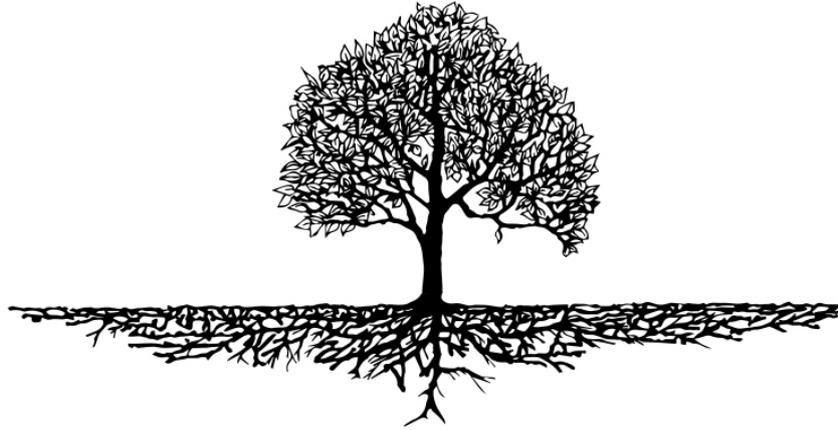


<b>Client</b>	Mr Austin Lee
<b>Location</b>	8 Bennet Avenue Strathfield South
<b>Document Type</b>	Arboricultural Risk Assessment & Assessment for Damage
<b>Date</b>	10 <sup>th</sup> December 2020.



# The Ents Tree Consultancy

Development Reports | Hazard Assessments | Tree Management

Hayden Coulter

AQF Level 8 Graduate Certificate in Arboriculture  
AQF Level 5 Diploma in Arboriculture  
AQF Level 4 Advanced Certificate in Urban Horticulture  
AQF Level 3 Greenkeeping Certificate



STRATHFIELD COUNCIL  
RECEIVED

DA2020.245  
6 January 2021



<b>Client</b>	Mr Austin Lee
<b>Location</b>	8 Bennet Avenue Strathfield South
<b>Document Type</b>	Arboricultural Risk Assessment & Assessment for Damage
<b>Date</b>	10 <sup>th</sup> December 2020.

## 1. Contents

2. Introduction	3
3. Methodology	3
4. Discussion	4
5. Recommendations	5
Appendices	
1. U.L.E Rating Schedule	5
2. Assessment of Trees	6
3. Tree Images	7
4. Site Plan	7
5. References	8
6. ISA Tree Risk Assessment	9
7. STARS Rating System	10
8. Glossary of Terms	12
9. Curriculum Vitae	14
	15



## 2. Introduction

2.1 On 8<sup>th</sup> December 2020 Mr Lee engaged The Ents Tree Consultancy to complete a tree report for the tree located to the rear of the property at 8 Avenue Strathfield South. The client stated that the tree has been nominated to be inspected as he is concerned about the poor condition of the tree and the fact that the tree is continuing to die off. Consultation with the client about the number and position of trees to be inspected in relation to the site occurred prior to a survey being completed.

2.2 The site inspection of the nominated tree occurred on 10<sup>th</sup> December 2020. The tree is located in a partially exposed position with some protection from surrounding trees, topography and surrounding structures. This tree appears to be average in size for its age which appears to be related to its growing conditions. The tree is growing in a lawn area close to the fence, shed and the rear of the house. The natural soil areas appear to have been disturbed previously for the construction of the houses and the surrounding hardscapes. The tree may have been present for the construction works on the adjoining site, potentially impacting of some of the roots. The client was present for the site inspection and issued a verbal brief providing background information in regard to the tree on site.

2.3 The purpose of this report is to assess the tree in relation to the site, noting the health and structural integrity at the time of the inspection. The growth potential of the tree, its characteristics and risk potential will be reviewed to estimate the trees landscape value and retention rating. The damage (if any) that the tree is doing in relation to the property will also be assessed. Tree Protection Guidelines will be discussed if relevant to this situation and options will be provided to resolve the issues concerning the tree if possible and requested by the client. The information in this report will be based on the information presented by the client at the time of the inspection as well as the site inspection. No root mapping was completed for the assessment of the tree. No specialised testing or aerial assessments were completed for the purpose of this report as it did not appear to be required to make a recommendation.

