

ARBORICULTURAL IMPACT ASSESSMENT (AIA) REPORT

Prepared For:	Mrs Jennifer Hempton
Site Address:	89 Marine Parade Avalon
Inspection Dates:	13 March 2023
Report Revision Date	8 November 2023

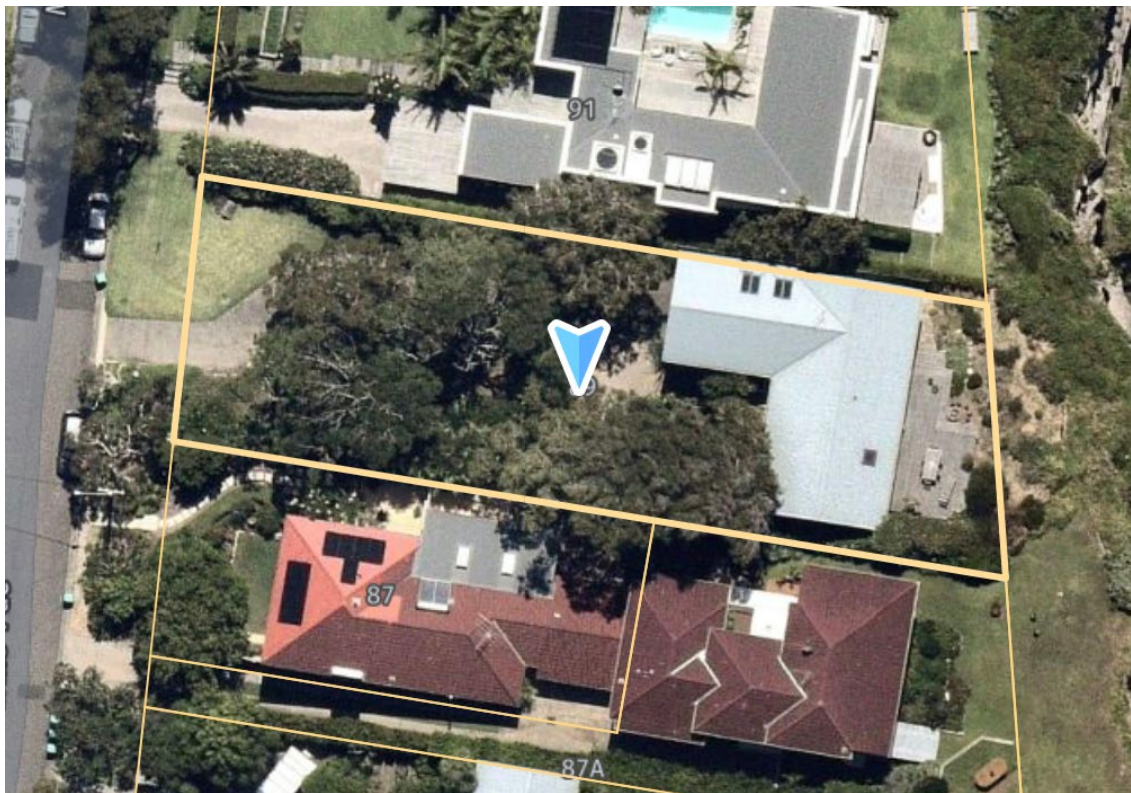


Image 1: The property Courtesy Nearmap accessed 28/03/2023.

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1 Executive Summary

- 1.1.1 Margot Blues Consulting Arborist has been engaged by the owner to inspect and report on trees for development application purposes. A new dwelling is proposed.
- 1.1.2 The report's aim was to determine tree health and condition; retention values and construction impact via methodologies VTA¹, STARS² & AS4970-2009.
- 1.1.3 Twelve mature trees have been reviewed. With the exception of T10 *Casuarina sp* (poor condition), trees generally were in fair to good health and condition. All twelve trees are impacted by the proposal.
- 1.1.4 In reviewing the supplied architectural plans and AS4970-2009 guidelines, the following recommendations have been determined:-

Under the proposal, no tree is retainable due to development impact.

Trees for removal

High Retention	Moderate Retention	Low Retention	Exempt
T12	T2, T3, T4, T5, T6, T7, T9 & T11	T10,	T1 & T8

Table 1: Trees not retainable.

