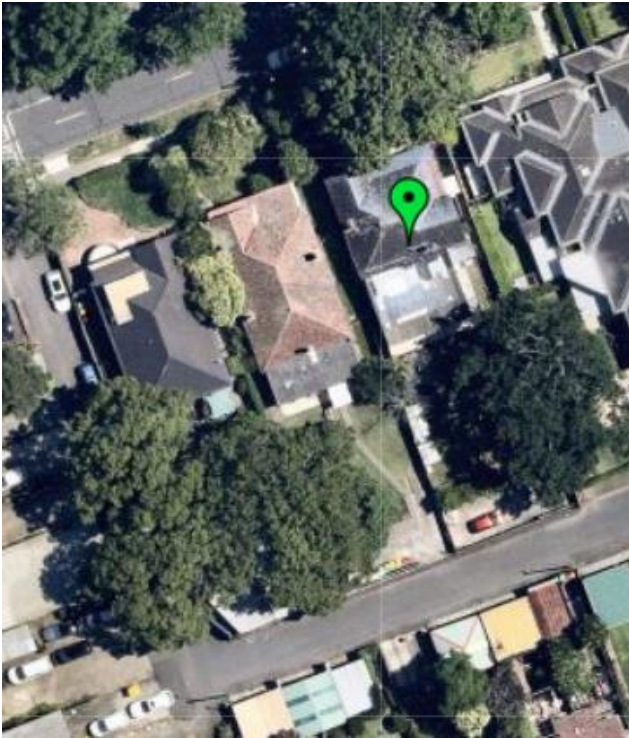




Preliminary Tree Assessment

92-96 Victoria Ave, Chatswood.

Prepared for: Networked Urban Solutions Pty. Ltd.

Prepared by:

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Date: December 21st, 2020.

Version-Final.

1 EXECUTIVE SUMMARY

Truth about trees have been engaged by Networked Urban Solutions Pty. Ltd. to provide a preliminary Tree Assessment in accordance with the requirements of AS4970-2009- The Protection of Trees on Development Sites.

This data is to be used to determine the value of the existing trees and will be used to accompany a planning proposal. Comments may be made in relation to future development; however, this report does not assess the impacts of development and a detailed Arboricultural Impact Assessment would be required at a later stage.

A site visit was conducted on Monday 14th December 2020.

Assessment was undertaken of all trees within the subject property and properties directly adjacent, which had the potential to be impacted upon by the proposed development.

The site is located within the municipality of Willoughby Council and as such, the trees were assessed in accordance with the Willoughby council DCP.

There are thirteen (13) trees within and surrounding the subject properties which meet the definition of a tree as defined within the Willoughby DCP.

One (1) tree is located within the adjacent property at 88 Victoria Avenue, the tree is a large mature English Oak tree (1) which is located adjacent to the boundary with 92 Victoria Ave. This tree has an extensive crown and potentially root system and may be a constraint to development.

Tree two (2) is a small Alexander Palm of low significance.

Trees 3, 4, 5, 6 & 12 are all mature *Cinnamomum camphora* (Camphor Laurel). This species is protected under Willoughby Council DCP unless they are under 10m in height. These trees are all greater than 10m so will be protected under the DCP. Of these trees one tree (Tree 12) is in poor health and may require removal in the short-term. Three of the trees (4, 5 & 6) are located hard against the property boundary with George Brain Lane and their location will make them unsuitable for long-term retention.

Tree seven (7) is a mature *Jacaranda mimosifolia* which has been planted in an unsuitable location where it will be unable to achieve mature dimensions.

Three (3) of the trees are council street trees (8, 11 & 13) located on Victoria Avenue, there is also an additional small dead tree located adjacent to tree #8.

Tree nine (9) is a semi-mature Kauri Pine with poor structure and an unsuitable location to achieve maturity.

Tree ten (10) is a semi- mature Kentia Palm of low significance.

