



Arboriculture Impact Assessment

**Lot 4 in DP29244
77 Kulgoa Road, Pymble NSW 2073**

Commissioned By: Mr & Mrs Leece
C/-Natalie Richter Planning
PO Box 59,
MT COLAH NSW 2079

Date: 11 July 2024
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Revision: 5

Prepared By: Meredith Gibbs (Dip. Hort. Arb.)
Arboriculture Qualification AQF 5

Australis Tree Management
PO Box 3453
DURAL NSW 2158
Email: info@australistrees.com.au

Document Details

Document Title	Arboriculture Impact Assessment
Client	Mr & Mrs Leece
Client Contact	Natalie Richter Planning
Property Details	77 Kulgoa Road, Pymble
Legal Description	Lot 4 in DP29244
LGA	Ku-ring Gai Council
Zone	C4 - Environmental Living: (pub. 5-11-2021)
Written By	Meredith Gibbs

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Meredith Gibbs
Australis Tree Management
11 July 2024

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1. Summary

Australis Tree Management has been commissioned by Natalie Richter Planning on behalf of their client Mr & Mrs Leece to complete an *Arboriculture Impact Assessment* (AIA) in accordance with *AS4970 Protection of trees on development sites*. 'TreeAZ' (Version 10.10-ANZ) was used to determine retention values.

The *Arboriculture Impact Assessment* undertook assessment of sixty-seven (67) existing trees within the subject site and within 3m of boundaries on adjoining properties to establish tree retention values the health and condition of the trees, potential impacts from proposed works and to provide recommendations regarding tree retention and tree protection. The tree defects and symptoms that were encountered have been discussed and a detailed tree schedule is included in Appendix A.

The proposed development is for demolition of the dwelling and tennis court with associated works for the subdivision of the sites into 2 lots.

The inspection at 77 Kulgoa Road, Pymble was performed on the 2 February 2023 by visibly inspecting the trees from accessible points at ground level from the subject site and public areas only. I completed a modified *Tree Survey Form* (Matheny & Clark, 1994), applied 'TreeAZ' ratings (Barrell, 2016) as well as taking supporting photographs of the trees.

In total sixty-seven (67) trees were assessed. All trees are selected for retention and will require tree protection measures to ensure their long-term survival.

		Onsite	Adjoining
TreeAZ	'A'	25 trees	5 trees
	'Z'	26 trees	11 trees

Recommendations are provided to protect trees from the activities associated with the proposed demolition works areas. Trees proposed for retention will require tree protection measures throughout the development works to ensure their long-term survival. Recommendation is also made to restrict vehicle access to one driveway to protect the low canopies of trees.

The *Tree Protection Plan and Specifications* form part of the overall construction documentation package. These must be followed throughout all construction phases of the project. The tree protection plans provide a layout of tree protection fencing and other tree protection measures.

Tree protection specifications are detail requirements for the qualified project arborist engaged throughout the construction process. It includes tree management, monitoring guidelines and project hold points. All tree protection measures are to be in place and certified by the project arborist prior to commencement of demolition works or site establishment. All TPZ areas are to be maintained throughout the period of the works.

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Acronyms

Abbreviation	Term	Definition
ATM	Australis Tree Management	
DBH	Diameter at breast height	The diameter of a tree's stem typically measured with a diameter tape at 1.4 metres height (AS4970-2009).
DCP	Development Control Plan	
ENCR	Encroachment	Proposed or existing TPZ encroachments (AS4970-2009)
LEP	Local Environmental Plan	
LGA	Local Government Authority	
SRZ	Structural Root Zone	The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree (AS4970-2009).
TPP	Tree Protection Plan	Showing the TPZs for trees being retained taking into account the proposed development (AS4970-2009).
TPZ	Tree Protection Zone	The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable (AS4970-2009).

2. Introduction

2.1. Brief

Mr and Mrs Leece have provided instruction to assess the health and condition of the selected trees located at 77 Kulgoa Road, Pymble. This includes selected trees within the vicinity of the proposed works. To prepare and Arboriculture Impact Assessment on the proposed impacts of the development works on the selected trees. This report will provide recommendations regarding tree protection during the demolition process.

2.2. Project Description

The development proposed is for the demolition of the existing dwelling at No. 77 for the subdivision into 2 lots. All trees are proposed for retention.

2.3. Site Description

The site is a well-kept residential site has natural indigenous with planted native and exotic vegetation throughout. The grounds are in good condition.

2.4. Aims

- Undertake field surveys for tree health and condition.
- Conduct a literature review on the tree defects and symptoms.
- Search databases for relevant tree species information including Council Tree Protection Policies.
- Identify Tree Protection Zones for all trees assessed and assess the likely impacts from the development on the trees.
- Provide preliminary advice and tree protection recommendations for trees proposed for retention and protection.

2.5. Qualifications and Experience

This report has been based upon site observations and the assessment of the subject trees. Conclusions have been reached from experience and follow up research. Qualification details are included in the appendix.

Australis Tree Management (Meredith Gibbs) provides consulting arborist services only and does not provide services such as climbing, pruning, tree removal, root investigations or root pruning. This report is and impartial professional assessment only and does not derive any financial benefit from specifying pruning or other physical services.

2.6. Documents Provided

Supplier	Date Supplied	Document Date	File Name
Hammond Smealie & Co Pty Ltd	22/12/2022	30/11/2022	14989 SUB DESIGN WITH TREES.pdf
	30/1/2023	30/11/2022	14989 SUB DESIGN BE.pdf

Table 1. Documents Provided

2.7. Scope

This report is only concerned with the health and condition of the subject trees and the potential impacts from the proposed development. Root mapping, invasive structural strength of the trees, soils assessments or aerial inspections were not performed. This report has been prepared in accordance with Ku-ring Gai Council requirements. It includes a detailed assessment based on the site visit and the documents provided.

Recommendations may be provided regarding alterations to the proposed design or construction methods to mitigate detrimental impacts on the subject trees. All tree species assessed (including unprotected trees) are located in the 'Tree Schedule' in Appendix A.

2.8. Field Visit

The unaccompanied site visit was conducted on Thursday, 2 February 2023. All observations were from ground level without detailed investigations. The weather at the time of the inspection was sunny and clear with adequate visibility

Location Map

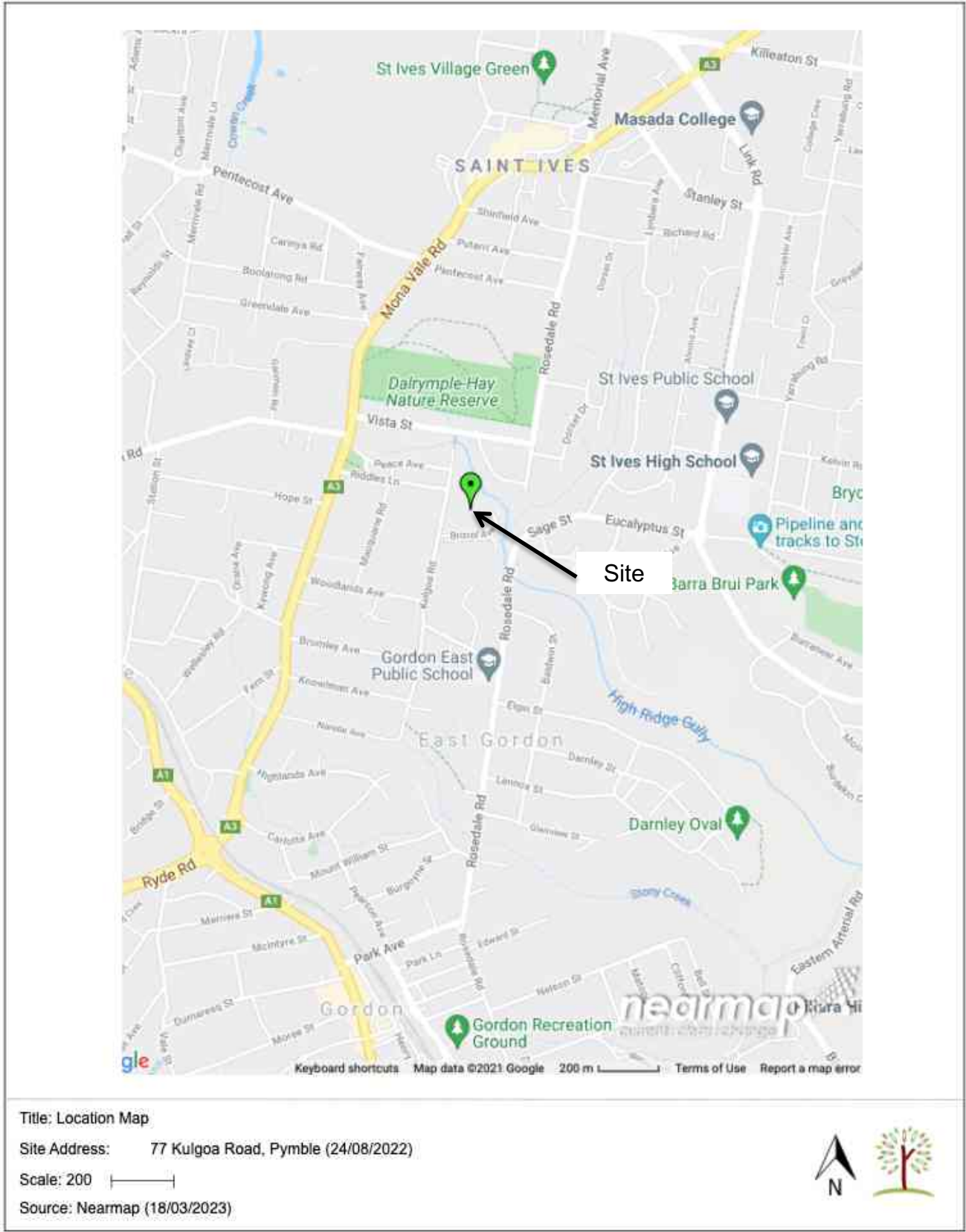


Figure 1. Location Map

3. The Site

3.1. Brief Site Description

Kulgoa Road is located in the residential suburb of Pymble, located approximately 20km north from the Sydney CBD in the Upper North Shore region. Number 77 is on the eastern side of the road surrounded by similar residential developments.

The site is zoned as C4 - Environmental Living: (pub. 5-11-2021) and is not located within the council specified heritage area and does not contain any heritage items. The properties consist of dwellings, garages and swimming pools.

The subject site is located within the Ku-ring Gai LGA and is assessed and protected under the legislation and controls in Table 1. Note that Ku-ring Gai Council is still transitioning from pre-amalgamation LEPs and DCPs.

