nicolai</i> (Giant Bird of Paradise)	Multiple	1000	3	3	3	3	6	G	M	G	>40	No	Low	Moderate	1.5	4	0%	Retain
3	<i>Phoenix canariensis</i> (Canary Island date Palm)	620	620	3	3	3	3	14	F	M	E	>40	No	Significant	High	2	4	0%	Retain
4	<i>Phoenix canariensis</i> (Canary Island date Palm)	570	570	3	3	3	3	14	F	M	E	>40	No	Significant	High	2	4	0%	Retain
5	<i>Howea forsteriana</i> (Kentia Palm)	160	160	2	2	2	2	4	G	S M	G	>40	No	Low	Moderate	1.5	3	0%	Retain
6	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	170	300	1	1	1	1	3	G	S M	G	>40	No	Low	Moderate	1.5	2	23.7% driveway	Retain
7	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	270	350	2	2	2	2	12	G	M	G	>40	No	Low	Moderate	1.5	3	32% driveway	Retain

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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)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove notes
8	<i>Livistonia australis</i> (Cabbage Tree Palm)	320	500	2	2	2	2	6	G	M	G	>40	No	High	High	1.5	3	32% driveway	Retain
9	<i>Washingtonia robusta</i> (Mexican Fan Palm)	300	300	0	0	0	0	1 3	DE AD				No	DEAD	Very Low	NA	NA	0%	Retain
10	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	250	250	3	3	3	3	9	G	M	G	>40	No	Low	Moderate	1.8	4	100% Building	Remove
11	<i>Phoenix canariensis</i> (Canary Island date Palm)	600	600	4	4	4	4	8	G	M	G	>40	No	Low	Moderate	2.7	5	0%	Retain
12	<i>Agonis flexuosa</i> (Willow Myrtle)	400	400	4	4	4	4	5	F	M	G	15-40	No	Low	Low	2.3	4.8	0%	Retain
13	<i>Musa</i> sp. (Banana)	Multiple	1000	2	2	2	2	5	F	M	G	15-40	No	Low	Low	1.5	3	100% Building	Remove
14	<i>Viburnum odoratissimum</i> (Sweet Viburnum) x 8	150	150	1	1	1	1	2	F	M	G	5-15	No	Low	Very Low	1.5	2	0%	Retain
15	<i>Strelitzia nicolai</i> (Giant Bird of Paradise)	400	400	2	2	2	2	7	G	M	G	>40	No	Low	Moderate	2.3	3	0%	Retain

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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)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove notes
16	<i>Strelitzia nicolai</i> (Giant Bird of Paradise)	400	400	2	2	2	2	7	G	M	G	>40	No	Low	Moderate	2.3	3	0%	Retain
17	<i>Plumeria rubra</i> (Frangipani)	150	150	3	3	3	3	4	G	M	G	>40	No	Low	Moderate	1.5	2	100% Building	Remove

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## 3 Discussion

Seventeen trees have been included in this assessment.

Trees 1, 2, 3, 4 and 5 are located on the road reserve at the front of the property.

Trees 6, 7, 8, 9, 11, 12, 14, 15, 16 are located on neighbouring properties.

Trees 10, 13 and 17 are located on the property.

### **Trees 1, 2, 3, 4 and 5**

Trees 1, 2 and 5 are unaffected by the proposal and will be retained and protected for the duration of the development.

Trees 3 and 4 are of heritage significance and a high priority for retention. The proposed front wall and new driveway are replacing existing structures. These structures will not affect the heritage palms. They will be retained and protected for the duration of the project.

### **Trees 6, 7, 8, 9, 11, 12, 14, 15, 16**

Trees 6, 7, 8 and 9 are located in the adjacent property 2 Allen Avenue. Tree 9 is dead and not a constraint to this development.