2 CONTENTS

Table of Contents

1	EXECUTIVE SUMMARY	ii
2	CONTENTS	iii
3	INTRODUCTION	1
4	METHODOLOGY	2
5	TREE SCHEDULE	4
6	TREE LOCATIONS	5
7	CONCLUSIONS	6
8	APPENDIX 1: TREE ASSESSMENT METHODOLOGY	7
8.1.1	HEALTH AND VIGOUR ASSESSMENT	8
8.1.2	STRUCTURAL ASSESSMENT	8
9	SIGNIFICANCE OF A TREE, ASSESSMENT RATING SYSTEM (STARS)	10

3 INTRODUCTION

Truth about trees have been engaged by Networked Urban Solutions Pty. Ltd. to provide a preliminary Tree Assessment in accordance with the requirements of AS4970-2009- The Protection of Trees on Development Sites. The scope of this report is as follows:

- Assess all trees within the subject property and any adjacent property which have the potential to be impacted by the proposed development.
- Provide the following tree data: botanical name, common name, height, canopy spread, diameter, tree protection zones, structural root zones, landscape significance, estimated life expectancy, retention values.

This data is to be used to determine the value of the existing trees and will be used to accompany a planning proposal. Comments may be made in relation to future development; however, this report does not assess the impacts of development and a detailed Arboricultural Impact Assessment would be required at a later stage.

The site is at 92-96 Victoria Ave, Chatswood with the location shown in figure 1 below.



Figure 1- The subject site and approximate boundaries. Image taken from Near Maps 2020.¹

¹ Near Maps 2020- The location of the subject site. Near Maps

4 METHODOLOGY

A site visit was conducted on Monday 14th December 2020.

Assessment was undertaken of all trees within the subject property and properties directly adjacent, which had the potential to be impacted upon by the proposed development.

The site is located within the municipality of Willoughby Council and as such, the trees were assessed in accordance with the Willoughby council DCP, an excerpt of which is shown below.

A permit from Council is required to clear vegetation and prune or remove a tree if:

- The tree has the following dimensions:
 - a height exceeding 4 metres, or
 - a trunk girth (circumference) exceeding 600 millimetres measured at 1.4 metres above ground level, or
 - a crown spread exceeding 3 metres
- The tree is a locally indigenous species that is representative of the original vegetation of the area
- Any vegetation that is located within a defined wildlife corridor or has known wildlife habitat value
- The tree is visually prominent from the street or surrounding properties and makes a positive contribution to the visual character of the locality

Exemptions to requiring a permit are listed in [Part C.9 Vegetation Management of Willoughby Development Control Plan\(WDCP\)\(PDF, 408KB\)](#)

Undesirable species exempt from permit approval

Common Name	Botanical Name	Restrictions
Cootamundra Wattle	<i>Acacia baileyana</i>	
Golden Wattle	<i>Acacia siligna</i>	
Box Elder Maple	<i>Acer negundo</i>	
Tree of Heaven	<i>Ailanthus altissima</i>	
Evergreen Alder	<i>Alnus jorullensis</i>	
Nettle Berry	<i>Celtis spp.</i>	
Camphor Laurel	<i>Cinnamon camphora</i>	Only if less than 10m in height
Cotoneaster (all species)	<i>Cotoneaster spp.</i>	
Leighton Cypress	<i>Cupressocyparis, leylandii</i> "Leighton Green"	
Loquat tree	<i>Eriobotrya japonica</i>	
Coral Tree	<i>Erythrina spp.</i>	
Rubber tree	<i>Ficus elastia and cvs.</i>	
Honey Locust	<i>Gleditsia triacanthos</i>	
Silky Oak	<i>Grevillea robusta</i>	
Privet (all species)	<i>Ligustrum spp.</i>	
Liquidambar	<i>Liquidambar styraciflua</i>	
African Olive	<i>Olea europaea var. africana</i>	
Canary Island Date Palm	<i>Phoenix canariensis</i>	Only if trunk is less than 7m in height
Poplar (all species)	<i>Populus spp.</i>	
Willow (all species)	<i>Salix spp.</i>	
Cocos Palm	<i>Syagrus romanzoffianum</i>	
Robinia	<i>Robina pseudocacia</i>	
Frangipani	<i>Plumeria spp.</i>	
Narrow-leaved Black Peppermint/Willow Peppermint	<i>Eucalyptus nicholii</i>	
Pyramid Tree/Sally Wood/Itchy Bomb Tree/Cow Itch Tree	<i>Lagunaria petersonia</i>	
Oleander	<i>Nerium oleander</i>	
Chinese Tallow	<i>Triadica sebifera</i>	
Umbrella Tree	<i>Schefflera spp.</i>	
Evergreen Ash	<i>Fraxinus griffithii</i>	

Figure 2- Willoughby Council Tree Preservation controls.