2.4 To achieve the objectives of the report, the tree will be assessed noting the species, size, general condition with any defects or damage to the trees discussed. The trees characteristics and eventual sizes will be taken into consideration as will the trees position in relation to structures and hard scapes. Recommendations will be outlined in section 5 of the report. Details of the tree surveyed will be provided in Appendix 2 of the report and a numerical system will be used to identify the tree for this report and future reference on this job site. A site plan will show the tree and its allocated number in Appendix 4. If no site plan has been provided by the client, an aerial image will be provided to indicate the position of the trees on site.

2.5 To assess the level of risk the tree poses to the surrounding houses and the land users TRAQ Tree Risk Assessment will be completed based on the tree at the time of the assessment and the areas use. The trees Risk Potential was recorded using the TRAQ methodology and criteria from the ISA Publication, Best management Practice, Tree Risk Assessment. Refer to Appendix 6 for the Likelihood Matrix under the risk categorisation section of the QTRA form. The trees landscape and retention value will also be assessed using the STARS system, refer to Appendix 7. This will assist in ascertaining the trees value in the landscape as well as their overall retention value. This methodology of tree assessment is consistent with the best practices of the industry and recognised industry standards. Please note that no aerial inspections, specialised testing or root mapping was completed for the purpose of the assessment.

## 3. Methodology

3.1 The trees were assessed using the standard Visual Tree Assessment technique (VTA). The trees were assessed from the ground for the purpose of this report. VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994).

3.2 A Lufkin 6.5m diameter tape was used to obtain the Diameter at breast height (DBH) as recommended at 1.4 metres unless otherwise stated due to variations in the trees form.

3.3 The height of the tree was estimated and the spread of the trees canopy was paced out.

3.4 A Canon 5D Digital camera with an 11-24mm and 24-105mm lens was used to take all photographs in this report. No image modification has been used in any of the images, although due to the wide-angle lens some distortion of images may occur.

3.5 The ULE rating system has been used as a guide to assist in determining the Useful Life Expectancy of the tree surveyed. Refer to Appendix 1.



## 4. Discussion

4.1 The tree nominated to be inspected is located to the rear of the client's property at 8 Bennett Avenue Strathfield South. The tree is considered significant in the immediate landscape but is not likely to be considered important in the local areas landscape in terms of amenity and function due to its small size and condition. The client is concerned about the trees health as the tree is continuing to decline from having a full crown to approximately 60% crown cover with large sections of dieback in the trees vascular tissue from below ground, up the trunk into all primary branches. The client is concerned about the appearance of the tree and the potential for the tree fail, injuring land users under the tree or damaging his house or the adjoining property.

4.2 The tree is located in a partially exposed position with some protection provided from the surrounding structures, trees and topography. The soil on the site appeared to be a sandy loam. This soil has been disturbed previously for earthworks, the construction of buildings and hardscapes. The tree was present for the construction and earthworks of the building next door. This may be one factor contributing to the trees decline. No root mapping occurred for the purpose of the report. No aerial assessments or specialised diagnostic testing was completed for the purpose of this report as it did not appear to be warranted to make a recommendation for this tree.

4.3 **Tree 1** is a mature tree that has below average health, below average vigour and below average form for this species. The tree has a high level of deadwood, a high level of dieback with a low level of epicormic growth and below average vitality at the time of the inspection. The tree has been lopped heavily to the east by the neighbour. The tree appears to have lost at least 40% of its crown and is attempting to regrow. The tree has lost its true form and is misshapen with deadwood throughout its structure. Another issue with the tree is that it has a series of large wounds from below ground, on the trunk and on all primary branches with decay developing in some sections.

4.4 The tree appears to have entered a mortality spiral. The tree may produce suckering and survive for the short term; however, the tree will not regrow a full viable crown. The form of the tree has been ruined and the tree will not produce sufficient canopy cover to sustain the trees biological requirements whilst attempting to cover the extensive wounding throughout its structure. The client has stated that he would like to remove and replace the tree with a more suitable specimen that does not present the issues of this tree. This appears to be the best management option for the site.