Trees 6, 7 and 8 are beside the proposed driveway. An existing driveway is present and is likely to restrict root growth below it. However, the new driveway is proposed lower, it descends to the garage. These palms are located approximately 700-800mm from the boundary. This calculates a 23.7-32% TPZ encroachment for trees 6, 7 and 8. Under AS4970-2009 this is a major encroachment; however, palms are monocotyledons and have a completely different vascular tissue and root structure. They can tolerate significant TPZ incursions and remain viable unlike Dicotyledons such as trees. Palms are readily transplanted with very little root system and survive. Hodel, Pittenger and Downer (2005) make comment that provided the root initiation zone (RIZ) is not damaged (15cm out from the trunk) most palms can be transplanted with a 30cm radial root ball and survive. The study assessed palms *Archontophoenix cunninghamiana* (Trees 6 and 7) and *Livistona decipiens* (same genus as tree 8). The small amount of root system retained is common when tree transplanting. For this development it is proposed the root system of trees 6, 7 and 8 is severed 700-800mm from the centre of the trees. The remainder of the root ball is untouched this significantly reducing any stress to the palms. It is proposed these palms be retained and protected.

Trees 11, 12, 14, 15 and 16 are in the neighbouring properties, behind an existing retaining wall. It is proposed that during excavation piles are drilled down through the existing retaining wall, this prevents damage to the root systems of these trees/palms. These trees will be unaffected by the proposal and will be protected.

The hedge (Tree 14) must be pruned back to fence line and Tree 12 must have minor pruning back to the fence line. These works must be done prior to piling and can be done without council approval as pruning is less than 10% of canopy.

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## Trees 10, 13 and 17

Trees 10, 13 and 17 are exempt and council approval is not required to remove these trees. Tree 10 is a Bangalow palm, Tree 13 are banana trees, Tree 17 is a frangipani of 4 metres in height. It is proposed these trees are removed.

## 4 Recommendations

1. Removal of trees 10, 13 and 17.
2. Retain trees 1-9, 11, 12, 14, 15 and 16.
3. Hedge/Tree 14 must be pruned back to fence line/boundary and Tree 12 prior to piling.
4. Tree removal should be conducted by an Arborist with a minimum (Australian Qualification Framework) AQF level 3.
5. Work must be undertaken as per the Code of Practice Amenity Tree Industry 1998 and AS4373-Pruning of Amenity trees.
6. The tree removal/pruning process and staff should be skilled and undertake the removal of the tree as per the minimum industry standards.
7. Appoint project arborist. Minimum AQF Level 5 with 5 years' experience.
8. 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.
9. Services such as electrical/stormwater/sewer/telecommunications have not been assessed at this stage. It is assumed there will not be any impact as proposed services will be connected at the boundary. The trees of significance are palms and excavation can be conducted within the TPZ without affecting the palm provided the project arborist is onsite.

## 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	Type of Monitoring	What is required
1	Ensure tree protection has been installed as per tree protection plan section 8	Tree Protection Certification
2	Retain crossover and portion of driveway as ground protection. Do not demolish.	Certification that this will be maintained for the duration of the project
3	Any unforeseen works within the TPZ of a retained tree must be supervised by the project arborist.	Document works with photographs and report.

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4	<p>Final certification summarises the attendance to the site and reason for attendance.</p> <p>Comment on the likely long-term health of the retained trees. Provide any ongoing recommendations.</p>	<p>Final certificate supplied for occupation certificate</p>
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## 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.
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4. [https://www.google.com/maps/place/5+Allen+Ave,+Bilgola+Beach+NSW+2107/@-33.6445914,151.3273932,20z/data=!4m15!1m8!3m7!1s0x6b72accd2c023f9b0xa1afd0c8430237b3!2s2+Allen+Ave,+Bilgola+Beach+NSW+2107!3b1!8m2!3d-33.644663!4d151.3271725!16s%2Fg%2F11c4\\_jldcs!3m5!1s0x6b72accd26689361:0xfebb78ab985d9bc!8m2!3d-33.6449355!4d151.3276965!16s%2Fg%2F11bw42jfc?entry=ttu](https://www.google.com/maps/place/5+Allen+Ave,+Bilgola+Beach+NSW+2107/@-33.6445914,151.3273932,20z/data=!4m15!1m8!3m7!1s0x6b72accd2c023f9b0xa1afd0c8430237b3!2s2+Allen+Ave,+Bilgola+Beach+NSW+2107!3b1!8m2!3d-33.644663!4d151.3271725!16s%2Fg%2F11c4_jldcs!3m5!1s0x6b72accd26689361:0xfebb78ab985d9bc!8m2!3d-33.6449355!4d151.3276965!16s%2Fg%2F11bw42jfc?entry=ttu) . Viewed 12<sup>th</sup> June 2023.
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6. NSW Government e planning spatial viewer, 2020. <https://www.planningportal.nsw.gov.au/propertyreports/9de60642-47ca-4f2d-a485-19a7c1d9cbe8.pdf>. Viewed 12<sup>th</sup> June 2023.
7. Northern Beaches trees. <https://www.northernbeaches.nsw.gov.au/planning-development/tree-management/private-land>. Viewed 12<sup>th</sup> June 2023.
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9. Hodel, D.R., Pittenger, D.R. and Downer, A.J., 2005. Palm root growth and implications for transplanting. *journal of Arboriculture*, 31(4), p.171.