Assessment of the trees was undertaken using the framework of the visual tree assessment procedure (VTA) as prescribed by Mattheck & Breloer 1994.² (See appendix 1) Tree Protection Zones and Structural Root Zones were calculated in accordance with AS4970-2009- The Protection of Trees on Development Sites³(see section 8.2). Tree Retention Values were determined using the IACA 'Significance of a Tree, Assessment Rating System'⁴(STARS - see Section 9).

- No internal diagnostic testing has been completed.
- No sub surface root testing or soil testing has been completed unless otherwise specified.
- All observations were made from the ground only.
- Tree heights, canopy spreads and diameters have been estimated.



Figure 3- An initial site survey has been completed with the trees located with a Trimble Geo-7x data logger as shown above. Medium retention trees are shown in orange, low retention trees are shown in yellowImage is a clipped KMZ file from Google Earth.⁵

² Mattheck & Breloer 1994- The Body Language of Trees.

³ Standards Australia- AS4970-2009- The Protection of Trees on Development Sites

⁴ IACA- Significance of a Tree Assessment Rating System- STARS

⁵ Google Earth- The location of the trees- Google Maps 2020.

5 TREE SCHEDULE

Table 1- Tree schedule

Tree no.	Botanical name	Common name	Height (m)	Spread(m)	Health & vigour	Structure	DBH (mm)	DAB (mm)	Tree Protection Zone (m)	Structural Root Zone (m)	Maturity	Landscape Significance	Estimated Life Expectancy	Retention value	Comments
1	<i>Quercus robur</i>	English Oak	15	25	Good	Fair	1200	1500	14.4	3.9	Mature	Medium	Medium	Medium	Located within neighbouring property.
2	<i>Archontophoenix alexandrae</i>	alexander palm	8	3	Fair	Good	N/A	N/A	1m outside crown projection	N/A	Mature	Low	Short	Low	
3	<i>Cinnamomum camphora</i>	Camphor Laurel	18	25	Good	Fair	1200	1500	14.4	3.9	Mature	Medium	Medium	Medium	
4	<i>Cinnamomum camphora</i>	Camphor Laurel	12	13	Fair	Fair	750	900	9.0	3.2	Mature	Medium	Short	Low	Unsuitable location to sustain further growth
5	<i>Cinnamomum camphora</i>	Camphor Laurel	12	8	Good	Fair	450	600	5.4	2.7	Mature	Medium	Short	Low	Unsuitable location to sustain further growth
6	<i>Cinnamomum camphora</i>	Camphor Laurel	13	13	Good	Fair	800	950	9.6	3.2	Mature	Medium	Short	Low	Unsuitable location to sustain further growth
7	<i>Jacaranda mimosifolia</i>	Jacaranda	8	10	Fair	Fair	360	450	4.3	2.4	Mature	Medium	Short	Low	Unsuitable location to sustain further growth
8	<i>Platanus x acerifolia</i>	London Plane Tree	3	2	Good	Fair	50	80	2.0	1.5	Juvenile	Low	Medium	Medium	Council street tree
9	<i>Agathis robusta</i>	Kauri Pine	11	3	Good	Poor	340	400	4.1	2.3	Semi-mature	Low	Short	Low	Unsuitable location to sustain further growth
10	<i>Howea forsteriana</i>	kentia	4	2	Fair	Good	N/A	N/A	1m outside crown projection	N/A	Semi-mature	Low	Medium	Medium	
11	<i>Liquidambar styraciflua</i>	Sweet Gum	20	20	Good	Fair	1100	1200	13.2	3.6	Mature	Medium	Medium	Medium	Council street tree
12	<i>Cinnamomum camphora</i>	Camphor Laurel	21	23	Poor	Poor	1250	1400	15.0	3.8	Senescent	Medium	Short	Low	
13	<i>Platanus x acerifolia</i>	London Plane Tree	15	12	Good	Good	400	500	4.8	2.5	Mature	Medium	Medium	Medium	Council street tree

6 TREE LOCATIONS



Figure 4- Tree locations with TPZs (Blue) and SRZs (Pink) overlaid with ArborCad.