4.5 A tree risk assessment has been completed using the ISA, TRAQ Tree Risk Assessment methodology which is based on the Best Management Practice for Tree Risk Assessment. Part of the form has been included for transparency, refer to Appendix 6. Within the target zone of the tree there is the client's rear yard, rear shed as well as the clients house. The adjoining rear yard is also under the tree. The areas within the fall zone of the tree appeared to be of low use for most of the time and received moderate levels of use for limited times during the week. The areas are used intermittently by people, but the structures are always in the fall zone. The consequence of a tree part failing, will either be damage to the client's house / hardscapes or possible people. The pedestrian traffic is intermittent and the chances of hitting a person are unlikely with minor consequences.

4.6 Using the risk matrix as shown in appendix 6 the likelihood of failure within the next year is possible from the primary or secondary branches. A failure from the tree's trunk or the trees basal plate is also possible. In the event of a failure the likelihood of hitting a structure is somewhat likely, combined with the consequence of hitting a structure, (minor). This tree receives a rating of having a low of risk for damaging a buildings/hardscape based on the assessment criteria.

4.7 Using the risk matrix as shown in appendix 6 the likelihood of failure within the next year is possible from the primary or secondary branches. A failure from the tree's trunk or the trees basal plate is also possible. In the event of a failure the likelihood of hitting a person is unlikely, combined with the consequence of hitting a person, (minor). This tree receives a rating of having a low of risk for damaging a buildings/hardscape based on the assessment criteria.



## 5. Recommendations

5.1 The tree that was assessed is a mature tree with a low retention value. The tree appears to have been significantly impacted upon by the recent drought, possibly the previous building works on the adjoining property. The tree has lost an estimated 40% of its crown and is attempting to regrow. The past dieback has ruined the form of the tree. The tree has extensive wounding throughout its structure with decay and splits developing in the tree. The tree has entered a mortality spiral. The tree nominated to be assessed was assigned a risk potential that is deemed to be a low risk to people and a low risk to property. The tree may not be a high-risk specimen, however due to the trees poor condition, the tree is recommended for removal.

5.2 The client would like to remove the tree due to its poor health. If the tree is removed, the tree should be replaced the tree with a more suitable specimen. Suitable replacement tree can be planted to replace the canopy cover lost by the removal of the tree.

Please do not hesitate to call **0422 265 128** if you have any questions regarding the contents of this report.

Regards

Hayden Coulter  
AQF Level 8 Graduate Certificate in Arboriculture  
AQF Level 5 Diploma in Arboriculture  
AQF Level 4 Advanced Certificate in Urban Horticulture



### Disclaimer

All trees have been assessed based on the information and facts of the site and as presented by the client or relevant parties at the time of inspection. No responsibility can be taken for incorrect or misleading information provided by the client or other parties. The nominated tree/s are assessed for biological requirements and hazard potential with reasonable care. The trees are assessed from the ground and by visual means only unless otherwise stated. All tree protection and tree preservation measures are designed to minimise the damage to the tree/s or to reduce the hazard potential of the tree/s. Trees are inherently present risk, therefore will always have a hazard potential. Trees fail in ways that are not predictable or fully understood. There is no guarantee expressed or implied that failure or deficiencies may not arise of the subject trees in the future. No responsibility is accepted for damage to property or injury/death caused by the nominated tree/s.

## Appendix 1 ULE Rating

**Useful Life Expectancy (ULE):** Useful life expectancy refers to an expected period of time the tree can be retained within the landscape before its amenity value declines to a point where it may detract from the appearance of the landscape and/or becomes potentially hazardous to people and/or property. ULE values consider tree species, current age, health, structure and location. ULE values are based on the tree at the time of assessment and do not consider future changes to the tree's location and environment which may influence the ULE value.