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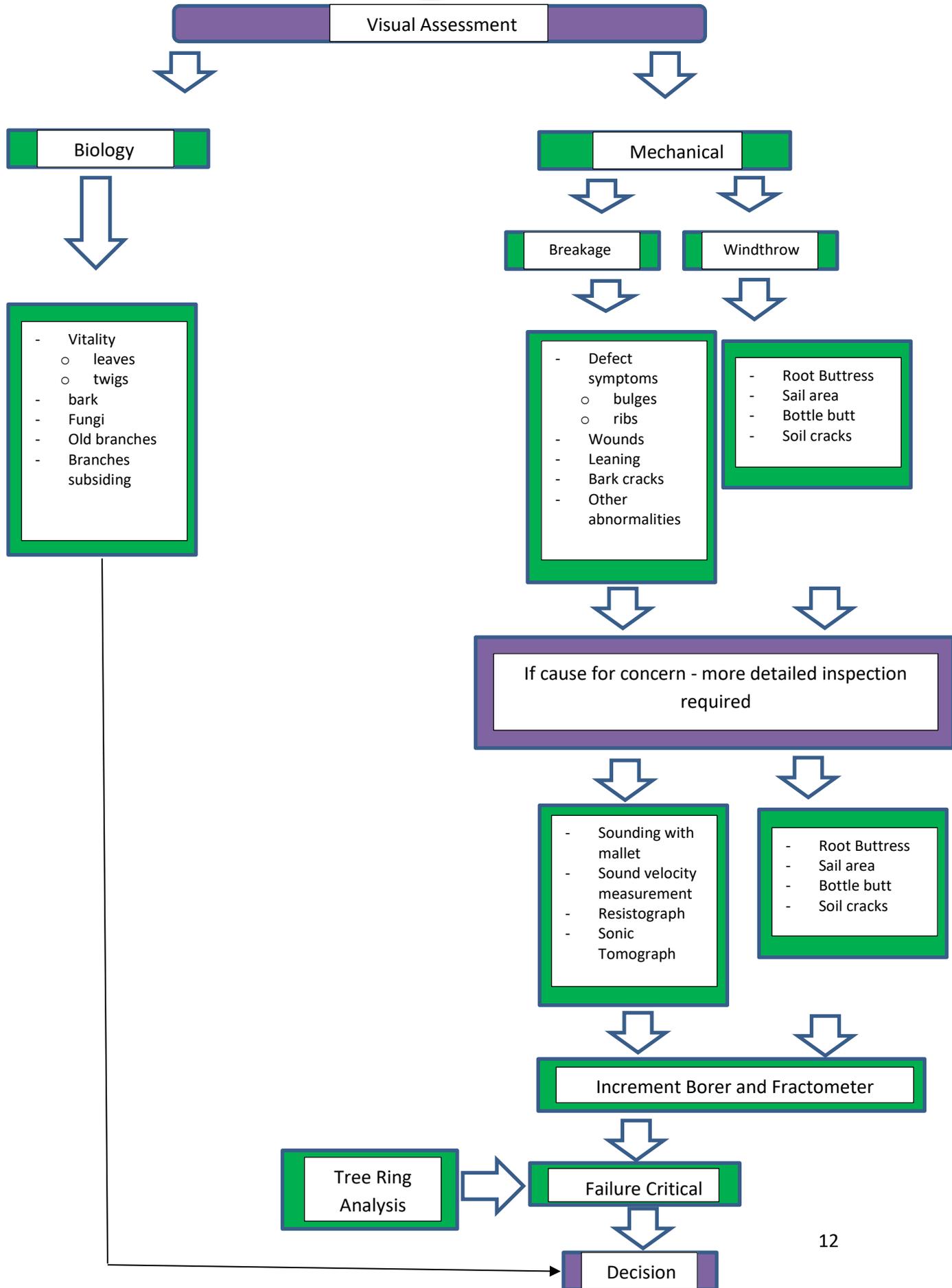
Biology