¹ VTA – Visual Tree Assessment – Mattheck and Breloer 1994

² STARS – Significance of a Tree Assessment Rating System – IACA 2010



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2 Introduction

2.1 Background

- 2.1.1 Margot Blues Consulting Arborist has been engaged by the owner to inspect and report on trees within close proximity to the proposed development – A new multi storey dwelling will replace the existing dwelling.
- 2.1.2 The report's aim was to:
- Conduct a visual assessment of protected trees.
 - Categorise the trees into retention priority (High/Medium/Low).
 - Determine the construction impact to trees based on AS4970-2009 guidelines and supplied plans for retention/removal purposes.
- 2.1.3 Information supplied and relied upon in the preparation of this report included:
1. Architectural suite of drawings by Annabelle Chapman Architect dated 27/10/2023 – DA Stage.
 2. Survey dated 25/10/2023 Issue 2 by C.M.S Surveyors Pty Ltd.
 3. Landscape Plan by Contour Landscape Architecture dated 25/10/2023 Revision B.

The use of this information is acknowledged.

2.2 Desktop Research

- 2.2.1 The NSW Planning portal:
- Zoning: C4 – Environmental Living (Pittwater Local Environmental Plan 2014).
- 2.2.2 In accordance with Council guidelines: A prescribed tree, is any tree
- Five (5) metres or greater in height; not listed on the exempt species list or *Biosecurity Act 2015*.

2.3 Definition

- 2.3.1 AS4970:2009 – An abbreviation for Australian Standard 4970:2009 - *Protection of Trees on Development sites*.
- A Minor Encroachment is defined as encroachments less than 10% of the TPZ³ area and outside the SRZ⁴.
 - A Major Encroachment is defined where encroachment more than 10% of the TPZ or inside the SRZ occurs. The project arborist must demonstrate that the tree would remain viable given the level of incursion.

³ TPZ – Tree Protection Zone

⁴ SRZ – Structural Root Zone



3 Methodology

- 3.1.1 Trees were inspected in accordance with industry standards utilising methodologies derived from the Visual Tree Assessment (VTA) by Mattheck and Breloer (1994) focusing on the trees' biological and mechanical characteristics and Tree Risk Assessment (TRAQ) - Level 2 assessment:
- Biological assessment included leaves (volume and colour); the presence of pests and diseases, canopy dieback, deadwood and epicormic growth.
 - Tree mechanics included assessment of structural stability, previous pruning and any damage/disturbance which may have occurred.
 - A Level 2, Risk and Hazard Assessment based on TRAQ (Tree Risk Assessment) methodology included i.e. Evaluation of risk its likelihood, severity and consequences and tree management strategies.
- 3.1.2 No destructive or aerial investigations occurred to any tree.
- 3.1.3 Tree heights and canopy widths were estimated – See Appendix 1 – Tree Data.
- 3.1.4 Appendix 2 –Tree location and construction impact. The tree protection zones (TPZ) are represented by the outer circle and the structural root zone (SRZ) inner magenta circle (plotted where required). Both TPZ and SRZ have been calculated in accordance with AS4970-2009.
- 3.1.5 Under Section 3.2 of the AS 4970-2009 *Protection of Trees on Development Sites*. The maximum TPZ area is 15 metres and applicable to T12. The tree has a DBH⁵ of 1.3 metres.
- 3.1.6 Appendix 3 – Photographs
- 3.1.7 Appendix 4 – STARS –Significance Tree Assessment Rating methodology (IACA).
- 3.1.8 This report is considered limited to what could reasonably be seen from ground level and expresses no commentary on changes which may have, or will, impact the trees or their environment outside the scope of works.

⁵ DBH – (Diameter at Breast Height) -Trunk diameter measured at 1.4 metres above ground level.



4 Results

4.1 The Site

The property was located along the coastal limits (cliff face) and contained a single dwelling, two levels high. The land rose upwards west to east and contained a number of mature, native trees in the front garden (street side of the dwelling).

The paperbark trees planted close to the southern boundary appeared to have reduced canopies extending across properties 87 and 87A Marine Parade resulting in a bias canopy development to the north. See Image 1.