Category rating:	Category definition in years:	Category rating:
1	> 40 Years	High
2	15 - 40 Years	Medium
3	5 - 15 Years	Low
4	0 - 5 Years	Dead



**Appendix 2 Tree Table**

Tree No	Species	Height (m)	DBH* & DAC**	Canopy Spread (m)	TPZ ***	Health #	Structure #	ULE Rating ****	Landscape Rating +	Stars Rating +	Risk Rating ##	Observations and comments
1	<i>Lagerstroemia indica</i>  Crepe Myrtle	9	.31, .25, .42 DAC .54	8	6 SRZ 2.6	Ba	Ba	3	L	L	Low (people) Low (Property)	<ul style="list-style-type: none"> <li>• A mature tree that has below average health, below average vigour and below average form for this species.</li> <li>• The tree has a high level of deadwood, a high level of dieback with a moderate level of epicormic growth and below average vitality at the time of the inspection.</li> <li>• The tree has been lopped in the past to the east of the tree for clearance by the neighbor.</li> <li>• The tree appears to have been present during previous building works with some of the tree protection zone impacted upon and well as areas within the trees projected structural root zone.</li> <li>• The tree has multiple areas of vascular tissue missing from below ground, on the trunk and all of the primary branches.</li> </ul>

**Explanatory Notes for Table**

- \*Dbh = Diameter of trunk at breast height.
- \*\* DAC = Diameter above the root collar used to measure the Structural Root Zone (SRZ).
- \*\*\*TPZ is the recommended TPZ 12x the DBH at 1.4m, SRZ is the trees structural root zone. Refer to AS4970 for details.
- \*\*\*\* ULE Explanation can be found in Appendix 1.
- + IACA Landscape value and S.T.A.R.S Rating system. Refer to Appendix 7
- ## TRAQ Risk Assessment, refer to appendix 6.
- # Health and Structure values represented above are P = poor, BA = Below Average, A = Average, G = Good