Mechanics

Function

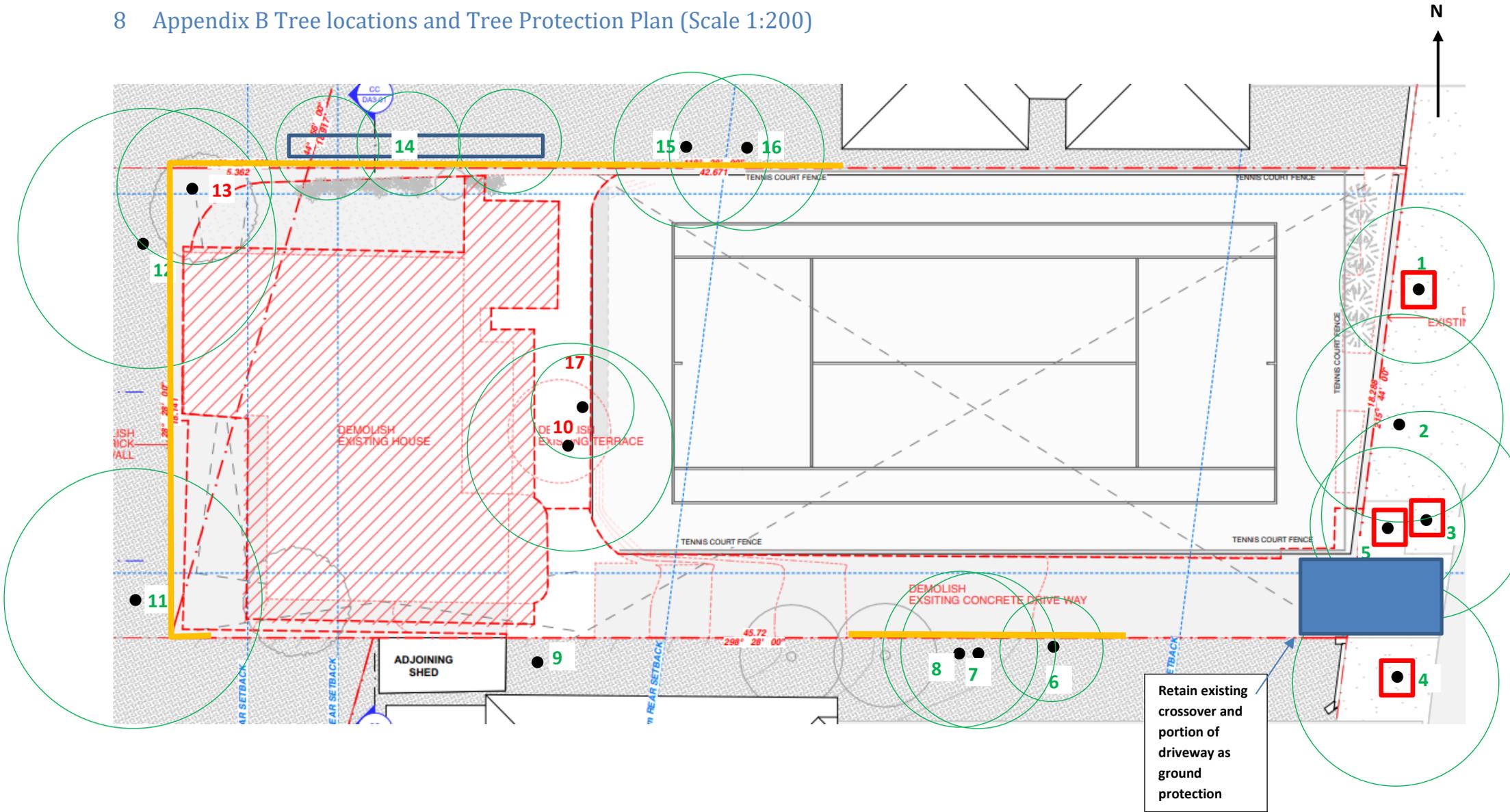
## 7 Appendix A

A Visual Tree Assessment Procedure <sup>(2)</sup>



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



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Table 1 Plan Legend

Requirement	Total	Tree Number	Legend
Trees Removed	3	10, 13, 17	Red
Trees Retained	14	1-9, 11, 12, 14, 15, 16	Green
Tree Protection Zone (TPZ)	17	1-17	
Tree protection fencing	8	6, 7, 8, 11, 12, 14, 15, 16	
Trunk Protection	4	1, 3, 4, 5	
Ground Protection	3	3, 4, 5	

## 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.

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## 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 <sup>2</sup> ; 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 <sup>2</sup> 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%.