7 CONCLUSIONS

There are thirteen (13) trees within and surrounding the subject properties which meet the definition of a tree as defined within the Willoughby DCP.

One (1) tree is located within the adjacent property at 88 Victoria Avenue, the tree is a large mature English Oak tree (1) which is located adjacent to the boundary with 92 Victoria Ave. This tree has an extensive crown and potentially root system and will be a constraint to development.

Tree two (2) is a small Alexander Palm of low significance.

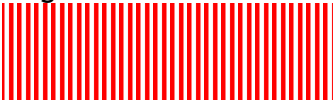
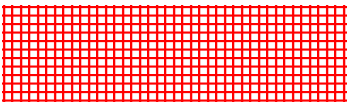
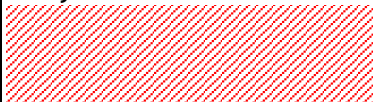
Trees 3, 4, 5, 6 & 12 are all mature *Cinnamomum camphora* (Camphor Laurel). This species is protected under Willoughby Council DCP unless they are under 10m in height. These trees are all greater than 10m so will be protected under the DCP. Of these trees one tree (Tree 12) is in poor health and may require removal in the short-term. Three of the trees (4, 5 & 6) are located hard against the property boundary with George Brain Lane and their location will make them unsuitable for long-term retention.

Tree seven (7) is a mature Jacaranda mimosifolia which has been planted in an unsuitable location where it will be unable to achieve mature dimensions.

Three (3) of the trees are council street trees (8, 11 & 13) located on Victoria Avenue, there is also an additional small dead tree located adjacent to tree #8.

Tree nine (9) is a semi-mature Kauri Pine with poor structure and an unsuitable location to achieve maturity.

Tree ten (10) is a semi- mature Kentia Palm of low significance.

High Retention Value	Medium Retention Value	Low Retention Value	Very Low Retention Value
			
N/A	1-3-8-10-11-13	2-4-5-6-7-9-12	N/A



8 APPENDIX 1: TREE ASSESSMENT METHODOLOGY

8.1 VISUAL TREE ASSESSMENT (VTA)

The VTA system is based on the theory of tree biology and physiology, as well as tree architecture and structure. This method is used by arborists to identify visible signs on trees that indicate good health, or potential problems. Symptoms of decay, growth patterns and defects are identified and assessed as to their potential to cause whole-tree, part-tree and/or branch failure. This system (represented by the image below) is based around methods discussed in 'The Body Language of Trees'¹⁰.