4.2 The Proposal

The new dwelling has a larger envelop than the existing and will consist of three levels (lower ground floor (garage), ground floor and first floor). The driveway is to be repositioned towards the southern half of the property.

The lower ground floor, including driveway and ground floors will require excavation.



4.3 Construction Impact to Trees

The following table summarises incursion conflict.

Tree No	Species	Impact	Retain/ Remove
T1 – T7	<i>Melaleuca quinquenervia</i> Broad leaf paperbark	Construction Impact: High in accordance with AS4970-2009	REMOVE all seven (7) trees.

All 7 trees fall within the excavation or just outside the proposed retaining wall along the southern boundary.

Tree T1 is within 2 metres from the existing dwelling – therefore exempt.

Remaining 6 trees were assessed as having a “moderate” retention value.

With the exception of T5 and T7 the remaining five trees had a bias canopy to the north which will be in conflict with the building. Extensive canopy removal had occurred above property 87 Marine Pde Avalon Beach.

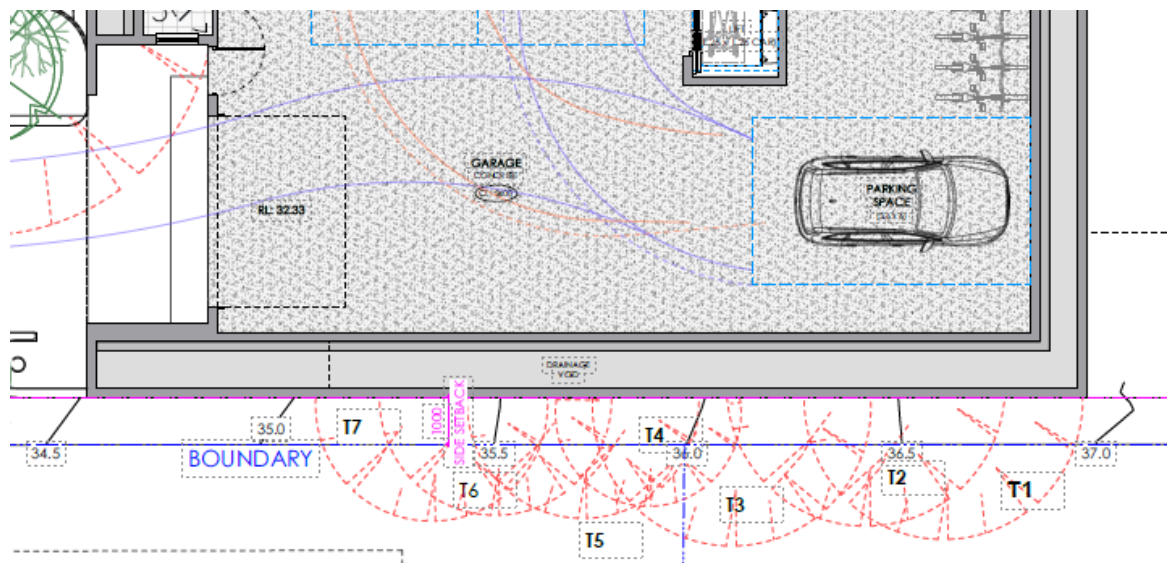
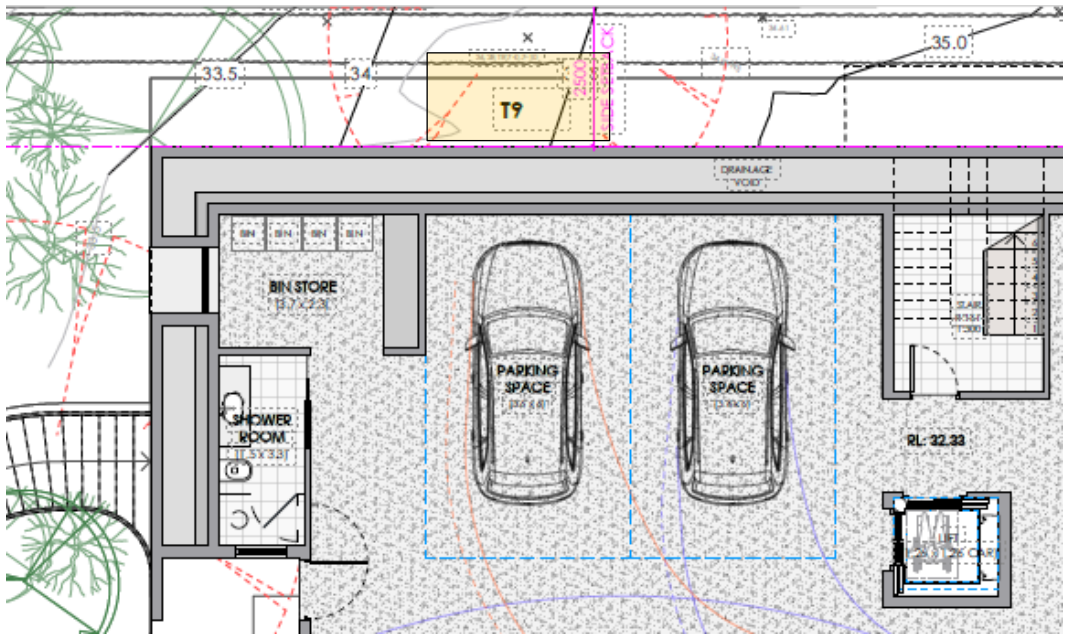
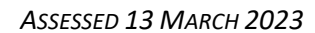