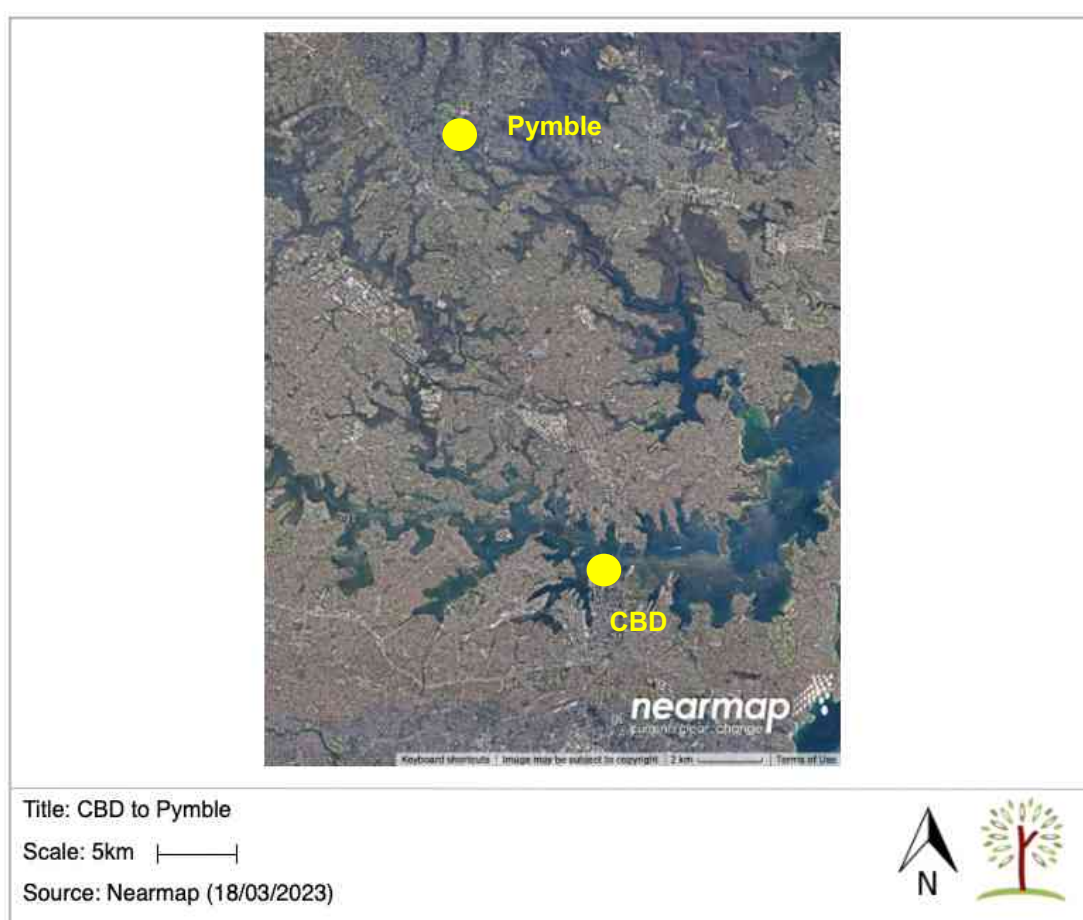
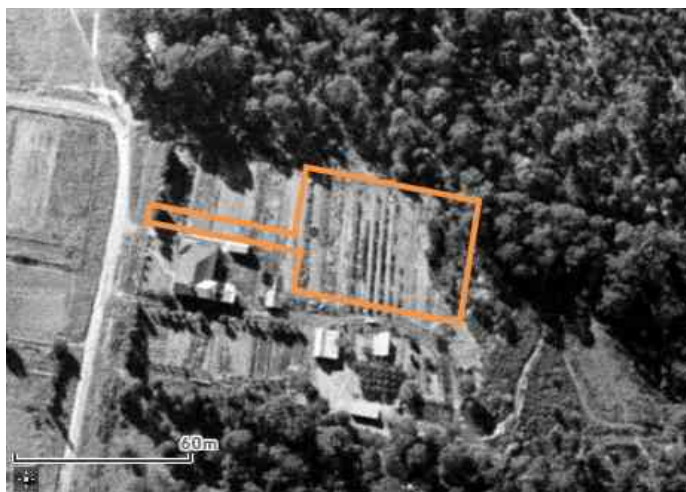


Figure 2. CBD to Pymble Map

3.2. Site History

A review of historical aerial imagery shows that vegetation on the site is regrowth from historical clearing as well as from ongoing maintenance regimes. (SIXmaps 2022).



Title: 1943 Aerial Imagery
Source: Spatial Map Viewer (22/6/2024)

Figure 3. 1943 Aerial Imagery



20/10/2009



23/6/2023

Title: Aerial Imagery
Source: Nearmap (22/6/2024)



Figure 4. Aerial Site Images

3.3. Climate

Pymble is located approximately 12km from the nearest weather station at Sydney Olympic Park. The area has an annual mean average temperature between 16.9°C and 27.6°C, with the annual mean rainfall averaging 190mm. The site is flat and exposed to the east with prevailing winds coming from the south.

3.4. Microclimates

The site is moderately protected by residential buildings and vegetation creating protection from strong winds. The trees located on the southern side of the site influence the microclimate in that area by providing significant protection from poor weather and provide significant shading. The existing grasses and gardens also result in cooler microclimates. The available light levels throughout the site are adequate for vegetation growth. There is no permanent fixed irrigation on site.

3.5. Location of the Trees

The assessed trees are located predominately around the boundaries of the site. The trees have been located on the supplied site plan (Gary Skow dated 30/11/2022) and numbered accordingly. These plans are illustrative purposes only and should not be used directly for scaling measurements. Tree No.'s. 37, 40, 66, 90 and 91 were not located on the supplied survey plan and have been approximately located therefore inaccuracies may occur.

3.6. Underground Services

Underground Service locations were not identified on the supplied site survey.

3.7. Onsite Vegetation

The site contains indigenous, planted native and exotic tree species of varying ages and stages of maturity. Indigenous vegetation community is located onsite. Please refer to Ecologist report for more information. The subject site has been partially modified with the removal of most of the native under storey, ground cover plants and shrubs prior to 1943. The subject dominant trees together with other indigenous trees in the surrounding residences are connected to the remainder of the ecological communities nearby. Young indigenous trees are highly valued for retention and protection.

Indigenous tree species assessed are:

- Tree No. 71 *Angophora costata* (Smooth-barked Apple)
- Tree No. 70 *Eucalyptus pilularis* (Blackbutt)
- Tree No. 87 *Eucalyptus punctata* (Grey Gum)
- Tree No.'s 65, 68, 69, 80 & 81 *Eucalyptus saligna* (Sydney Blue Gum)
- Tree No.'s 74 & 79 *Pittosporum undulatum* (Sweet Pittosporum)
- Tree No.'s 72, 73 & 105 *Syncarpia glomulifera* (Turpentine)

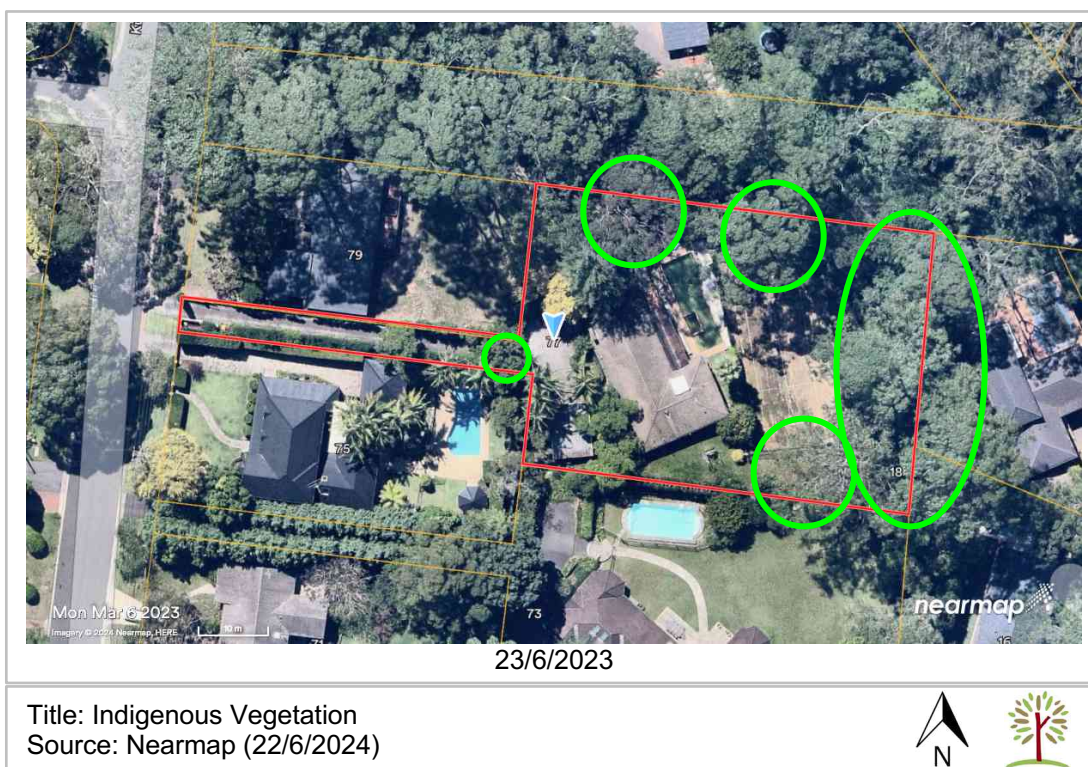


Figure 5. Indigenous Vegetation

4. Urban Heat Island

4.1. Urban Development

Increased urban densification and the loss of green spaces means that mature trees are increasingly valuable for to reduce heat. Existing trees require sufficient access to soil water or must be irrigated and in prime condition to provide maximum benefits.

The Urban Heat Island (UHI) dataset measures the effects of urbanisation on land surface temperatures across Sydney Greater Metropolitan Area for the Summer of 2015-2016. UHI shows the variation of temperature to a non-urban vegetated reference, such as heavily wooded areas or national parks around Sydney (SEED 2022). The UHI indicates that the subject site is 1.8°C above baseline.

Residential areas are exposed to significant urban heat island effects caused by thermal energy being absorbed into man-made hard surfaces and radiating heat back into the local environment (NSW SEED).

Hard surfaces absorb heat and become significantly hotter than vegetated areas. Trees are the most effective infrastructure elements for localised cooling and mature trees have higher cooling potential than smaller younger trees, though young trees have the greatest potential for cooling in the future.

Daytime near-surface air temperature declined with increasing height and canopy density providing significant cooling benefits. However, reversed at night when tall trees with dense canopies restricted longwave radiative cooling and trapped warm air beneath their crowns. To mitigate increasing urban heat through trees can be devised to local scale (Wujeska-Klaue and Pfautsch, 2020).

4.2. Canopy Cover

The NSW government has set targets to increase the urban tree canopy cover throughout Sydney with a target of 40% tree canopy cover in suburban areas. The current percentage of canopy coverage for this site is 67% (SEED, 2022).

4.3. Benefits of Trees

Trees provide shade and evaporative cooling which helps reduce the urban heat island effect. Increased urban densification and the loss of green spaces means that mature trees are increasingly valuable for to reduce heat. Existing trees require sufficient access to soil water or must be irrigated and in prime condition to provide maximum benefits. Trees transperitive cooling process reduces the thermal load from sunshine.

5. Relevant Government Legislation

5.1. Relevant Government Legislation

Local Government
Ku-ring Gai Council Local Environmental Plan (2015)
Ku-ring Gai Council Development Control Plan (2015)
State Government
Biodiversity and Conservation (2021)
Heritage Act (1977)
Environment Protection and Biodiversity Conservation Act (1999)
Vegetation in Non-Rural Areas [NSW] (2017)

Table 2. Relevant Government Legislation

5.2. Vegetation in Non-Rural Areas [NSW] (2017)

The State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 includes provisions requiring the preservation of trees and bushland within Central Coast Council LGA.

Aims of Policy

The aims of this Policy are:

- (a) to protect biodiversity values of trees and vegetation in non-rural areas of the State, and
- (b) to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.

5.3. SEPP (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 includes provisions requiring the preservation of trees and bushland within Ku-ring Gai Council LGA.

5.4. Council Tree Protection

This report relies on the information contained within Ku-ring Gai Local Environmental Plan and Development Control Plan. This report may include trees on adjoining properties that are likely to be impacted by the proposed development regardless of the definition contained in the Tree and Vegetation DCP Part 13. Council may require a greater setback from proposed structures to ensure the preservation and protection of the tree. A separate permit to prune any trees within or adjacent to the property and/or any pruning of tree roots must be obtained from Council prior to any works being undertaken.

5.5. Exempt Tree Species

The following tree species are listed in councils' list of exempt species, exempt of works or undersized.

Tree No.	Species	Exempt Species or Undersize
40, 77 & 104	<i>Celtis sp</i> (Nettle)	Exempt Species
82	<i>Ligustrum lucidum</i> (Broad Leaf Privet)	Exempt Species

Table 3. Exempt Tree Species

5.6. Threatened Species

The subject tree species are not listed in the NSW Biodiversity Conservation Act (2016) or the Environment Protection and Biodiversity Conservation Act (1999).

5.7. Biosecurity Act 2015

The following tree species are listed in the Biosecurity Act (2015) and classed as 'General'. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimized, so far as is reasonably practicable.

Tree No.	Species
40, 77 & 104	<i>Celtis sinensis</i> (Chinese Nettle)
82	<i>Ligustrum lucidum</i> (Broad Leaf Privet)
74 & 79	<i>Pittosporum undulatum</i> (Sweet Pittosporum)

Table 4. Biosecurity Act Listed Tree Species

6. Tree Assessment

6.1. Information Collected

Information collected includes tree species, dimensions, tree health and condition, tree assessment ratings and tree protection zones etc. Trees located on adjoining properties will be inspected from the ground on the subject site or public land only. All relevant information is included in the Tree Schedule (Appendix A). The inspection (*Visual Tree Assessment, Mattheck & Breloer, 1994*) was of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level.