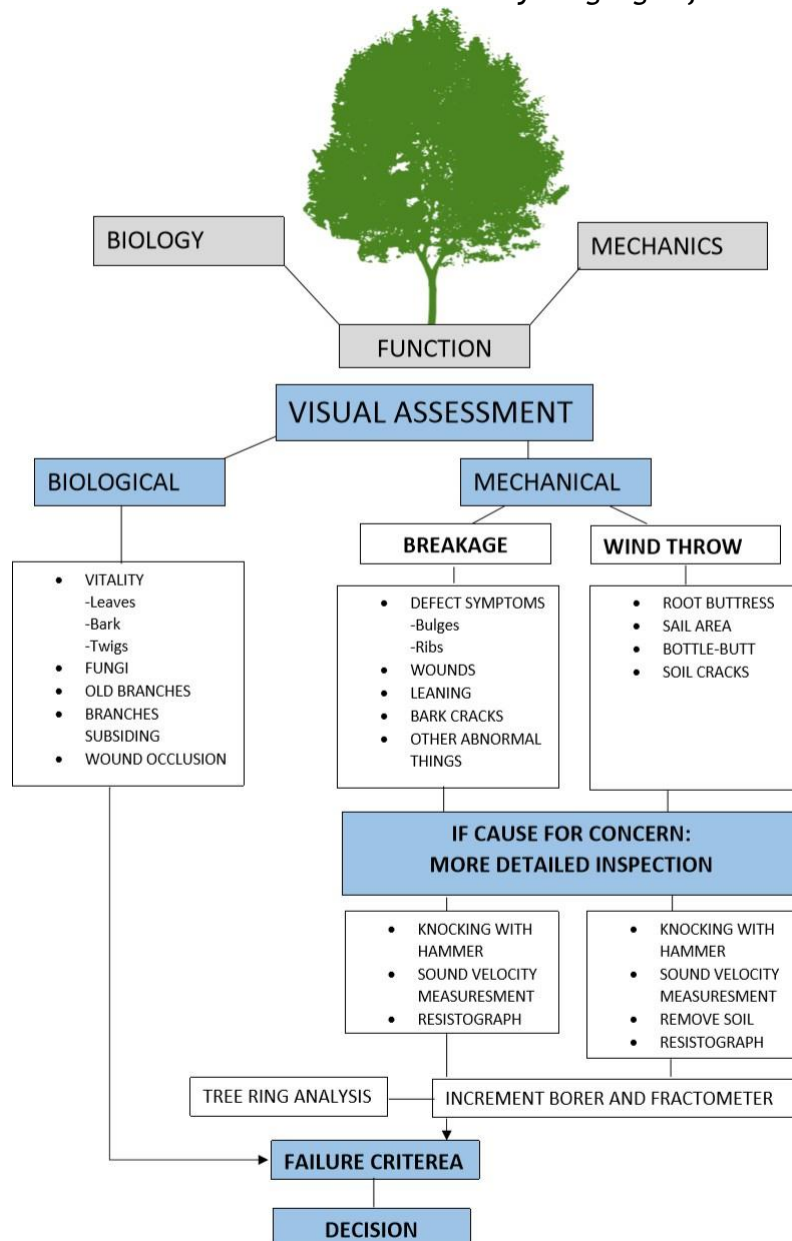


Figure 4- The Visual Tree Assessment Procedure.

For the purpose of this report, elements of the VTA system will be used, along with industry standard literature, and other relevant studies that provide an insight into potential hazards in trees. This assessment is a snapshot of what could be reasonably seen or determined from a basic visual inspection. The VTA system is generally used as a means to identify hazardous trees; however it is important to realize that for a tree to be hazardous there must be a target; a hazard poses no risk if there is no exposure to the hazard.

⁹ Mattheck, C. & Breloer, H. 1994. *The Body Language of Trees*.

8.1.1 HEALTH AND VIGOUR ASSESSMENT

The health and vigour of a tree are assessed by looking at the tree canopy and how it is performing. Certain indicators provide information on which to base the assessment. Abnormally small leaves, chlorosis (yellowing), sparse crown, wilting, and die-back can be signs of ill-health or decline but may also be related to a temporary imbalance due to drought or pest infestations. Epicormic growth can be a sign of stress and low energy reserves but can also be related to increased light levels through the removal or pruning of adjacent trees. Extension growth can be a good indicator of vigour, but this can vary greatly between species and under differing climatic conditions. For these reasons, each individual symptom or observation needs to be assessed with objectivity and consideration of all available information.

8.1.2 STRUCTURAL ASSESSMENT

The structural assessment of trees is carried out using the basic framework of Visual Tree Assessment. Signs and symptoms of defects are assessed to gauge the likelihood of failure, because not every defect constitutes a hazard e.g. *“...co-dominant stems are a structural defect. The severity of the defect is increased by included bark, large crowns and strong wind.”*¹¹ If trees were removed purely on the basis that there were defects present without assessing the likelihood of failure or whether practical mitigation measures are available, the urban forest would cease to exist. A basic visual tree assessment is undertaken from ground level, if defects are suspected further investigation may be required and recommended. *“[When using] the Visual Tree Assessment (VTA) procedure for assessing trees, as the suspicion increases that defects are present, the examination becomes more thorough and searching.”*¹

*“Some defects, especially some forms of decay, do not give rise to external signs and therefore tend to escape detection in a purely visual survey. If there is no reason for suspecting a hidden defect to occur within a particular part of the tree, there is no reasonable basis for carrying out a detailed internal assessment. Although in theory an unsuspected defect might be detectable by the use of specialized diagnostic devices, this would be impracticable in the absence of some external sign to indicate the place which should be probed. Also, internal examination without good reason is undesirable, as it usually causes injury to the tree and is unreasonably time consuming and costly.”*¹²

⁹ Matheny, N. & Clark, J. 1994. *A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas*.
¹⁰ Lonsdale. 1999. *Principles of Tree Hazard Assessment and Management*.