Figure 1 7 x Broad Leaf Paperbarks located on the southern boundary

Trees are not retainable based on the proposal.



T8	<i>Dracaena spp</i>	Construction impact: High	Remove
Tree is less than 5 metres in height therefore exempt. The tree falls within the footprint of the new dwelling. Tree is not retainable and should not pose a constraint upon the development.			
T9	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	Construction Impact: High The proposed dwelling extends closer to the street and will require the removal of almost half the tree's canopy plus	Retention value High Remove
The proposed building is within 2 metres of trunk centre. (SRZ 3.2m radial. TPZ 4.8 metres radial). Base of tree RL 34.28 (Survey) and finished garage floor FFL 32.22 (Architectural). Approximate minimum excavation depth not including sub slab preparation 2 metres and within both SRZ and TPZ. Excessive pruning of canopy also required to accommodate the building.			
			
Figure 2: Screenshot Proposed Basement Plan and impact to T9.			
Recommended removal due to an unacceptable development impact.			



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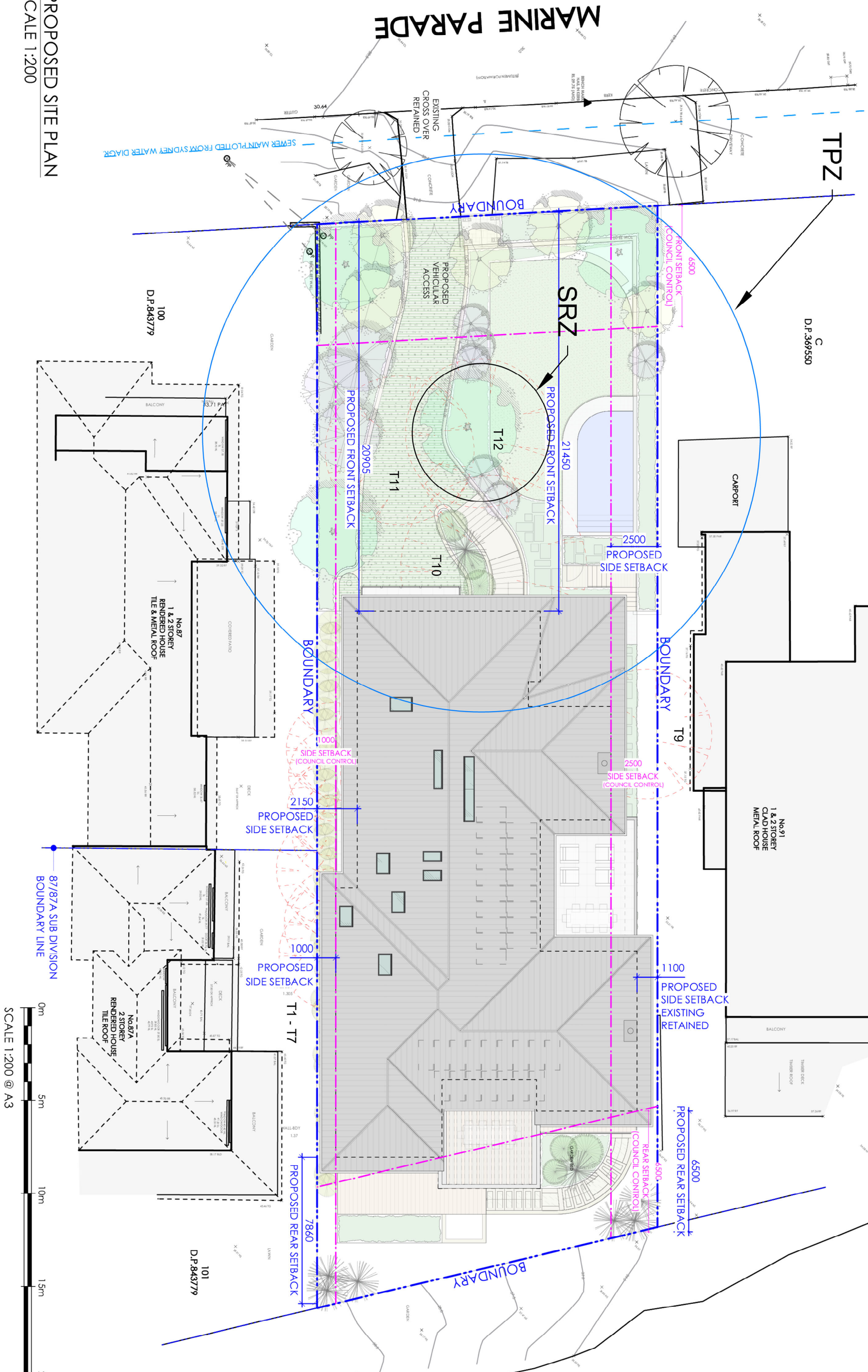
Table 3: Impact to trees