In accordance with AS 4970-2009 tree trunk diameters were measured with a diameter tape at 1.4m high (unless stated). Tree heights are measured with a clinometer and canopy spreads estimated accordingly and confirmed with Near Map.

Post site inspection calculations and assessments were made of the following and are included in the Tree Schedule located in Appendix A.

6.2. Methodology

The following relevant information was compiled for consideration of the proposed works. Further information can be found in the appendices.

- *Tree Survey Form* (Matheny & Clark, 1994)
- *Visual Tree Assessment* (Mattheck & Breloer, 1994)
- *TreeAZ* (Barrell, 2010) (Version 10.10-ANZ)
 - **'A'** - Moderate and high-quality trees suitable for retention for more than 10 years, and worthy of being a material constrain
 - **'Z'** - Low quality trees not worthy of being material constraint
 - *TreeAZ 'A' category trees are not required to be retained, although this is recommended. TreeAZ 'Z' category trees are not required to be removed. If they pose no risk to life or property it is recommended that they be retained.*
- Australian Standard 4970-2009 Protection of trees on development sites
 - *This document describes the best practices for the planning and protection of trees on development sites. The procedures described are based on plant biology and current best practices as covered in recently published literature.*
 - *In accordance with AS 4970-2009 tree trunk diameters were measured with a diameter tape at 1.4m high (unless stated). Tree heights are measured with a clinometer and canopy spreads estimated accordingly.*
 - *Tree Protection Zone - Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and*

- contiguous with the TPZ.*
 - *Structural Root Zone - The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.*
 - *Minor Encroachment - If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. Variations must be made by the project arborist considering relevant factors.*
 - *Major Encroachment - If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors.*
- AS 4373 - 2007 Pruning of amenity trees
 - *The objective of this revision is to reflect current arboricultural practices. The recommendations given in this Standard are intended to apply specifically to urban and amenity trees but exclude pruning for fruit production and silviculture.*

6.3. Species identification

Tree species identification of the subject trees was determined by visible features only at the time of the inspection. Every effort is made to correctly identify the subject trees where time permits. It is not based upon comparison against herbarium specimens. Photographs are compared with varying text listed in 'References'.

6.4. Photography

Photographs were taken using an iPhone, iPad or Nikon D5000. In low light levels photographs maybe altered to improve visual quality, this involves adjustments to exposure, contrast, reduction of shadows and increased sharpness. No adjustments to vibrancy that alter natural colours were applied.

7. Results

A total of sixty-seven (67) trees were assessed on site and within 5m of boundaries.

* Exempt (Unprotected) trees – 36, 38, 39, 40, 41, 44, 67, 77, 82, 103, 104, 106, 107, 108, 109 & 110

7.1. 'TreeAZ' and Life Expectancy

7.1.1. 'A' - Moderate and high-quality trees suitable for retention for more than 10 years, and worthy of being a material constraint.

Tree No.	Species	Life Expectancy
72, 73 & 105	<i>Syncarpia glomulifera</i> (Turpentine)	40+yrs
71	<i>Angophora costata</i> (Smooth-barked Apple)	40+yrs
88	<i>Cedrus deodara</i> (Deodar Cedar)	40+yrs
65, 68, 69, 80 & 81	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	40+yrs
47	<i>Podocarpus elatus</i> (Brown Pine)	40+yrs
48	<i>Eucalyptus microcorys</i> (Tallowwood)	40+yrs
49 & 55	<i>Glochidion ferdinandi</i> (Cheese Tree)	40+yrs
54	<i>Thuja plicata</i> (Western Red Cedar)	15-40yrs
56 - 58, 89 - 94	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm) multiple	40+yrs
59 & 60	<i>Jacaranda mimosifolia</i> (Jacaranda)	40+yrs
54	<i>Thuja plicata</i> (Western Red Cedar)	15-40yrs
62	<i>Livistona chinensis</i> (Chinese Fan Palm)	40+yrs
70	<i>Eucalyptus pilularis</i> (Blackbutt)	40+yrs
74	<i>Pittosporum undulatum</i> (Sweet Pittosporum)	5-15yrs
75	<i>Brachychiton acerifolius</i> (Illawarra Flame Tree)	40+yrs
76	<i>Grevillea robusta</i> (Silky Oak)	15-40yrs
87	<i>Eucalyptus punctata</i> (Grey Gum)	40+yrs
89	<i>Ulmus glabra</i> (Scotch Elm)	40+yrs

Table 5. TreeAZ 'A' Trees and Life Expectancy

7.1.2. **'Z'** - Low quality trees not worthy of being material constraint.

Tree No.	Species	Life Expectancy
41	<i>Viburnum odoratissimum</i> (Sweet Viburnum)	15-40yrs
35 & 42	<i>Juniperus communis</i> (Juniper)	15-40yrs
36	<i>Buxus sp</i> (Buxus)	15-40yrs
37, 43, 61 & 103	<i>Camellia reticulata</i> (Reticulata Camellia)	40+yrs
38 & 79	<i>Pittosporum tenuifolium</i> (Pittosporum)	15-40yrs
40 & 104	<i>Celtis australis</i> (Nettle Tree)	40+yrs
50	<i>Grevillea robusta</i> (Silky Oak)	<5yrs
53	<i>Callistemon salignus</i> (Willow Bottlebrush)	5-15yrs
63	<i>Cedrus deodara</i> (Deodar Cedar)	15-40yrs
64	<i>Jacaranda mimosifolia</i> (Jacaranda)	40+yrs
66	<i>Stenocarpus sinuatus</i> (Fire Wheel Tree)	40+yrs
67	Dead	dead (no hollows)
77	<i>Celtis australis</i> (Nettle Tree)	15-40yrs
78	<i>Callistemon salignus</i> (Willow Bottlebrush)	15-40yrs
82	<i>Ligustrum lucidum</i> (Large Leaf Privet)	40+yrs
83 – 86, 95, 97 - 101	<i>Livistona chinensis</i> (Chinese Fan Palm)	40+yrs
96	<i>Howea forsteriana</i> (Kentia Palm)	40+yrs
102	<i>Ravenea rivularis</i> (Majesty Palm)	40+yrs
106 - 110	<i>Tibouchina lepidota</i> 'Alstonville' (Alstonville Tibouchina)	<5yrs

Table 6. *TreeAZ* 'Z' Trees and Life Expectancy7.2. **Tree Significance**

Tree Significance Assessment Criteria (IACA)

Low	Medium	High
49, 54 – 58, 62, 64, 74, 75, 83 – 86, 89 - 102	34-38, 40, 42– 44, 53, 59 – 61, 63, 66, 67, 76 – 70, 82, 103, 104, 106 - 110	65 68 – 73, 80, 81, 87, 88 & 105

Table 7. Tree Significance

7.3. **Determining the Tree Protection Zone (AS4970-2009)**

- The radius of the TPZ is calculated for each tree by multiplying its DBH × 12.
- $TPZ = DBH \times 12$
- Where DBH = trunk diameter measured at 1.4 m above ground
- **Radius** is measured from the centre of the stem at ground level.

- A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required). Clause 3.3 covers variations to the TPZ.
- The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 m outside the crown projection.

7.4. Trees Proposed for Retention

All trees are proposed for retention. Trees located adjacent to structures proposed for demolition that will require strict protection are listed below.

7.5. Trees Located Adjacent to Demolition Works

Tree No.	Species	TPZ
59	<i>Jacaranda mimosifolia</i> (Jacaranda)	4.8m
61	<i>Camellia reticulata</i> (Reticulata Camellia)	2.4m
65	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	12m
66	<i>Stenocarpus sinuatus</i> (Fire Wheel Tree)	2m
69	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	7.2m
80	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	9.6m
81	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	4.8m

Table 8. Trees Located Adjacent to Demolition Works

7.6. Trees Located Adjacent to Indicative Building Envelopes

The following trees have indicative building envelopes within their TPZ's. These trees must be given the opportunity for retention within any future proposed developments.

Tree No.	Species	TPZ	Proposed Encroachment
37	<i>Camellia reticulata</i> (Reticulata Camellia)	2.4m	100%
42	<i>Juniperus communis</i> (Juniper)	2.0m	7.2%
61	<i>Camellia reticulata</i> (Reticulata Camellia)	2.4m	100%
62	<i>Livistona chinensis</i> (Chinese Fan Palm)	3.0m	100%
63	<i>Cedrus deodara</i> (Deodar Cedar)	6.0m	4.0%
65	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	12.0m	6.2%
77	<i>Celtis australis</i> (Nettle Tree)	7.2m	1.8%
78	<i>Callistemon salignus</i> (Willow Bottlebrush)	5.1m	4.9%
80	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	9.6m	3.5%
81	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	4.8m	6.9%
83	<i>Livistona chinensis</i> (Chinese Fan Palm)	3.0m	28.6%
95	<i>Livistona chinensis</i> (Chinese Fan Palm)	2.4m	28.6%
96	<i>Howea forsteriana</i> (Kentia Palm)	2.0m	38.6%

Table 9. Onsite Trees Proposed for Removal

7.7. Trees Proposed for Pruning

There are no trees that require pruning for the proposed development works.

8. The Proposed Development

The development proposed is for the subdivision of the sites into 2 lots and for the demolition of selected structures. The following must be considered and assessed to their impacts to trees.

8.1. Tree Tolerance

Generally, older and larger trees tolerate construction impacts less. Different species also have different tolerance of injury and disturbance. Importantly it needs to be stressed, that a tree does not “heal” from injury. Any injury made to a tree, results in the tree expending considerable energy reserves to create new growth that “seals” and surrounds a wound and then attempting to compensate structurally and physically for any losses. Impacts to trees are therefore cumulative and a series of otherwise small and unrelated impacts can easily result in the death of a tree.

A tree that is already compromised or showing signs of stress is far less likely to tolerate construction impacts due to its lower levels of energy reserves and already weakened state. Therefore, a tree that is only in a fair condition or poor condition is less likely to tolerate construction impacts than a young tree in good or excellent condition.

Weakened or stressed trees are also far less able to combat the myriad of normal environmental stresses and pathogens that are naturally imposed against them such as drought, decay, fungi, bacteria and insect pests.

The site works proposed will result in site disturbances, excavation and re-grading. This means that some trees will require removal. Only those trees that have a reasonable and practical chance of being successfully retained have been targeted for retention and protection.

8.2. Demolition

The demolition and removal of structures can cause damage to trees if work occurs within TPZ's. Machinery used for demolition must stay outside of TPZ's or within existing hard surface or previous structure platforms to prevent compaction of the root system and damage to the canopy. Tree protection fencing must be in place prior to demolition. If demolition of structures must occur within any TPZ then organic mulch must be applied at a depth of no greater than 70mm. If a temporary path is required within any TPZ then a cell structure of a suitable strength can be temporarily laid.

8.3. Approved Tree Removal

Trees approved by council for retention must be protected during the removal of other trees approved for removal. Roots larger than 50mm originating from removed trees must remain without root zone disturbances.

8.4. Construction Activities

The proposed demolition activities are likely to result in site disturbances and may cause detrimental impacts to the subject trees. Generally, soil disturbances occur at a minimal 1.5m from the works. Soil compaction can occur with foot traffic as well as

machinery. This reduces available water and oxygen to penetrate the root zone resulting in death to fibrous roots used for moisture and nutrient uptake.

8.5. Vehicle Access

All construction access and deliveries are to be made from the driveway for No. 77 Kulgoa Road.

8.6. Proposed Earthworks

Earthworks machinery cause significant soil compaction which causes the top layer of roots to die. Roots require oxygen to respire and function. Soil compaction also kills mycorrhizal fungi (a beneficial fungi).

Cutting soil levels can seriously damage tree roots. The removal of woody roots can jeopardise the tree stability as well as significantly reducing its life expectancy and removing shallow feeder roots will result in immediate water stress. The maximum amount of undisturbed soil within any TPZ is beneficial.