### Appendix 3 Images

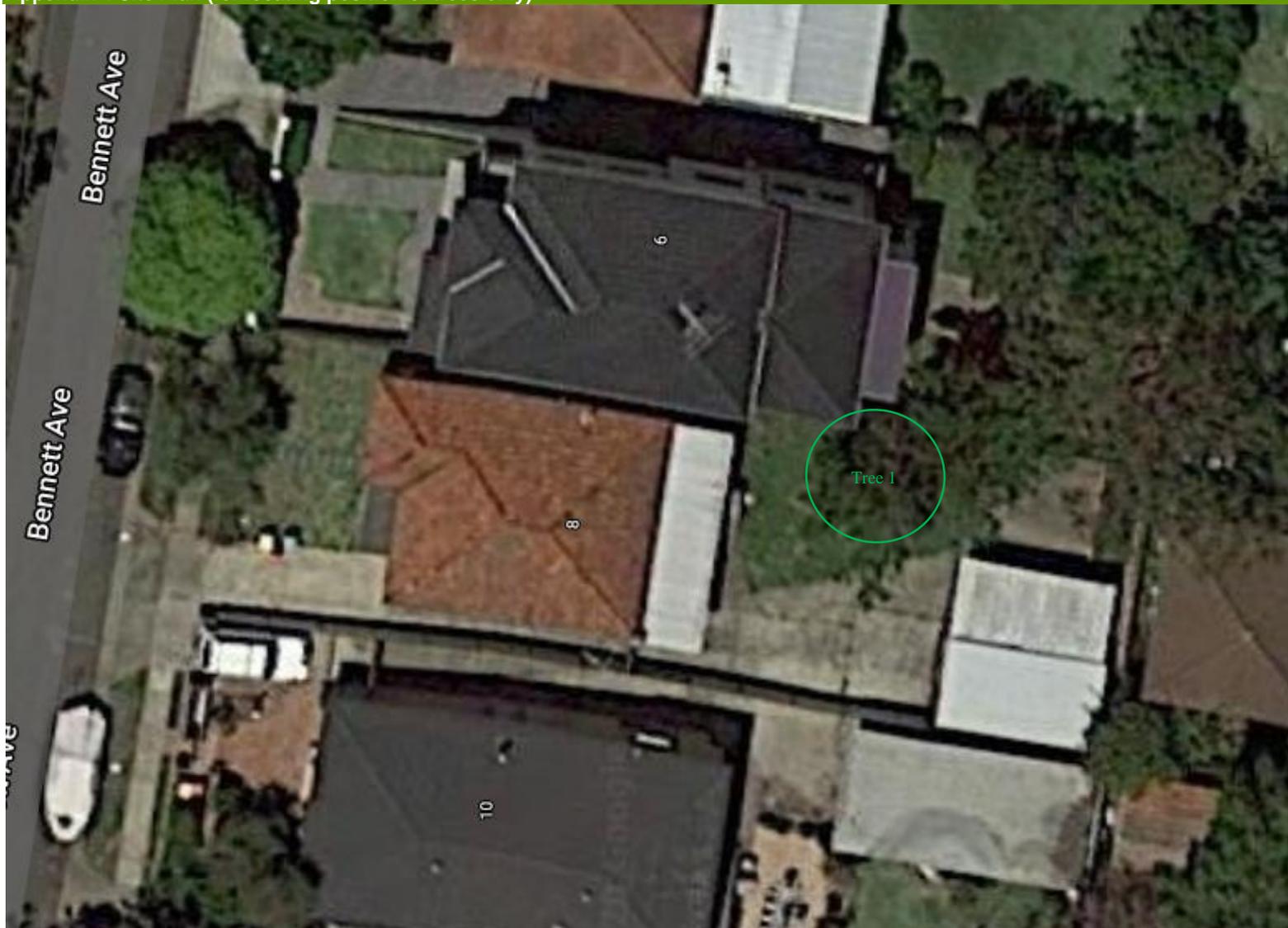


Image 1 above left shows the tree to the rear of the site. Image 2 above left centre shows the dieback in the crown of the tree with large sections dead. Image 3 above centre shows large sections of the vascular tissue missing. Image 4 above right centre shows the dieback in the base from below ground to the primary fork. Image 5 above right shows decay and vascular tissue missing in the primary branches. Images 6 & 7 below left and centre show the missing vascular tissue in the trees structure. Image 8 below right shows the lopped branches on the fence to the east of the tree.





Appendix 4 Site Plan (for locating position of trees only)





## Appendix 5 Tree References

Harris, R. W; Clark, J.R; & Matheny, N.P (2004). *Arboriculture: Integrated Management of Landscape Trees, Shrubs & Vines* 4<sup>th</sup> Edition, Prentice Hall, New Jersey

Shigo, A.L. (1986). *A New Tree Biology*. Shigo & Trees, Associates, Durham, New Hampshire

Hadlington, P. & Johnston, J. (1988). *Australian Trees: Their Care & Repair*. University of NSW Press, Kensington

Lonsdale, D. (1999). *Principles of Tree Hazard Assessment & Management*. Forestry Commission, The Stationery Office, London

Mattheck, C. & Breloer, H. (1994). *The Body Language of Trees*. Research for Amenity Trees No.4. The Stationery Office, London



## Appendix 6 Tree Risk Assessment

This Tree Risk Assessment has been based on the Best Management Practice for Tree Risk Assessment, E. T Smiley, Nelda Matheny, Sharon Lily, published by the ISA 2011.

The Tree Risk Categorization in this case is a qualitative risk assessment used by qualified tree assessors in combination with a matrix to assign risk. The assessor considers possible targets, the target zone, occupancy rates, site specific factors, Tree species, noted defects and environmental factors within a specified period.

The tree assessor uses this information to Categorize risk for the Likelihood of failure, combined with the Likelihood of impacting a target. These two categories make up the first table (table 1) in the Tree Risk Matrix. The second table assesses the Tree Risk rating by combing the Likelihood of failure and impact in table 1 with the Consequences of the branch or tree failing, refer to table 2. The end result is a risk rating of low, moderate, high or severe.

The Likelihood of failure options,

- **Improbable-** the tree or branch is not likely to fail in normal weather conditions within the specified time period.
- **Possible-** Failure of the tree or branch could occur in normal weather conditions within the specified time period.
- **Probable-** the tree or branch may be expected to fail in normal weather conditions within the specified time period.
- **Imminent-** the tree or branch failure has started and is likely to occur in the near future, even without significant wind or load. This is a rare occurrence for the risk assessor to encounter and immediate action must be taken to prevent harm to people or property.

The Likelihood of impacting a target options,

- **Very low-** The chance of the failed tree or branch hitting a target is remote. This would be the case in a site with no targets or a rarely used site or a site that is protected by from impact by other structures.
- **Low-** It is not likely that the failed tree or branch will impact the target. This would be the case in a site which is fully exposed to the tree but is used occasionally, a frequently used area that is partially exposed to the assessed tree.
- **Medium-** The failed tree or branch may or may not hit the target with nearly equal likelihood. This would be the case in a frequently used area that is fully exposed on one side to the assessed tree, or a constantly occupied area that is partially protected for the assessed tree.
- **High-** The failed tree or branch will most likely impact the target. This would be the case when a fixed target is fully exposed to the assessed tree or near a high use road or walkway with an adjacent street tree.