5 Conclusion

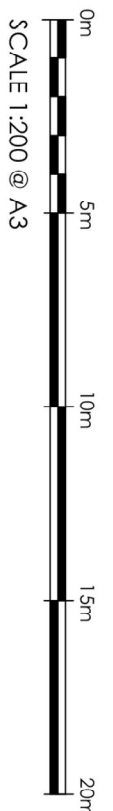
5.1.1 Based on the proposal the design necessitates the removal of twelve (12) mature native trees, these being:-

- T1 *Melaleuca quinquenervia* – Tree is exempt as it is less than 2 metres from the existing dwelling. Construction impact is high and retention not possible.
- T2 – T7 *Melaleuca quinquenervia* – Construction impact both below and above ground significant. These seven (7) trees are not retainable.
- T8 *Dracaena* – Exempt – tree falls within the envelope of the dwelling. Tree is not retainable. At the time of inspection this tree had not attained a height of 5 metres.
- T9 *Melaleuca quinquenervia* – Tree is unretainable based on the development impact. Excavation is to occur within the tree's SRZ and the canopy heavily impacted. The building falls within 2 meters of the tree.
- T10 – *Casuarina cunninghamiana* – Tree is unretainable as the trunk falls within the footprint of the garage. This tree appeared to be approaching over maturity.
- T11 – *Casuarina cunninghamiana* – A recommendation of removal has been reached given the known degree of building incursion into the tree's TPZ. It is assumed trenching within the trees TPZ/SRZ will occur along the southern side boundary for inground service requirements.
- T12 *Melaleuca quinquenervia* – Tree unretainable based on the development impact. The tree has a DBH of 1.3 metres with proposed excavation for driveway, retaining walls and pool within both the SRZ and TPZ of the tree. This level of impact renders the retention of this tree not optional.