Raising soil levels within any TPZ reduces gaseous exchanges. Overtime, decay and diseases may develop and reduce the life expectancy of the tree. Impacts may not be noticeable for many years.

8.7. Proposed Fencing

Proposed fences or boundary walls located within TPZ's must be constructed at the existing fence depth or proposed fence sections or panels must be suspended. Support footings or fence support posts must be hand excavated allowing a minimum 100mm distance from roots measuring greater than 50mm in diameter. Hand excavated must occur within any TPZ to protect roots measuring greater than 50mm in diameter.

8.8. Erosion and Sediment Control Fencing

Erosion and sediment control fencing located within the TPZ's must not be excavated. A soil strip may be mounded 200mm. Star pickets must not be installed within any Structural Root Zone.

8.9. Soil Water Availability

Trees adapt to the existing distribution of soil water in its own particular situation and to the usual fluctuations of water supply that exists. Newly constructed roads, paths, roofs and other impermeable surfaces located upslope from trees prevent rainwater from entering the soil and seeping downslope to trees. Therefore, removing rainwater and redirecting soil water will lead to a deterioration in health and reduced life expectancy for trees located the down slope from the development.

8.10. Wind Exposure

Trees growing in dense stands become prone to windthrow when surrounding trees are removed, which exposes the remaining trees to the full force of the wind. Trees growing in an open environment are generally shorter and strongly tapered. The construction of buildings adjacent to trees results in the removal of surrounding trees that provide protection. Buildings also alter to natural wind directions. These changes

are likely to increase wind stresses on retained trees, which may result in branch failures until the tree has time to adapt and strengthen to the new conditions.

8.11. Proposed Encroachment Impacts

- Trees with a <10% encroachment proposed are considered to have a 'minor' encroachment in accordance with AS4970-2009 or low-level impact. These trees can be retained and protected during the development processes.
- Trees with between 10% and 20% encroachment proposed are considered to have a 'major' encroachment in accordance with AS4970-2009 or a moderate level of impact and require individual specifications for work within their TPZ's.
- Trees with >20% encroachment proposed are considered to have a significant level of impact where roots and canopy may be significantly impacted on and are unlikely tolerate the proposed works.

9. Discussion

9.1. Trees Located Adjacent to Demolition Works

9.1.1. Tree No. 59 *Jacaranda mimosifolia* (Jacaranda)

- 9.1.1.1. This planted, exotic tree is located on site and is protected by council. This young tree has a spreading habit and is growing in a dominant class with adequate form. It is expected to increase in size by approximately 100% as it matures. It has a dominant trunk with the crown showing average (3) health. The amount of deadwood was determined as low and small being approximately <10% of the canopy with epicormic growth being varying ages and sizes at approximately <10%. No significant issues were sighted; therefore, the structural condition appears to be fair.
- 9.1.1.2. The root zone is garden with a garage and the dwelling nearby. The surrounding structures provide partial protection from strong winds and the tree provides minor shading to an existing open space.
- 9.1.1.3. This tree has a 'TreeAZ' rating of 'A2' and an estimated life expectancy of 40+yrs. It is considered low in significance (IACA, 2010).
- 9.1.1.4. The existing dwelling is proposed for demolition and located approximately 3.6m from the trunk within approximately 7% of the TPZ. Therefore, the tree will require protection.

9.1.2. Tree No. 61 *Camellia reticulata* (Reticulata Camellia)

- 9.1.2.1. This planted, exotic tree is located on site and is protected by council. This mature tree has a spreading habit and is growing in a dominant class with dense form. It is expected to increase in size by approximately 50% as it ages. It has a multi trunked trunk with the crown showing good (4) health with no significant issues sighted.
- 9.1.2.2. The root zone is grass with the dwelling and a pool fence nearby. The tree does not provide significant shading.
- 9.1.2.3. This tree has a 'TreeAZ' rating of 'Z1' and an estimated life expectancy of 40+yrs. It is considered low in significance (IACA, 2010).

9.1.3. Tree No. 65 *Eucalyptus saligna* (Sydney Blue Gum)

- 9.1.3.1. This seeded, indigenous tree is located on site and is protected by council. This mature tree has a spreading habit and is growing in a codominant class with adequate form. It is expected to increase in size by approximately 10% as it ages. It has a dominant trunk with the crown showing average (3) health. The amount of deadwood was determined as varying ages and sizes being approximately 10%-25% of the canopy with epicormic growth being varying ages and sizes at approximately 10%-25%. The tree has minor previously failed branches, one with bracket fungi, 5-10cm diameter trunk cavities. The structural condition appears to be fair without structural strength testing to determine otherwise.
- 9.1.3.2. The root zone is grass with a tennis court nearby. The tree provides major shading to an existing open space and currently provides screening to an adjoining property.
- 9.1.3.3. This tree has a 'TreeAZ' rating of 'A2' and an estimated life expectancy of 40+yrs. It is considered high in significance (IACA, 2010).
- 9.1.3.4. The existing tennis court is proposed for demolition and located approximately 1.5m from the trunk within approximately 19% of the TPZ. Therefore, the tree will require strict protection.

9.1.4. Tree No. 66 *Stenocarpus sinuatus* (Fire Wheel Tree)

- 9.1.4.1. This planted, native tree is located on site and is protected by council. This young tree has an upright habit and is growing in a dominant class with dense form. It is expected to increase in size by approximately 100% as it ages. It has a dominant trunk with the crown showing good (4) health. The amount of deadwood was determined as low and small being approximately <10% of the canopy with epicormic growth being low and young at approximately <10%. The tree has basal suckers, and the structural condition appears to be fair.
- 9.1.4.2. The root zone is weeds with a tennis court nearby. The nearby vegetation provides partial protection from strong winds and the tree provides minor shading to an existing open space as well as currently provides screening to an adjoining property.
- 9.1.4.3. This tree has a 'TreeAZ' rating of 'Z1' and an estimated life expectancy of 40+yrs. It is considered low in significance (IACA, 2010).

- 9.1.4.4. The existing tennis court is proposed for demolition and located approximately 1m from the trunk within approximately 6% of the TPZ. Therefore, the tree will require strict protection.
- 9.1.5. Tree No. 69 *Eucalyptus saligna* (Sydney Blue Gum)
- 9.1.5.1. This seeded, indigenous tree is located on site and is protected by council. This mature tree has a spreading habit and is growing in a codominant class with adequate form. It is expected to increase in size by approximately 10% as it ages. It has a dominant trunk with the crown showing average (3) health. The amount of deadwood was determined as low and small being approximately <10% of the canopy with epicormic growth being low and young at approximately <10%. No significant issues sighted; therefore, the structural condition appears to be fair.
- 9.1.5.2. The root zone is grass with the tennis court nearby. The tree provides major shading to an existing open space as well.
- 9.1.5.3. This tree has a 'TreeAZ' rating of 'A2' and an estimated life expectancy of 40+yrs. It is considered high in significance (IACA, 2010).
- 9.1.6. Tree No. 80 *Eucalyptus saligna* (Sydney Blue Gum)
- 9.1.6.1. This remnant, indigenous tree is located on site and is protected by council. This mature tree has a spreading habit and is growing in a dominant class with adequate form. It is expected to increase in size by approximately 10% as it ages. It has a dominant trunk with the crown showing average (3) health. The amount of deadwood was determined as varying ages and sizes being approximately 10%-25% of the canopy with epicormic growth being varying ages and sizes at approximately 10%-25%. No significant issues were sighted.
- 9.1.6.2. The root zone is grass with a tennis court nearby. The nearby vegetation provides partial protection from strong winds and the tree provides major shading to an existing open space.
- 9.1.6.3. This tree has a 'TreeAZ' rating of 'A2' and an estimated life expectancy of 40+yrs. It is considered high in significance (IACA, 2010).
- 9.1.6.4. The existing tennis court is proposed for demolition and located approximately 3.7m from the trunk within approximately 22% of the TPZ. Therefore, the tree will require strict protection.

9.1.7. Tree No. 81 *Eucalyptus saligna* (Sydney Blue Gum)

- 9.1.7.1. This remnant, indigenous tree is located on site and is protected by council. This semi mature tree has a spreading habit and is growing in a dominant class with adequate form. It is expected to increase in size by approximately 20% as it ages. It has a dominant trunk with the crown showing average (3) health. The amount of deadwood was determined as varying ages and sizes being approximately 10%-25% of the canopy with epicormic growth being varying ages and sizes at approximately 10%-25%. No significant issues were sighted.
- 9.1.7.2. The root zone is grass with no structures nearby. The nearby vegetation provides partial protection from strong winds and the tree provides major shading to an existing open space.
- 9.1.7.3. This tree has a 'TreeAZ' rating of 'A2' and an estimated life expectancy of 40+yrs. It is considered high in significance (IACA, 2010).
- 9.1.7.4. The existing tennis court is proposed for demolition and located approximately 4.3m from the trunk within approximately 1% of the TPZ. Therefore, the tree will require protection.

9.2. Impact on Surrounding Area

- 9.2.1. The existing trees provide significant shading and protection from strong winds and storms as well as some screening from adjoining properties.
- 9.2.2. The proposed demolition works are unlikely to detrimentally impact the health and stability of the subject significant trees.

10. Recommendations

10.1. Trees Requiring Protection

- 10.1.1. Tree No. 59 *Jacaranda mimosifolia* (Jacaranda) is a dominant and young exotic tree located onsite. It is in fair condition with a 'TreeAZ' rating of 'A2', a 40+yrs life expectancy and low in significance. The existing dwelling proposed for demolition encroaches the 4.8m TPZ by a minor 7%.
- Recommendations
 - Demolition machinery to work from hard surfaces only
 - Tree protection fencing required
- 10.1.2. Tree No. 61 *Camellia reticulata* (Reticulata Camellia) is a dominant and mature exotic tree located onsite. It is in fair condition with a 'TreeAZ' rating of 'Z1', a 40+yrs life expectancy and low in significance. The existing dwelling proposed for demolition encroaches the 2.4m TPZ by a minor 6%.
- Recommendations
 - Demolition machinery to work from hard surfaces only
 - Tree protection fencing required
- 10.1.3. Tree No. 65 *Eucalyptus saligna* (Sydney Blue Gum) is a codominant and mature indigenous tree located onsite. It is in fair condition with a 'TreeAZ' rating of 'A2', a 40+yrs life expectancy and high in significance. The existing tennis court proposed for demolition encroaches the 12m TPZ by a major 19%.
- Recommendations
 - Demolition machinery to work from hard surfaces only
 - Mulch using composted leaf mulch
 - Apply micro irrigation to TPZ remaining connected to a designated water source
 - Tree protection fencing required
- 10.1.4. Tree No. 66 *Stenocarpus sinuatus* (Fire Wheel Tree) is a dominant and young native tree located onsite. It is in good condition with a 'TreeAZ' rating of 'Z1', a 40+yrs life expectancy and low in significance. The existing tennis court proposed for demolition encroaches the 2.4m TPZ by a minor 6%.
- Recommendations
 - Demolition machinery to work from hard surfaces only
 - Tree protection fencing required

10.1.5. Tree No. 69 *Eucalyptus saligna* (Sydney Blue Gum) is a codominant and mature indigenous tree located onsite. It is in fair condition with a 'TreeAZ' rating of 'A2', a 40+yrs life expectancy and high in significance. The existing tennis court proposed for demolition encroaches the 7.2m TPZ by a major 17%.

- Recommendations
 - Demolition machinery to work from hard surfaces only
 - Mulch using composted leaf mulch
 - Apply micro irrigation to TPZ remaining connected to a designated water source
 - Tree protection fencing required

10.1.6. Tree No. 80 *Eucalyptus saligna* (Sydney Blue Gum) is a dominant and mature indigenous tree located onsite. It is in fair condition with a 'TreeAZ' rating of 'A2', a 40+yrs life expectancy and high in significance. The existing tennis court proposed for demolition encroaches the 9.6m TPZ by a major 22%.

- Recommendations
 - Demolition machinery to work from hard surfaces only
 - Mulch using composted leaf mulch
 - Apply micro irrigation to TPZ remaining connected to a designated water source
 - Tree protection fencing required

10.1.7. Tree No. 81 *Eucalyptus saligna* (Sydney Blue Gum) is a dominant and semi mature indigenous tree located onsite. It is in fair condition with a 'TreeAZ' rating of 'A2', a 40+yrs life expectancy and high in significance. The existing tennis court proposed for demolition encroaches the 4.8m TPZ by a minor 1%.