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

<b>1</b>	Estimate the age of the tree			
<b>2</b>	Establish the average life span of the species			
<b>3</b>	Determine whether the average life span needs to be modified due to local environmental situation			
<b>4</b>	Estimate remaining life expectancy			
	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;"><b>Life Expectancy</b></td> <td style="text-align: center;">=</td> <td style="text-align: center;">average modified life span of species - age of tree</td> </tr> </table>	<b>Life Expectancy</b>	=	average modified life span of species - age of tree
<b>Life Expectancy</b>	=	average modified life span of species - age of tree		
<b>5</b>	Consider how health may affect safety (& longevity)			
<b>6</b>	Consider how tree structure may affect safety			
<b>7</b>	Consider how location will affect safety			
<b>8</b>	Determine safe life expectancy			
	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;"><b>Safe Life Expectancy</b></td> <td style="text-align: center;">=</td> <td style="text-align: center;">life expectancy modified by health, structure and location</td> </tr> </table>	<b>Safe Life Expectancy</b>	=	life expectancy modified by health, structure and location
<b>Safe Life Expectancy</b>	=	life expectancy modified by health, structure and location		
<b>9</b>	Consider economics of management (cost vs benefit of retention)			
<b>10</b>	Consider adverse impacts on better trees			
<b>11</b>	Consider sustaining amenity - making space for new trees			
<b>12</b>	Determine SULE			
	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;"><b>Safe Useful Life Expectancy</b></td> <td style="text-align: center;">=</td> <td style="text-align: center;">safe life expectancy modified by economics, effects on better trees and sustaining amenity</td> </tr> </table>	<b>Safe Useful Life Expectancy</b>	=	safe life expectancy modified by economics, effects on better trees and sustaining amenity
<b>Safe Useful Life Expectancy</b>	=	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

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## 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	<b>High Retention Value</b>						
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 2 below)

Tree protection is to be carried out on all trees to be retained on site.

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

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 2 Drawing taken from AS 4970-2009 below.

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 site Arborist and the words NO ENTRY.

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, unless approved and supervised by the project arborist.

### Example of tree protection fencing



Figure 2 Drawing taken from AS 4970-2009

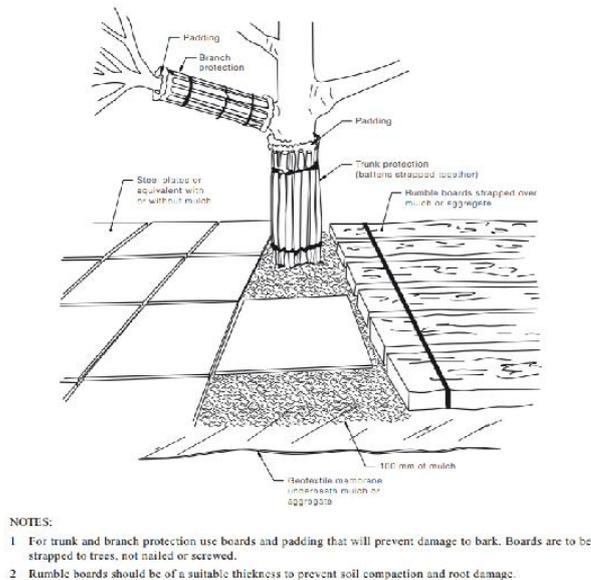


Figure 3 Trunk and branch Protection (AS 4970-2009)



Figure 4 Trunk Protection

## 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 3 and Figure 4 above.

## 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.

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## **10.1 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 Breast Height (DBH)<sup>(4)</sup>:** 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.

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**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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Industry Licence AL1286-1

### Professional Memberships

Member of Arboriculture Australia No. 1286 (Certified Practicing 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.

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*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 (BHort Sci (USYD), Dip Arb AQF 5 (TAFE), Grad Cert AQF 8 (UMELB), TRAQ