Appendix 1: Tree Data Summary - 89 Marine Parade, Avalon - Assessed 13/03/2023																		
Tree ID	Species	Height (m)	Canopy dims n/s in metres	DBH (cm)	DGL (cm)	Foliage condition	Maturity	Trunk type	Trunk lean	Canopy Balanced	Past Pruning	Stability	Vigour	Canopy deadwood	Significance value	Notes - at the time of inspection	TPZ (M) Radius	SRZ (M) Radius
T1	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	9	9N 3S	72	100	Good	Mature	Multi-stemmed x 3	Upright	Majority to north	Southern half of canopy	Appears stable	Good	<5%	Low	A mature tree which forms the eastern most tree of a group of 7 paperbark trees. The trunk to house distance is 1.4m. Canopy heavily pruning to approximate boundary line (south). Otherwise no further comment required.	8.6	3.3
T2	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	10	8N 2S	45	150	Good	Mature	Multi-stemmed x 2	Upright	Majority to north	Southern half of canopy	Appears stable	Good	<5%	Moderate	Tree west of T1 and exhibits significant pruning event for the southern canopy.	5.4	3.9
T3	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	10	8N 2S	56	100	Good	Mature	Single to 0.6m then x 2	Upright	Majority to north	Southern half of canopy	Appears stable	Good	<5%	Moderate	Tree west of T2 and exhibits significant pruning event for the southern canopy.	6.7	3.3
T4	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	9	1N 5S	40	50	Good	Mature	Single	Upright	Majority to south	Southern half of canopy	Appears stable	Good	<5%	Moderate	Good health and condition despite somewhat limited natural space for canopy spread.	4.8	2.5
T5	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	9	10	45	60	Good	Mature	Single	Upright	Majority to north/South	NIL seen	Appears stable	Good	<5%	Moderate	Canopy bias elliptical N/S. Very limited ability for canopy spread E/W. Otherwise good.	5.4	2.7
T6	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	9	6N 3S 1W	50	60	Good	Mature	Single to 1.1m then x2	Upright	Majority to N/SW	Southern half of canopy	Appears stable	Good	<5%	Moderate	Good health and condition	6.0	2.7
T7	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	8	8	40	45	Good	Mature	x 2	Bias to north/NW	Bias to N/W	Lopped	Appears stable	Good	<5%	Moderate	Tree historically lopped. The majority of canopy is low and orientates to the west and north.	4.8	2.4
T8	<i>Dracaena spp</i>	<4	4	20	40	Good	Mature	Bias to north	Bias to north	Bias to N	lopped historically	Appears stable	Good	<5%	Low	Exempt species. A small tree in good health and condition.	2.4	2.3
T9	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	7	10	40	90	Good	Mature	Single to 1.3 then x 2	Upright	Balanced	Lower limbs to 2.5m	Appears stable	Good	<5%	Moderate	Tree mature and in appeared in excellent health and condition. Tree planted lower than existing driveway. Canopy extended above neighbouring 91 Marine Parade. Otherwise no additional comments required.	4.8	3.2
T10	<i>Casuarina cunninghamiana</i>	9	9N 2S	50	90	Fair/poor	Mature ? (over mature)	Single	Upright	Majority to north	Nil seen	Appears stable	Fair/poor	30%	Low	Canopy south displaying significant dieback. Much of this deadwood is in the process of falling as evidenced by large dead limbs on the ground. The bulk of canopy extends to the north. A vertical crack in one large limb (east) of trunk seen.	6.0	3.2
T11	<i>Casuarina cunninghamiana</i>	9	13	55	80	Fair/good	Mature	Single	Upright	Balanced	lower limbs to 3m	Appears stable	Fair/good	5%	Moderate	Lower trunk has been crown cleared. Canopy in two tiers (upper and lower) which is atypical for the species.	6.6	3.0
T12	<i>Melaleuca quinquenervia</i> Broad Leaf Paperbark	8	8N 2S	130	130	Good	Mature	Single	Upright	Maj to N/NE	Nil seen	Appears stable	Good	5%	High	Failed branch suspended within canopy. Branch appears to be from T10 - adjacent tree. Otherwise no problems seen.	15.6	3.7
	Exempt (>6m in height or trunk circumference <300mm or exempt listed) and only applies to trees within the property.																	
	^ Denotes tree located outside property boundary		DBH - Diameter at Breast height 1.4m above ground		DGL - Stem diameter measured above root flare.				Significance Value High Moderate Low									



1 PROPOSED SITE PLAN
SCALE 1:200



Margot Blues Consulting Arborist
Title: TREE ID
Project: APP 2 89 Marine Pde Avalon Beach
Date Plotted: 02/11/2023

Key:
Tree Protection Zone (TPZ)
TPZ Encroachment
Tree for Removal
Structural Root Zone (SRZ)
High Retention Value



Appendix 3 – Photographs



Photo 1: Trees 1 - 7 Mid to RHS of image - All large leaf paperbarks. Canopy pruning has occurred along southern side. T8 Dracaena LHS next to dwelling.