- Recommendations
 - Demolition machinery to work from hard surfaces only
 - Tree protection fencing required

11. Tree Protection and Management Programme

11.1. Tree Retention & Removal List

Protected trees only

Tree No.	Species	TPZ (m)	Status
34	Juniperus communis (Juniper)	2.4m	Retain
35	Juniperus communis (Juniper)	2.0m	Retain
37	Camellia reticulata (Reticulata Camellia)	2.4m	Retain
42	Juniperus communis (Juniper)	2.0m	Retain
43	Camellia reticulata (Reticulata Camellia)	2.0m	Retain
45	Cupressus sempervirens var. stricta (Pencil Pine)	2.4m	Retain
46	Cupressus sempervirens var. stricta (Pencil Pine)	2.4m	Retain
47	Podocarpus elatus (Brown Pine)	7.2m	Retain
48	Eucalyptus microcorys (Tallowwood)	8.4m	Retain
49	Glochidion ferdinandi (Cheese Tree)	6.0m	Retain
50	Grevillea robusta (Silky Oak)	2.4m	Retain
51	Callistemon salignus (Willow Bottlebrush)	4.2m	Retain
52	Callistemon salignus (Willow Bottlebrush)	2.0m	Retain
53	Callistemon salignus (Willow Bottlebrush)	3.0m	Retain
54	Thuja plicata (Western Red Cedar)	4.8m	Retain
55	Glochidion ferdinandi (Cheese Tree)	6.0m	Retain
56	Archontophoenix cunninghamiana (Bangalow Palm) multiple	3.6m	Retain
57	Archontophoenix cunninghamiana (Bangalow Palm)	3.6m	Retain
58	Archontophoenix cunninghamiana (Bangalow Palm)	2.4m	Retain
59	Jacaranda mimosifolia (Jacaranda)	4.8m	Retain
60	Jacaranda mimosifolia (Jacaranda)	5.1m	Retain
61	Camellia reticulata (Reticulata Camellia)	2.4m	Retain
62	Livistona chinensis (Chinese Fan Palm)	6.0m	Retain
63	Cedrus deodara (Deodar Cedar)	6.0m	Retain
64	Jacaranda mimosifolia (Jacaranda)	6.0m	Retain
65	Eucalyptus saligna (Sydney Blue Gum)	12.0m	Retain
66	Stenocarpus sinuatus (Fire Wheel Tree)	2.4m	Retain
68	Eucalyptus saligna (Sydney Blue Gum)	6.0m	Retain
69	Eucalyptus saligna (Sydney Blue Gum)	7.2m	Retain
70	Eucalyptus pilularis (Blackbutt)	4.8m	Retain
71	Angophora costata (Smooth-barked Apple)	6.6m	Retain
72	Syncarpia glomulifera (Turpentine)	4.8m	Retain
73	Syncarpia glomulifera (Turpentine)	6.0m	Retain
74	Pittosporum undulatum (Sweet Pittosporum)	4.8m	Retain
75	Brachychiton acerifolius (Illawarra Flame Tree)	4.8m	Retain
76	Grevillea robusta (Silky Oak)	24.0m	Retain
78	Callistemon salignus (Willow Bottlebrush)	5.1m	Retain
79	Pittosporum undulatum (Sweet Pittosporum)	2.4m	Retain
80	Eucalyptus saligna (Sydney Blue Gum)	9.6m	Retain
81	Eucalyptus saligna (Sydney Blue Gum)	4.8m	Retain
83	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
84	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
85	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
86	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
87	Eucalyptus punctata (Grey Gum)	8.4m	Retain
88	Cedrus deodara (Deodar Cedar)	8.4m	Retain
89	Ulmus glabra (Scotch Elm)	7.2m	Retain
90	Archontophoenix cunninghamiana (Bangalow Palm)	3.6m	Retain

Table 10. Tree Retention and Removal List

Tree Retention and Removal List Continued

Tree No.	Species	TPZ (m)	Status
91	Archontophoenix cunninghamiana (Bangalow Palm)	3.6m	Retain
92	Archontophoenix cunninghamiana (Bangalow Palm)	2.4m	Retain
93	Archontophoenix cunninghamiana (Bangalow Palm)	2.4m	Retain
94	Archontophoenix cunninghamiana (Bangalow Palm)	2.4m	Retain
95	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
96	Howea forsteriana (Kentia Palm)	2.0m	Retain
97	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
98	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
99	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
100	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
101	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain
102	Ravenea rivularis (Majesty Palm)	2.4m	Retain
105	Syncarpia glomulifera (Turpentine)	3.6m	Retain

Table 10. Continued -Tree Retention and Removal List

11.2. Tree Protection Measures

These specifications are for the trees identified and selected for retention including any tree located on adjoining properties.

- 11.2.1. **Tree Protection** - All tree parts must be protected - This includes roots, trunks and branches. *The TPZ distance is measured radially from the trunk.*
- 11.2.2. **Fencing** - A 1.8m chain wire fence, secured and fastened to prevent movement be installed in accordance with *AS4970-2009 protection of trees on development sites* and *AS 4687-2007 Temporary Fencing and Hoarding*. The TPZ distances are located within the tree schedule. Woody roots must not be damage during fencing TPZ fencing installation. The installation of all required tree protection fencing must include shade cloth attached to the fencing to reduce transport of dust, particulates and liquids from entering the tree protection zone. No fence relocation is permitted without Arborist permission.
- 11.2.3. **Ground Protection** - Ground surface protection must be installed if construction access is required through any TPZ. Protected with boarding (ie scaffolding board or plywood sheeting or similar material), placed over a layer of mulch to a depth of at least 100mm and geotextile fabric. The protective boarding must be left in place for the duration of the construction and development. The existing concrete driveways are to be left in-situ and forms part of the ground surface protection.
- 11.2.4. **Signage** - “Tree Protection Zone, No Entry”. With project arborist contact details to be attached to the protective fencing.
- 11.2.5. **Machinery Movements** - Machinery movements must be kept outside of TPZ's or on hard surfaces within TPZ's.

11.2.6. **AS4970-2009** - Activities generally excluded from the TPZ include but are not limited to;

- soil cutting or fill including trenching
- machine excavation including trenching;
- excavation for silt fencing;
- soil cultivation, disturbance or compaction;
- stockpiling, storage or mixing of materials;
- preparation of chemicals, including preparation of cement products;
- parking of vehicles and plant;
- disposal of liquids and refuelling;
- dumping of waste;
- disposal of building materials;
- was placement of fill;
- lighting of fires;
- soil level changes;
- temporary or permanent installation of utilities and signs, and
- physical damage to the tree.
- site offices or shed locations

11.2.7. **Canopy Pruning** - No pruning is expected.

11.2.8. **Mulch** - Within the TPZ fencing up to 100mm of *COMPOSTED* organic mulch must be applied to help retain moisture levels, suppress weed growth and reduce tree stress. Mulch must be in accordance with AS4454-2012 Composts, soil conditioners and mulches.

11.2.9. **Irrigation** - All trees must be thoroughly watered regularly throughout the development process. This is dependent on weather conditions where more water applied during hot and or winding weather. Micro-irrigation lines must be connected to a designated water source that remains connected throughout the development works. and forward-facing sprayers from the fence line for use during and post construction activities.

11.2.10. **Tree Damage** - If any tree is damaged the project arborist should be notified, engaged to inspect and provide advice as well as written documentation to be supplied to the certifying authority.

11.2.11. **Fertilisation** - Any tree requiring fertilisation should be performed at the discretion of the site arborist only.

11.3. Tree Monitoring Schedule

11.3.1. During site occupation all TPZ's and trees must be monitored, assessed and recorded by the project arborist according to council's determinations.

11.3.2. Any work that occurs within a TPZ must be witnessed and directed by the project arborist.

11.3.3. In the event that any tree is declining in health the project arborist shall be engaged to supply written remedial applications that must be applied immediately.

11.3.4. Any excavation work within a Tree Protection Zone must be monitored by the project arborist.

11.4. Project Arborist Monitoring

1	Project arborist (level 5) must oversee tree retention with written confirmation from the owner or site manager
2	All tree related matters must be discussed with the project arborist
3	The builder / site manager is responsible to inform the project arborist of any issues during works
4	Project arborist must maintain a <u>monthly</u> log including site visits, notes and photographs
5	Project arborist must provide feedback the builder, site manager or council

Table 11. Project Arborist Monitoring

11.5. Project Arborist Supervision

An Arborist with minimum qualifications in Arboriculture of Level 5 (under the Australian Qualification Framework) must oversee various stages of work within the Tree Protection Zone of any tree listed for retention. The Arborist must certify compliance with each key milestone as detailed below.

1	Project arborist to mark or tag all trees to be removed (red) and retain (green) with confirmed and agreement with site manager prior to ANY onsite works
2	Project arborist to mark tree protection fencing locations prior to ANY onsite works
3	During demolition of any ground surface materials (paving, concrete, grass etc) within the Tree Protection Zone (TPZ) of any tree to be retained
4	During any excavation and trenching which has been approved by Council within the TPZ of any tree to be retained
5	During any Landscape works within the TPZ of any tree to be retained


Table 12. Project Arborist Supervision


11.6. Project Arborist Hold Points

Hold Point	Task	Timing
1	Tree Protection Plan be onsite prior to works (AS4970-2009)	Prior to demolition of any structures
2	Approve tree tagging for tree retention and removal	
4	Inspect Tree Protection Fencing with signage (AS4970-2009)	
5	Install Trunk Protection where applicable	As required prior to works proceeding
6	Supervise all work within any TPZ's	As required during works
7	Tree Inspection	Monthly during all construction works
8	Final Tree Inspection	Post construction