Table 1. The matrix used to estimate the likelihood of a tree failure impacting a specified target.

Likelihood of failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Categorizing Consequences of failure

- **Negligible-** consequences are those that involve low value property damage or disruption that can be replaced or repaired and does not involve personal injury.
- **Minor-** consequences are those that involve low – moderate property damage, disruptions in traffic or disruption in communications or minor personal injury.
- **Significant-** consequences that involve property damage of a moderate to high value, considerable disruption or personal injury.
- **Severe-** consequences that could involve serious personal injury or death, damage to high value property or disruption of important activities.



**Table 2. Risk rating matrix showing the level of risk as the combination of likelihood of a tree or part failing and impacting a target and severity of the associated consequences.**

Likelihood of failure and impact	Consequences			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

The four levels of risk as used in the table are defined below and should be used in making recommendations.

- Extreme-** The extreme risk category applies in situations in which failure is *imminent* and there is a high likelihood of impacting the target with severe consequences. The tree risk assessor should recommend mitigation measures to be taken as soon as possible. This may involve immediately restricting the target zone.
- High-** High risk situations are those for which consequences are *significant* and likelihood is *very likely* or *likely* or consequences are *severe* and likelihood is *likely*. This combination of likelihood and consequences indicates that the tree risk assessor should recommend mitigation measures. The decision for mitigation and timing of treatment depends upon the risk tolerance of the tree owner or risk manager.
- Moderate-** Moderate risk situations are those in which consequences are *minor* and likelihood is *very likely* or *likely* or likelihood is somewhat likely, and consequences are *significant* or *severe*. The tree risk assessor should recommend mitigation and or retaining the tree with monitoring. The decision for mitigation and timing depends upon the risk tolerance of the tree owner or manager.
- Low-** The low risk category applies when consequences are *negligible*, and likelihood is *unlikely* or consequences are *minor* and likelihood is *somewhat likely*. Some trees with this level of risk may benefit from mitigation or maintenance measures, but immediate action is not usually required. Tree risk assessors may recommend retaining and monitoring these trees as well as mitigation that does not include tree removal.



## Appendix 7 STARS Rating System

### IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

#### Tree Significance - Assessment Criteria



##### 1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

##### 2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

##### 3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

##### Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

##### Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

**The tree is to have a minimum of three (3) criteria in a category to be classified in that group.**

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.



Table 1.0 Tree Retention Value - Priority Matrix.

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
Legend for Matrix Assessment						
	<b>Priority for Retention (High)</b> - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.					
	<b>Consider for Retention (Medium)</b> - These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.					
	<b>Consider for Removal (Low)</b> - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.					
	<b>Priority for Removal</b> - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.					



**REFERENCES**

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, [www.icomos.org/australia](http://www.icomos.org/australia)

Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, [www.footprintgreen.com.au](http://www.footprintgreen.com.au)