8.2 TREE PROTECTION ZONE (TPZ) & STRUCTURAL ROOT ZONE (SRZ) CALCULATIONS

In accordance with Australian Standard *AS4970-2009 Protection of trees on development sites*¹³, Tree Protection Zone (TPZ) radius is calculated using the following procedure. Diameter of the trunk is measured at approximately 1.4m above ground level; this measurement is referred to as DBH (Diameter at Breast Height). $R_{TPZ} = DBH \times 12$. For multi-stemmed trees the formula used is $R_{TPZ} = \sqrt{[(DBH1)^2 + (DBH2)^2 + (DBH3)^2]}$. The TPZ is measured radially from the centre of the stem and must be protected on all sides.

The Structural Root Zone (SRZ) radius is calculated by measuring the diameter of the stem close to ground level, just above the basal flare. This measurement is taken as D and then used in the following formula: $R_{SRZ} = (D \times 50)^{0.42} \times 0.64$ and becomes the Structural Root Zone, measured radially from the centre of the stem.

It is important to realize that these calculations provide a notional figure only and tree dynamics, form and site conditions will greatly affect these zones, and it is the job of the arborist to interpret the information correctly.

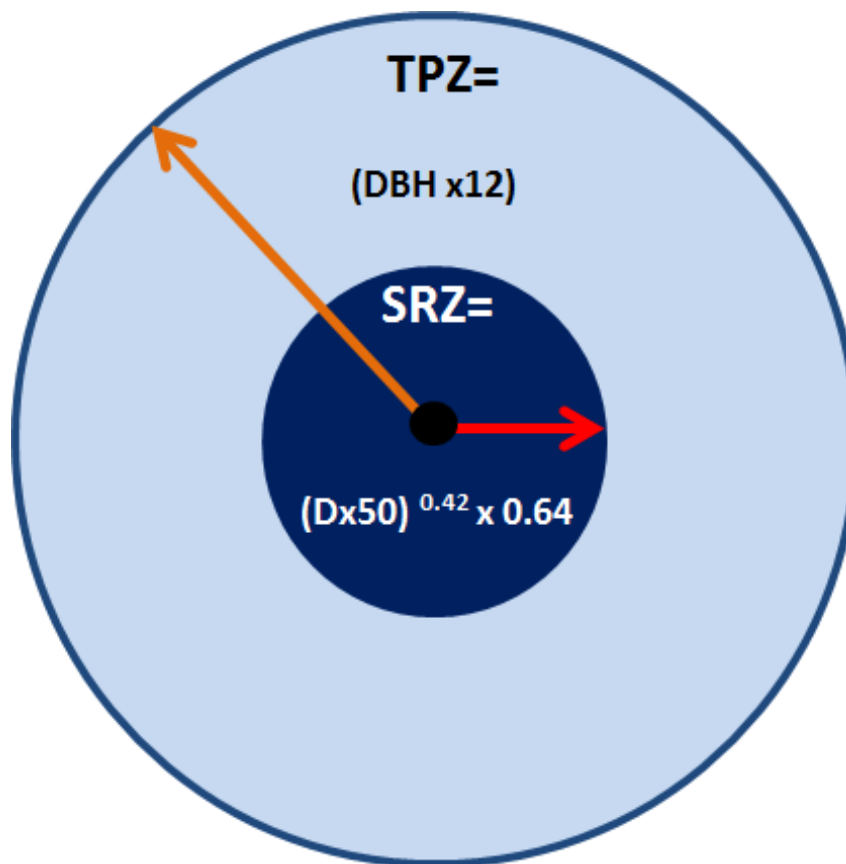


Figure 2 - A representation of TPZ & SRZ calculations.

For palms, cycads, tree ferns, and similar monocots, the TPZ is positioned at least 1m outside the crown projection. SRZs are not applicable to these plant types.

*AS4970-2009*³ states “a TPZ should not be less than 2m nor greater than 15m (except where crown protection is required)” and the minimum radius for an SRZ is 1.5m.

Standards Australia. 2009. *AS4970-2009 Protection of trees on development sites*.

9 SIGNIFICANCE OF A TREE, ASSESSMENT RATING SYSTEM (STARS)

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. An example of its use in an Arboricultural report is shown as Appendix A.

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.

IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au



		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



	Priority for Retention (High) - 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.
	Consider for Retention (Medium) - 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.
	Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

USE OF THIS DOCUMENT AND REFERENCING

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

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

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

IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