Table 13. Project Arborist Hold Points

11.7. Tree Protection Plan





Tree Protection Plan

AS 4970-2009 Protection of trees on development sites

Site Address:
77 Kulgoa Road, Pymble

Client:
Mr & Mrs Leece

Date:
11 July 2024


Reference:
20242078.5

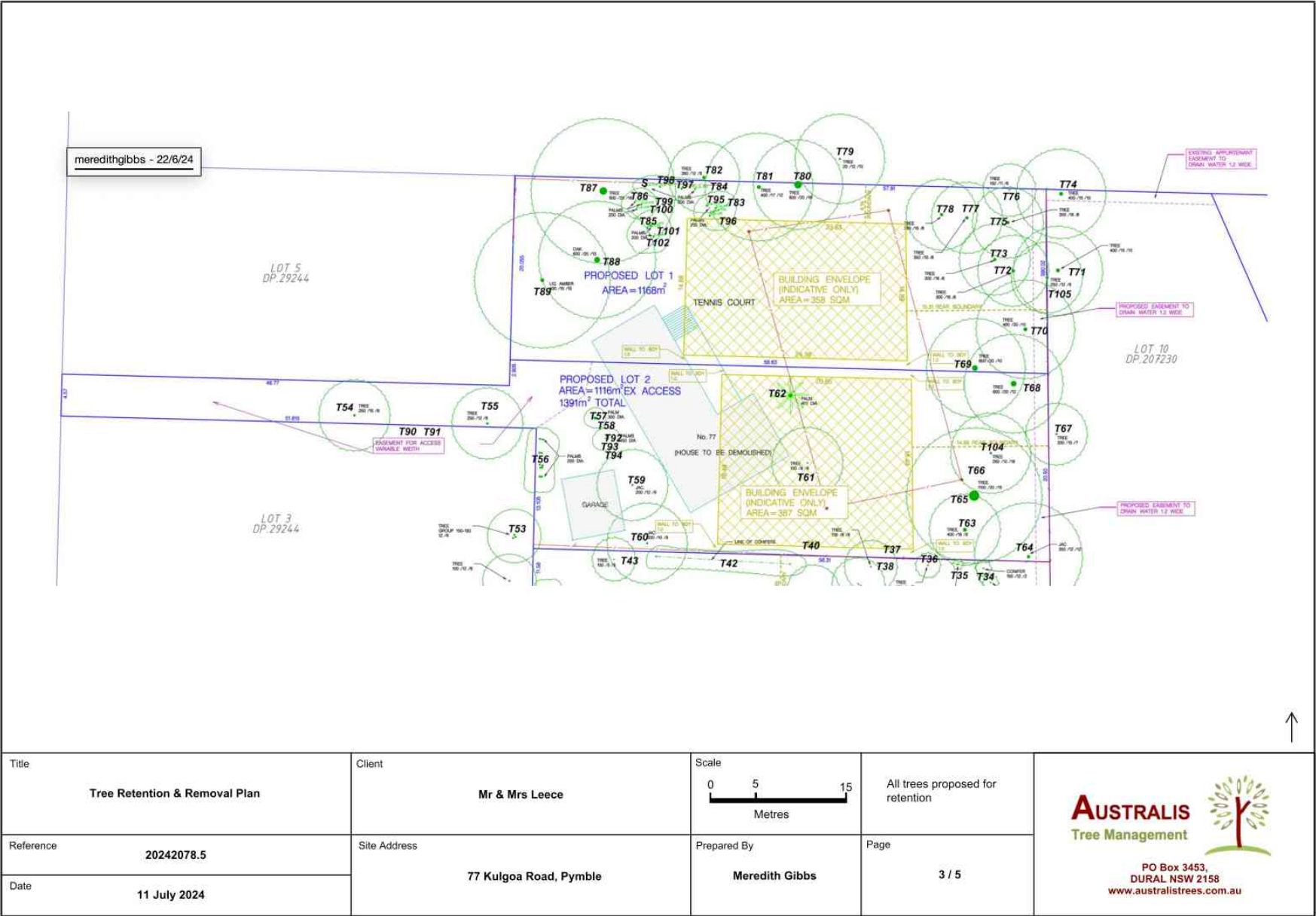
Prepared By:
Meredith Gibbs

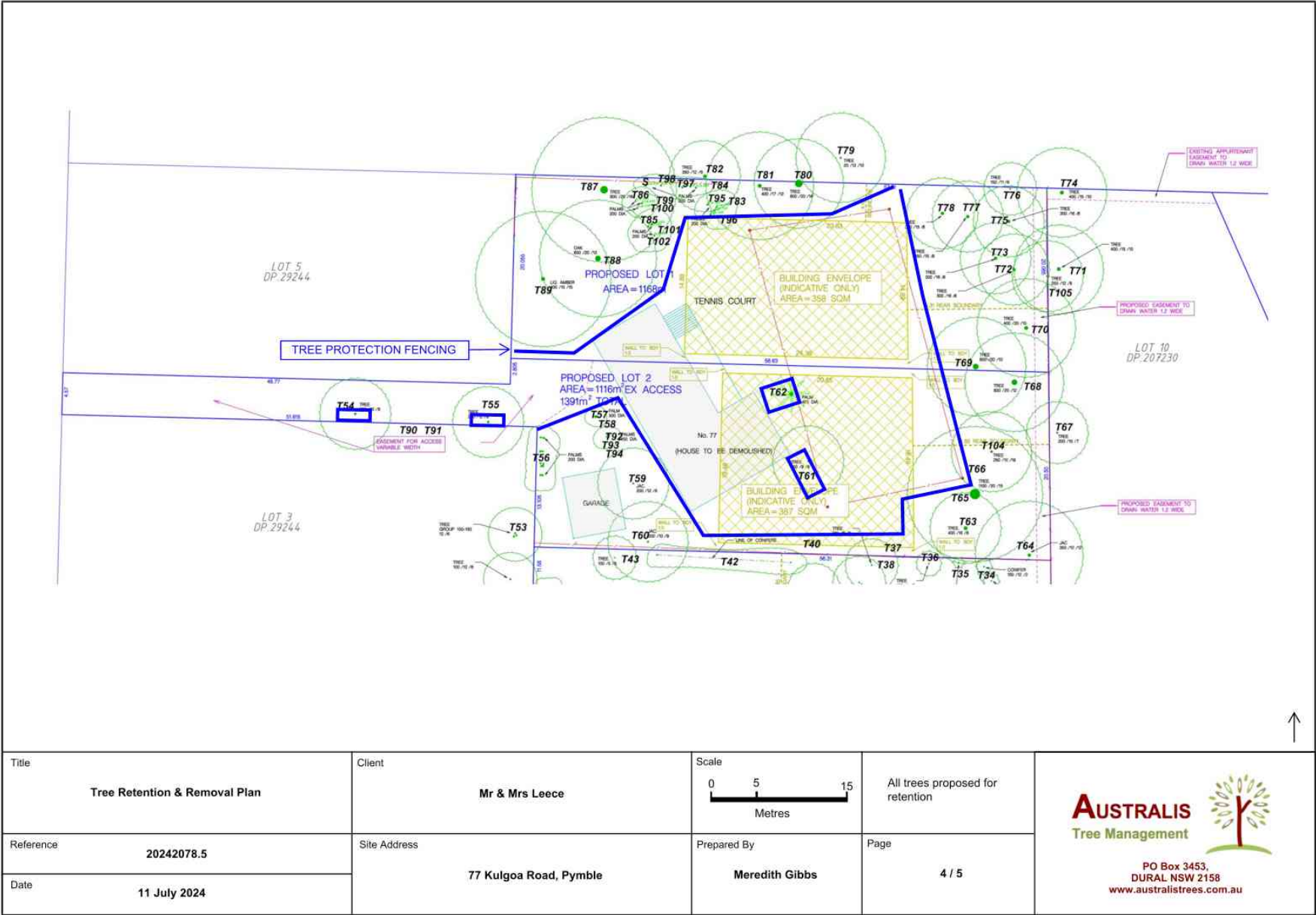
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www.australistrees.com.au

Tree No.	Species	TPZ	Proposed Status	Tree No.	Species	TPZ	Proposed Status	Tree No.	Species	TPZ	Proposed Status
34	Juniperus communis (Juniper)	2.4m	Retain	73	Syncarpia glomulifera (Turpentine)	6.0m	Retain	103	Camellia reticulata (Reticulata Camellia)*	2.0m	Retain
35	Juniperus communis (Juniper)	2.0m	Retain	74	Pittosporum undulatum (Sweet Pittosporum)	4.8m	Retain	104	Celtis australis (Nettle Tree)*	6.0m	Retain
36	Buxus sp (Buxus)*	2.0m	Retain	75	Brachychiton acerifolius (Illawarra Flame Tree)	4.8m	Retain	105	Syncarpia glomulifera (Turpentine)	3.6m	Retain
37	Camellia reticulata (Reticulata Camellia)	2.4m	Retain	76	Grevillea robusta (Silky Oak)	24.0m	Retain	106	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)*	2.0m	Retain
38	Pittosporum tenuifolium (Pittosporum)*	2.0m	Retain	77	Celtis australis (Nettle Tree)*	7.2m	Retain	107	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)*	2.0m	Retain
40	Celtis australis (Nettle Tree)*	2.0m	Retain	78	Callistemon salignus (Willow Bottlebrush)	5.1m	Retain	108	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)*	2.0m	Retain
42	Juniperus communis (Juniper)	2.0m	Retain	79	Pittosporum undulatum (Sweet Pittosporum)	2.4m	Retain	109	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)*	2.0m	Retain
43	Camellia reticulata (Reticulata Camellia)	2.0m	Retain	80	Eucalyptus saligna (Sydney Blue Gum)	9.6m	Retain	110	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)*	2.0m	Retain
49	Glochidion ferdinandi (Cheese Tree)	6.0m	Retain	81	Eucalyptus saligna (Sydney Blue Gum)	4.8m	Retain				
53	Callistemon salignus (Willow Bottlebrush)	3.0m	Retain	82	Ligustrum lucidum (Large Leaf Privet)*	3.6*	Retain				
54	Thuja plicata (Western Red Cedar)	4.8m	Retain	83	Livistona chinensis (Chinese Fan Palm)	3.0m	Retain				
55	Glochidion ferdinandi (Cheese Tree)	6.0m	Retain	84	Livistona chinensis (Chinese Fan Palm)	3.0m	Retain				
56	Archontophoenix cunninghamiana (Bangalow Palm) multiple	3.0m	Retain	85	Livistona chinensis (Chinese Fan Palm)	3.0m	Retain				
57	Archontophoenix cunninghamiana (Bangalow Palm)	3.0m	Retain	86	Livistona chinensis (Chinese Fan Palm)	3.0m	Retain				
58	Archontophoenix cunninghamiana (Bangalow Palm)	3.0m	Retain	87	Eucalyptus punctata (Grey Gum)	8.4m	Retain				
59	Jacaranda mimosifolia (Jacaranda)	4.8m	Retain	88	Cedrus deodara (Deodar Cedar)	8.4m	Retain				
59	Jacaranda mimosifolia (Jacaranda)	4.8m	Retain	89	Ulmus glabra (Scotch Elm)	7.2m	Retain				
60	Jacaranda mimosifolia (Jacaranda)	5.1m	Retain	90	Archontophoenix cunninghamiana (Bangalow Palm)	3.0m	Retain				
61	Camellia reticulata (Reticulata Camellia)	2.4m	Retain	91	Archontophoenix cunninghamiana (Bangalow Palm)	3.0m	Retain				
62	Livistona chinensis (Chinese Fan Palm)	3.0m	Retain	92	Archontophoenix cunninghamiana (Bangalow Palm)	3.0m	Retain				
63	Cedrus deodara (Deodar Cedar)	6.0m	Retain	93	Archontophoenix cunninghamiana (Bangalow Palm)	3.0m	Retain				
64	Jacaranda mimosifolia (Jacaranda)	6.0m	Retain	94	Archontophoenix cunninghamiana (Bangalow Palm)	2.4m	Retain				
65	Eucalyptus saligna (Sydney Blue Gum)	12.0m	Retain	95	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain				
66	Stenocarpus sinuatus (Fire Wheel Tree)	2.4m	Retain	96	Howea forsteriana (Kentia Palm)	2.0m	Retain				
67	Dead	N/A	Retain	97	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain				
68	Eucalyptus saligna (Sydney Blue Gum)	6.0m	Retain	98	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain				
69	Eucalyptus saligna (Sydney Blue Gum)	7.2m	Retain	99	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain				
70	Eucalyptus pilularis (Blackbutt)	4.8m	Retain	100	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain				
71	Angophora costata (Smooth-barked Apple)	6.6m	Retain	101	Livistona chinensis (Chinese Fan Palm)	2.4m	Retain				
72	Syncarpia glomulifera (Turpentine)	4.8m	Retain	102	Ravenea rivularis (Majesty Palm)	2.4m	Retain				

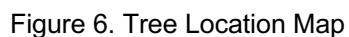
* Exempt from Council Protection

Title	Client		Retain Remove	 <p>PO Box 3453, DURAL NSW 2158 www.australistrees.com.au</p>
Reference	Site Address	Prepared By	Page	
Date				
Tree List	Mr & Mrs Leece			
20242078.5	77 Kulgoa Road, Pymble	Meredith Gibbs	2 / 5	
11 July 2024				