Photo 2: T9 Melaleuca extensive canopy removal due to proximity and height of dwelling.



Photo 3: T10 Casuarina sp. Poor form possibly entering the overmature phase.



Photo 4: T10 Extent of canopy dieback.



Photo 5: T11 Casuarina. Two tiered canopy.



Photo 6: T12 Melaleuca- mid image.

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.

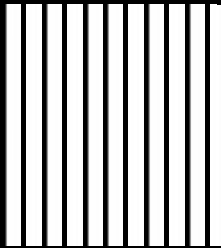
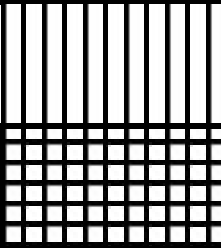
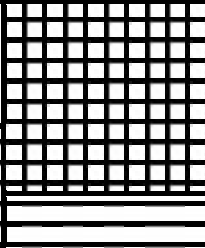
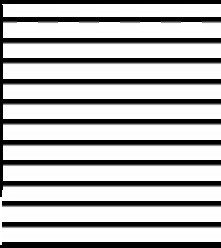
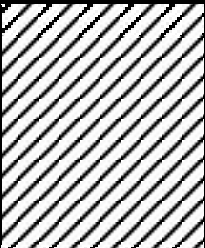
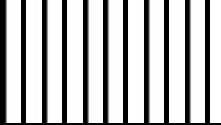
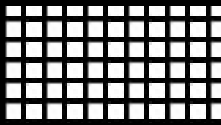
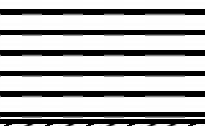
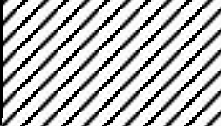
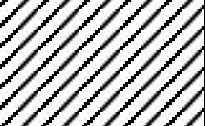
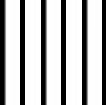
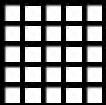
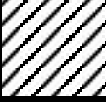
Hazardous/Irreversible Decline

- 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.

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 						
	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

Appendix A

The following example shows the IACA **Significance** of a **Tree, Assessment Rating System** (STARS) used in an Arboricultural report.

Tree Significance

Determined by using the Tree Significance - Assessment Criteria of the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010), Appendix B.

Trees 14, 16, 17/3, 19 and 20/4 are of high significance with the remaining majority of medium significance and a few of low significance. Tree 14 is significant as a prominent specimen and a food source for indigenous avian fauna. Tree 16 as a non-locally indigenous planting is of good form and prominent *in situ*; Tree 17/3 as a stand of 6 street trees along the Davey Street frontage screening views to and from the site and contiguous with trees in Victoria Park extending the aesthetic influence of the urban canopy to the site. Similarly for Trees 20/4 as street trees in Long Road and Tree 19 as an extant exotic planting as a senescent component of the original landscaping. The trees of low significance are recent plantings as fruit trees – Avocados, and 1 Cootamundra Wattle as a non-locally indigenous tree in irreversible decline and potentially structurally unsound.

Significance Scale

- 1 – High
2 – Medium
3 – Low

Significance Scale	1	2	3
Tree No. / Stand No.	14, 16, 17/3, 19, 20/4	1/1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12/2, 15, 18, 21/5	3, 13, 22

Tree Retention Value

Determined by using the Retention Value - Priority Matrix of the *IACA Significance of a Tree, Assessment Rating System* (STARS)© (IACA, 2010), Appendix B.

Retention Value

- High** – Priority for Retention
Medium – Consider for Retention
Low – Consider for Removal
Remove - Priority for Removal

Retention Value	High Priority for Retention	Medium Consider for Retention	Low Consider for Removal	Remove Priority for Removal
Tree No. / Stand No.	1/1, 5, 17/3*, 19	2, 4, 6, 7, 8, 9, 10, 11, 14, 15, 16, 18, 20/4*, 21/5	3, 12/2, 13,	22

* Trees located within the neighbouring property and should be retained and protected.