## Appendix 8 Glossary of Terms

Abiotic	Nonliving
Anthraxnose	a fungal disease-causing dead areas on the leaves, buds, stems.
Arboriculture	The science and art of caring for trees, shrubs and other woody plants in landscape settings.
Barrier Zone	Protective boundary formed in new wood in response to wounding or other injury.
Biotic	Alive, pertaining to living organisms.
Branch attachment	The structural union of a lateral branch.
Callus	Undifferentiated tissue produced in response to wounding.
Canker	A dead spot or necrotic lesion that is caused by a bark inhabiting organism/pathogen.
Cavity	an open wound characterized by the presence of decay resulting in a hollow.
Collar	the ring of tissue that surrounds the lateral branch at its point of attachment.
Compartmentalization	A physiological process that creates the chemical and physical boundaries that act to limit the spread of disease and decay organisms.
Compression wood	A type of reaction wood that forms on the underside of branches which tends to maintain a branch angle of growth.
Crown	The above ground parts of the tree, including the trunk.
DBH	The diameter of a tree's trunk measured at 1.4m.
Decay	Process of degradation of woody tissues by fungi and bacteria through the decomposition of cellulose and lignin.
Decline	Progressive decrease in health of organs or the entire plant usually caused by a series of interacting factors.
Drip line	The width of the crown, as measured by the lateral extent of the foliage.
Epicormic shoot	a shoot that arises from latent or adventitious buds that occur on stems, branches or the bases of trees.
Included bark	Pattern of development at branch junctions where bark is turned inward, rather than pushed out; contrast with the branch bark ridge.
Mortality Spiral	The sequence of events describing a change in the trees health from vigorous to declining to death.
Photosynthesis	The transformation in the presence of chlorophyll and light, of carbon dioxide from (the air) and water (primarily from soil) into a simple carbohydrate and oxygen.
Pruning	systematic removal of branches of a plant usually a woody perennial.
Reaction wood	Specialized secondary xylem that develops in response to a lean or similar mechanical stress to restore the stem to vertical.
Taper	The change in diameter over the length of trunks and branches. Important to mechanical support.
Tension wood	A type of reaction wood that trees form on the upper side of branches and stems and roots.
VTA	Visual Tree Assessment is a method of evaluating structural defects and stability in trees.
Wound	Any injury that induces a compartmentalization response.



## Appendix 9 Curriculum Vitae

### Education and Qualifications

- Graduate Certificate Arboriculture University of Melbourne 2019 (AQF Level 8), 1<sup>st</sup> Class Honours.
- Arboriculture Australia 3 Day Tree Anatomy Workshop 2015
- QTRA basic certificate 2014, QTRA Advanced Certificate 2016
- TRAQ Qualification 2014
- 2005 Diploma of Arboriculture (AQF Cert 5), Ryde TAFE. Distinction Pass.
- Barrell Tree Care Workshop- Trees on Construction Sites (Brisbane 2005)
- Tree Logic seminar- Urban Tree Risk Management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar Sydney (2004)
- Excelsior Training Claus Mattheck (Sydney 2001)
- 2000 Tree Climbing Course (AQF Cert 2), Ryde TAFE.
- 1999 Advanced Certificate in Urban Horticulture, (AQF Cert 4), Ryde TAFE. Distinction Pass.
- 1995 Greenkeepers Trade Certificate (AQF 3) Ryde TAFE. Credit Pass.
- 1991 Higher School Certificate.

### Professional Membership Accreditation

- Institute of Australian Consulting Arborists ACM 0482014
- Arboriculture Australia Member number 2527

### Presentation of Scientific Papers

- Managing Mature Trees NAAA (Sydney 2000), Presented a Paper "Habitat Value of Mature Trees"

### Industry Experience

- **2004 to Date, Sole Trader, The Ents Tree Consultancy.** Writing of tree reports for development applications, master plans, hazard evaluations, tree management plans and expert witness reports. Hazard assessments, tree surveys and consultations. Clients include The Royal Botanic Gardens Sydney, UNSW Master Planning Works including SIRC building, Tyree Building, DP sports field redevelopment, Sydney University Mays Green Precinct, Taronga Zoo Coastline Precinct, Capital Insight, Campbelltown Hospital Redevelopment, Parramatta Park Trust multiple jobs, Woollahra Council multiple jobs and many other jobs.
- **2003 to 2008, Arborist University of New South Wales.** Survey all trees on site, developed a Tree Management Database. Minimise hazard potential of all trees on site through evaluation and works. Generate and prioritise works and tree assessment-based areas usage, tree conditions and staff required. Development of UNSW Tree Protection Guidelines for master planning works. Acting Supervisor December 2006 to May 2007.
- **2003 Tree management Officer Randwick Council.** Liaise with public to explain and enforce the councils Tree Preservation order. Management of internal staff and contractors. Project management and co-ordination of street tree planting and maintenance.
- **1999 to 2003 Animal Food Production Manager and Arborist.** Management of Koala Food Plantation, Management of animal food supply registry for herbivores/omnivores. Coordination of staff contractors and volunteers. Maintain and manage tree management database, complete tree works within zoo grounds and at zoo owned plantations. Acting supervisor 6-month period 2002 for grounds department and asset management trade team.