<p>Project Arborist Monitoring</p> <p>Project arborist (level 5) must oversee tree retention with written confirmation from the owner or site manager</p> <p>All tree related matters must be discussed with the project arborist</p> <p>The builder / site manager is responsible to inform the project arborist of any issues during works</p> <p>Project arborist must maintain a monthly log including site visits, notes and photographs</p> <p>The project arborist must provide feedback to the owner / builder / notes and site manager / council.</p> <p>All tree related matters must be discussed with the project arborist</p> <p>Project Hold Points</p> <p>Prior to demolition of structures Tree Protection Plan & Specifications must be onsite prior to works</p> <p>Project arborist must oversee tree retention</p> <p>Project arborist must inspect Tree Protection Fencing including adequate signage</p> <p><u>As required</u></p> <p>The builder / site manager is responsible to inform the project arborist of any issues during works</p> <p><u>During all construction works</u> Project arborist must inspect trees monthly</p> <p><u>Post construction</u> Final Tree Inspection</p>	<p>Activities Excluded From Tree Protection Zones</p> <p>No soil level changes Machine excavation including trenching Excavation for silt fencing Cultivation Preparation of chemicals Parking of vehicles and machinery Refuelling Dumping of waste Wash down and cleaning of equipment Placement of fill Lighting of fires Temporary or permanent installation of utilities Physical damage to the tree Bolt cutters or wire cutters must not be used for root pruning</p> <p>Activities Permissible Within Tree Protection Zones</p> <p>Any excavation work within a Tree Protection Zone must be monitored by the project arborist.</p> <p>Roots measuring over 50mm in diameter within the Tree Protection Zone and outside the Structural Root Zone may be pruned at the discretion of the project arborist.</p> <p>Root exposure must be applied with hand tools or Air Spade to prevent damage to the root system.</p> <p>All root pruning equipment must be sharp and clean. Secateurs, loppers or pruning saws should be used and can be cleaned with methylated spirits to prevent disease and pathogen spread. No bolt cutters.</p> <p>Any roots exposed must be wrapped or covered with hessian or cloth and kept moist to prevent drying out and sunburn until backfilling occurs.</p> <p>Backfill must be watered in and mulched with composted leaf mulch.</p>	<p>Tree Protection Fencing</p> <p>A 1.8m chain wire fence, secured and fastened to prevent movement be installed in accordance with AS4970-2009 and AS 4687-2007. Woody roots must not be damaged during TPZ fencing installation. No fence relocation is permitted without Arborist permission.</p> <p>Signage - "Tree Protection Zone, No Entry". With project arborist contact details to be attached to the protective fencing.</p> <p>Within the TPZ fencing up to 50mm of COMPOSTED organic mulch must be applied to help retain moisture levels, suppress weed growth and reduce tree stress. Mulch must be in accordance with AS4454-2012 Composts, soil conditioners and mulches.</p> <p>All trees must be thoroughly watered regularly throughout the development works. This is dependent on weather conditions where more water applied during hot and or winding weather.</p> <p>Tree protection fencing must include shade cloth attached to the fencing to reduce transport of dust, particulates and liquids from entering the TPZ.</p> <p>Trunk Protection</p> <p>Trunk protection shall consist of hessian wrapped around the trunk.</p> <p>Two metre lengths of timber (100 x 50mm) spaced at 100-150mm centres secured together with 2mm galvanised wire.</p> <p>These shall be strapped around the trunk and not fixed to the tree in any way to avoid mechanical injury or damage.</p> <p>Ground Protection</p> <p>Ground protection is required within a TPZ for foot traffic, temporary access for machinery and if full TPZ fencing distances cannot be achieved.</p> <p>The purpose of ground protection is to prevent root damage and soil compaction within the TPZ.</p> <p>Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.</p> <p>These measures may be applied to root zones beyond the TPZ.</p> <p>Foot Traffic Platforms</p> <p>Ground protection against foot traffic is required within the TPZ. Scaffolding with timber boards attached</p>		
<p>Compliance Inspection Check List</p> <p>Council Conditions and the following list will be checked during each inspection. Failure will result in non compliance.</p> <ul style="list-style-type: none"> Tree protection fencing in place Trunk protection in place Ground protection in place Correct signage attached Mulch installed Irrigation installed Scaffolding installation damage Evidence of tree protection fencing adjustments Evidence tree damage Evidence of machinery movements, foot traffic or work within TPZ fencing 				<p>AUSTRALIS Tree Management</p> <p>PO Box 3453, DURAL NSW 2158 www.australistrees.com.au</p>
<p>Title</p> <p>Tree Protection Specifications</p> <p>AS 4970-2009 Protection of trees on development sites</p> <p>Reference</p> <p>20242078.5</p> <p>Date</p> <p>11 July 2024</p>	<p>Client</p> <p>Mr & Mrs Leece</p> <p>Site Address</p> <p>77 Kulgoa Road, Pymble</p>	<p>Prepared By</p> <p>Meredith Gibbs</p>	<p>Page</p> <p>5 / 5</p>	



Appendix B - Tree Schedule

Tree No.	Species	Location	DBH (cm) multi (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
34	Juniperus communis (Juniper)	adjoining 73 Kulgoa Road	20	20	6.0	1.0 1.0 1.0 1.0 N S E W	mature	15-40yrs	codominant	fair	good (4)	fair	N/A N/A	exotic	Z1	Yes	2.4 1.7	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
35	Juniperus communis (Juniper)	adjoining 73 Kulgoa Road	15	15	6.0	0.5 0.5 0.5 1.0 N S E W	mature	15-40yrs	codominant	fair	good (4)	fair	N/A N/A	exotic	Z1	Yes	2.0 1.5	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
36	Buxus sp (Buxus)	adjoining 73 Kulgoa Road	10	20	3.0	2.0 2.0 2.0 2.0 N S E W	mature	15-40yrs	dominant	fair	good (4)	fair	N/A N/A	exotic	Z1	No	2.0 1.7	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
37	Camellia reticulata (Reticulata Camellia)	onsite	20 10 10 10 10	50	5.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	fair	good (4)	fair	0% <10%	exotic	Z1	Yes	2.4 2.5	indicative building envelope (lot 3)	0.0	100%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
38	Pittosporum tenuifolium (Pittosporum)	adjoining 73 Kulgoa Road	10	20	4.0	2.0 2.0 2.0 2.0 N S E W	mature	15-40yrs	dominant	fair	good (4)	fair	N/A N/A	exotic	Z1	No	2.0 1.7	no works		0%	Retain
Health & Condition lean																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
40	Celtis australis (Nettle Tree)	adjoining 73 Kulgoa Road	10	10	5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	fair	average (3)	fair	0% <10%	exotic	Z3	No	2.0 1.5	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
42	Juniperus communis (Juniper)	adjoining 73 Kulgoa Road	5	5	3.0	1.0 1.0 1.0 1.0 N S E W	mature	15-40yrs	codominant	fair	good (4)	fair	N/A N/A	exotic	Z1	Yes	2.0 1.5	indicative building envelope (lot 3)	1.5	7%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
43	Camellia reticulata (Reticulata Camellia)	adjoining 73 Kulgoa Road	5	10	5.0	1.0 1.0 1.0 1.0 N S E W	mature	40+yrs	dominant	fair	average (3)	fair	0% <10%	exotic	Z1	Yes	2.0 1.5	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
49	Glochidion ferdinandi (Cheese Tree)	adjoining 75 Kulgoa Road	50 25 25 25 25	60	12.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	codominant	fair	average (3)	fair	<10% <10%	native	A2	Yes	6.0 2.7	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
53	Callistemon salignus (Willow Bottlebrush)	adjoining 75 Kulgoa Road	25	30	10.0	3.0 3.0 3.0 3.0 N S E W	mature	5-15yrs	dominant	poor	decline (2)	fair	50%-75% <10%	native	Z4	Yes	3.0 2.0	no works		0%	Retain
Health & Condition decline / stress																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					

Tree No.	Species	Location	DBH (cm) multi (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
54	Thuja plicata (Western Red Cedar)	onsite	40	40	12.0	3.0 3.0 2.5 3.0 N S E W	mature	15-40yrs	dominant	fair	average (3)	poor	<10% N/A	exotic	A2	Yes	4.8 2.3	no works		0%	Retain
			Health & Condition included bark in scaffold union at 2m																		
			Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																		
55	Glochidion ferdinandi (Cheese Tree)	onsite	50	50	10.0	3.5 3.5 3.5 3.5 N S E W	mature	40+yrs	codominant	fair	average (3)	fair	<10% <10%	native	A2	Yes	6.0 2.5	no works		0%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																		
56	Archontophoenix cunninghamiana (Bangalow Palm) multiple	onsite	30		8.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	3.6	no works		0%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																		
57	Archontophoenix cunninghamiana (Bangalow Palm)	onsite	30		8.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	3.6	no works		0%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																		
58	Archontophoenix cunninghamiana (Bangalow Palm)	onsite	20		8.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	2.4	no works		0%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																		
59	Jacaranda mimosifolia (Jacaranda)	onsite	40	50	6.0	4.0 3.5 3.5 4.5 N S E W	young	40+yrs	dominant	fair	average (3)	fair	<10% <10%	exotic	A2	Yes	4.8 2.5	No. 77 dwelling demolition	3.6	7%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure No. 77 dwelling demolition Existing Structure Distance 4m Existing Structure Obstruction % 7%																		
60	Jacaranda mimosifolia (Jacaranda)	onsite	42 30 30	50	7.0	3.0 3.0 3.0 3.0 N S E W	young	40+yrs	dominant	fair	average (3)	fair	<10% <10%	exotic	A2	Yes	5.1 2.5	no works		0%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																		
61	Camellia reticulata (Reticulata Camellia)	onsite	20 10 10 10 10	50	5.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	fair	good (4)	fair	0% <10%	exotic	Z1	Yes	2.4 2.5	indicative building envelope (lot 2)	0.0	100%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure No. 77 dwelling demolition Existing Structure Distance 2m Existing Structure Obstruction % 6%																		
62	Livistona chinensis (Chinese Fan Palm)	onsite	50		8.0	2.0 2.0 2.0 2.0 N S E W	semi mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	6.0	indicative building envelope (lot 2)	0.0	0%	Retain
			Health & Condition no significant issues sighted																		
			Existing Structure No. 77 dwelling demolition Existing Structure Distance 3m Existing Structure Obstruction % 20%																		
63	Cedrus deodara (Deodar Cedar)	onsite	50	55	10.0	3.0 3.0 3.0 3.0 N S E W	semi mature	15-40yrs	suppressed	fair	low (2-3)	poor	<10% N/A	exotic	Z10	Yes	6.0 2.6	indicative building envelope (lot 2)	5.0	4%	Retain
			Health & Condition poor form																		
			Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																		

Tree No.	Species	Location	DBH (cm) multi (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encr	Proposed Status
64	Jacaranda mimosifolia (Jacaranda)	onsite	50 30 40	50	9.0	4.0 6.0 3.0 3.0 N S E W	semi mature	40+yrs	dominant	fair	average (3)	poor	<10% <10%	exotic	Z5	Yes	6.0 2.5	no works		0%	Retain
Health & Condition lean																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
65	Eucalyptus saligna (Sydney Blue Gum)	onsite	100	100	20.0	7.0 7.0 7.0 8.0 N S E W	mature	40+yrs	codominant	fair	average (3)	fair	10%-25% 10%-25%	indigenous	A2	Yes	12.0 3.3	indicative building envelope (lot 2)	5.8	6%	Retain
Health & Condition minor previously failed branches, one with bracket fungi / deadwood / 5-10cm diameter trunk cavities																					
Existing Structure tennis court Existing Structure Distance 2m Existing Structure Obstruction % 19%																					
66	Stenocarpus sinuatus (Fire Wheel Tree)	onsite	20	20	8.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	fair	<10% <10%	native	Z1	Yes	2.4 1.7	no works		0%	Retain
Health & Condition basal suckers																					
Existing Structure tennis court Existing Structure Distance 1m Existing Structure Obstruction % 6%																					
67	Dead	adjoining 18 Bristol Ave				N S E W		dead (no hollows)			dead				Z4						
Health & Condition																					
Existing Structure Existing Structure Distance Existing Structure Obstruction %																					
68	Eucalyptus saligna (Sydney Blue Gum)	onsite	50	60	17.0	7.0 7.0 6.0 6.0 N S E W	mature	40+yrs	codominant	fair	average (3)	fair	<10% <10%	indigenous	A2	Yes	6.0 2.7	no works		0%	Retain
Health & Condition minor previously failed branches																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
69	Eucalyptus saligna (Sydney Blue Gum)	onsite	60	65	20.0	7.0 7.0 6.0 6.0 N S E W	mature	40+yrs	codominant	fair	average (3)	fair	<10% <10%	indigenous	A2	Yes	7.2 2.8	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure tennis court Existing Structure Distance 4m Existing Structure Obstruction % 17%																					
70	Eucalyptus pilularis (Blackbutt)	onsite	40	50	18.0	3.0 3.0 4.0 4.0 N S E W	semi mature	40+yrs	codominant	fair	average (3)	fair	<10% 25%-50%	indigenous	A2	Yes	4.8 2.5	no works		0%	Retain
Health & Condition stress																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
71	Angophora costata (Smooth-barked Apple)	adjoining 18 Bristol Ave	55	60	20.0	5.0 5.0 5.0 5.0 N S E W	semi mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	indigenous	A2	Yes	6.6 2.7	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
72	Syncarpia glomulifera (Turpentine)	onsite	40	50	16.0	4.0 4.0 4.0 4.0 N S E W	young	40+yrs	intermediate	fair	average (3)	fair	<10% N/A	indigenous	A2	Yes	4.8 2.5	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
73	Syncarpia glomulifera (Turpentine)	onsite	50	60	18.0	5.0 5.0 5.0 5.0 N S E W	semi mature	40+yrs	intermediate	fair	average (3)	fair	<10% N/A	indigenous	A2	Yes	6.0 2.7	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					

Tree No.	Species	Location	DBH (cm) <i>(multi (cm))</i>	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encr	Proposed Status
74	Pittosporum undulatum (Sweet Pittosporum)	adjoining 18 Bristol Ave	40	40	10.0	5.0 5.0 5.0 5.0 N S E W	mature	5-15yrs	codominant	fair	average (3)	fair	<10% N/A	indigenous	A2	Yes	4.8 2.3	no works		0%	Retain
Health & Condition climber																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
75	Brachychiton acerifolius (Illawarra Flame Tree)	onsite	40	45	15.0	5.0 5.0 5.0 5.0 N S E W	semi mature	40+yrs	codominant	good	average (3)	good	<10% <10%	native	A2	Yes	4.8 2.4	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
76	Grevillea robusta (Silky Oak)	onsite	200	250	11.0	3.0 3.0 3.0 3.0 N S E W	young	15-40yrs	codominant	fair	average (3)	fair	<10% N/A	native	A2	Yes	24.0 4.9	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
77	Celtis australis (Nettle Tree)	onsite	60	60	8.0	3.0 6.0 3.0 3.0 N S E W	mature	15-40yrs	codominant	poor	average (3)	poor	<10% <10%	exotic	Z5	No	7.2 2.7	indicative building envelope (lot 1)	6.0	2%	Retain
Health & Condition trunk wound																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
78	Callistemon salignus (Willow Bottlebrush)	onsite	42 30 30	50	13.0	4.0 4.0 4.0 4.0 N S E W	mature	15-40yrs	codominant	fair	average (3)	poor	<10% <10%	native	Z5	Yes	5.1 2.5	indicative building envelope (lot 1)	3.5	5%	Retain
Health & Condition included bark within codominant stems (burfucating at 1m) and scaffold unions																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
79	Pittosporum undulatum (Sweet Pittosporum)	adjoining SP2 Water Supply	20	30	8.0	3.0 3.0 3.0 3.0 N S E W	mature	15-40yrs	dominant	fair	good (4)	fair	<10% <10%	indigenous	Z1	Yes	2.4 2.0	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
80	Eucalyptus saligna (Sydney Blue Gum)	onsite	80	90	20.0	5.0 5.0 5.0 5.0 N S E W	mature	40+yrs	dominant	fair	average (3)	fair	10%-25% 10%-25%	indigenous	A2	Yes	9.6 3.2	indicative building envelope (lot 1)	3.4	3%	Retain
Health & Condition no significant issues sighted																					
Existing Structure tennis court Existing Structure Distance 4m Existing Structure Obstruction % 22%																					
81	Eucalyptus saligna (Sydney Blue Gum)	onsite	40	50	16.0	5.0 4.0 2.0 7.0 N S E W	semi mature	40+yrs	dominant	fair	average (3)	fair	10%-25% 10%-25%	indigenous	A2	Yes	4.8 2.5	indicative building envelope (lot 1)	3.0	7%	Retain
Health & Condition no significant issues sighted																					
Existing Structure tennis court Existing Structure Distance 4m Existing Structure Obstruction % 1%																					
82	Ligustrum lucidum (Large Leaf Privet)	adjoining SP2 Water Supply	30	40	12.0	3.0 3.0 3.0 3.0 N S E W	mature	40+yrs	dominant	fair	average (3)	fair	N/A N/A	exotic	Z3	No	3.6 2.3	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
83	Livistona chinensis (Chinese Fan Palm)	onsite	20		6.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	indicative building envelope (lot 1)	1.0	0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					

Tree No.	Species	Location	DBH (cm) multi (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Ener	Proposed Status
84	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
85	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
86	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
87	Eucalyptus punctata (Grey Gum)	onsite	70	75	16.0	8.5 6.5 9.0 7.0 N S E W	mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	indigenous	A2	Yes	8.4 2.9	no works		0%	Retain
Health & Condition no significant issues sighted / minor deadwood																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
88	Cedrus deodara (Deodar Cedar)	onsite	70	80	16.0	5.0 5.0 4.0 5.0 N S E W	mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	exotic	A2	Yes	8.4 3.0	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
89	Ulmus glabra (Scotch Elm)	onsite	60	50	16.0	5.0 5.0 3.0 6.0 N S E W	mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	exotic	A2	Yes	7.2 2.5	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
90	Archontophoenix cunninghamiana (Bangalow Palm)	adjoining 75 Kulgoa Road	30		10.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	3.6	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
91	Archontophoenix cunninghamiana (Bangalow Palm)	adjoining 75 Kulgoa Road	30		10.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	3.6	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
92	Archontophoenix cunninghamiana (Bangalow Palm)	onsite	20		8.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	2.4	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
93	Archontophoenix cunninghamiana (Bangalow Palm)	onsite	20		8.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	2.4	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					

Tree No.	Species	Location	DBH (cm) multi (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encr	Proposed Status
94	Archontophoenix cunninghamiana (Bangalow Palm)	onsite	20		8.0	2.0 2.0 2.0 2.0 N S E W	mature	40+yrs	dominant	good	good (4)	good	0% N/A	native	A2	Yes	2.4	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
95	Livistona chinensis (Chinese Fan Palm)	onsite	20		6.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	indicative building envelope (lot 1)	1.0	0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
96	Howea forsteriana (Kentia Palm)	onsite	15		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.0	indicative building envelope (lot 1)	0.5	0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
97	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
98	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
99	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
100	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
101	Livistona chinensis (Chinese Fan Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
102	Ravenea rivularis (Majesty Palm)	onsite	20		5.0	2.0 2.0 2.0 2.0 N S E W	young	40+yrs	dominant	good	good (4)	good	0% N/A	native	Z1	Yes	2.4	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	
103	Camellia reticulata (Reticulata Camellia)	onsite	15 10 5 10	30	3.0	2.0 2.0 2.0 2.0 N S E W	semi mature	40+yrs	dominant	fair	good (4)	fair	0% <10%	exotic	Z1	No	2.0 2.0	no works		0%	Retain
				Health & Condition no significant issues sighted																	
				Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																	

Tree No.	Species	Location	DBH (cm) multi (cm)	DGL (cm)	Height (m)	Canopy (m) radius	Age Class	Life Expectancy	Crown Class	Tree Condition	Crown Condition	Structure Condition	Deadwood Epicormics	Type	Tree AZ	Council Protected	TPZ (m) SRZ (m)	Proposed Works	Distance (m)	Proposed Encl	Proposed Status
104	Celtis australis (Nettle Tree)	onsite	50 30 30	50	8.0	4.0 4.0 4.0 4.0 N S E W	mature	40+yrs	dominant	fair	average (3)	fair	<10% <10%	exotic	Z3	No	6.0 2.5	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure tennis court Existing Structure Distance 4m Existing Structure Obstruction % 13%																					
105	Syncarpia glomulifera (Turpentine)	onsite	30	40	12.0	4.0 4.0 4.0 4.0 N S E W	young	40+yrs	intermediate	fair	average (3)	fair	<10% N/A	indigenous	A2	Yes	3.6 2.3	no works		0%	Retain
Health & Condition no significant issues sighted																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
106	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)	onsite	5	10	4.0	1.0 1.0 1.0 1.0 N S E W	mature	<5yrs	dominant	poor	decline (2)	poor	25%-50% 25%-50%	exotic	Z1	No	2.0 1.5	no works		0%	Retain
Health & Condition decline / stress																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
107	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)	onsite	5	10	4.0	1.0 1.0 1.0 1.0 N S E W	mature	<5yrs	dominant	poor	decline (2)	poor	25%-50% 25%-50%	exotic	Z1	No	2.0 1.5	no works		0%	Retain
Health & Condition decline / stress																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
108	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)	onsite	5	10	3.0	1.0 1.0 1.0 1.0 N S E W	mature	<5yrs	dominant	poor	decline (2)	poor	25%-50% 25%-50%	exotic	Z1	No	2.0 1.5	no works		0%	Retain
Health & Condition decline / stress																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
109	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)	onsite	5	10	4.0	1.0 1.0 1.0 1.0 N S E W	mature	<5yrs	dominant	poor	decline (2)	poor	25%-50% 25%-50%	exotic	Z1	No	2.0 1.5	no works		0%	Retain
Health & Condition decline / stress																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					
110	Tibouchina lepidota 'Alstonville' (Alstonville Tibouchina)	onsite	14 10 10	30	4.0	2.0 2.0 2.0 2.0 N S E W	mature	<5yrs	dominant	poor	decline (2)	poor	25%-50% 25%-50%	exotic	Z1	No	2.0 2.0	no works		0%	Retain
Health & Condition decline / stress																					
Existing Structure N/A Existing Structure Distance Existing Structure Obstruction %																					

Appendix C - Tree Schedule Definitions and Information

Location

- Adjoining Property / Nature Strip / On Site

Dimensions

- Diameter at breast height at 1.4m (DBH) / Diameter at ground level (DGL)

Height

- Height measured in meters determined with a clinometer or estimated by eye

Canopy

- Canopy spread measured in diameter on NearMap or estimated by eye on site

Age Class

- Young - Recently planted or seeded
- Semi mature - < 20% of life expectancy
- Mature - 20% - 80% of life expectancy
- Over mature - > 80% of life expectancy

Life Expectancy

- >5 years / 5-15 years / 15-40 years / 40+ years

Crown Class

- Dominant - Crown extends above general canopy; not restricted by other trees.
- Co-dominant - Crown forms the bulk of the general canopy but crowded by other trees.
- Intermediate - Crown extends into dominant / co dominant canopy but quite crowded on all sides.
- Emergent - Crown development restricted from surrounding trees.
- Suppressed - Crown development restricted from overgrowing trees.

Growth Habit:

- Upright - straight upright narrow canopy
- Leaning – trunk leaning from the root base
- Multi-Stemmed - multiple trunks originating from or near the basal area

Crown Form:

- Symmetrical - even and balanced in all directions
- Asymmetrical - uneven canopy
- Dense - full and dense foliage within the canopy
- Sparse - thin foliage density with open areas in the canopy

Tree Condition

- **Good** - The crown is unrestricted. Free of pests, diseases and obvious structural issues. Has adequate vigour, foliage volume, size and colour.
- **Fair** - The crown is not significantly restricted. Minor signs of pests and diseases. Some signs of damage or branch failures from storms. Some signs of reduced health or potential decline. The tree may improve in health or deteriorate in health and condition and may improve with remedial works.
- **Poor** - The crown is significantly restricted. Major signs of pests and diseases. Significant signs of damage or branch failures where structural integrity may be compromised or the tree is in decline and unlikely to recover.
- **Senescent** - The tree is overmature and show irreversible decline, dying or nearly dead.
- **Dead** - The tree is no longer capable of photosynthesis, osmosis and turgidity. Any dead tree must be assessed for hollow bearing capabilities and habitat potential.

Removed

- No longer present at location.

Crown Condition

- 1 - Severe decline, <20% canopy density; major dead wood
- 2 - Declining, 20-60% canopy density; twig and branch dieback
- 3 - Average / low vigour, 60-90% canopy density; twig dieback
- 4 - Good, 90-100% canopy density; little or no dieback or other problems
- 5 - Excellent, 100% canopy density; no deadwood or other problems

Structural Condition

- Poor - Wounds with fungal fruiting bodies, excessive included bark unions, numerous previous failures, significant wounds.
- Fair - Minor wounds, minor included bark unions, minor deadwood etc.
- Good - No significant issues and good foliage volume

Deadwood

- Low - Less than 10% of the canopy - Small, <10mm diameter and <2 metres in length / Large, >10mm diameter and >2 metres in length
- Medium - Between 10% and 50% of the canopy - Small, <10mm diameter and <2 metres in length / Large, >10mm diameter and >2 metres in length
- High - Greater than 50% of the canopy - Small, <10mm diameter and <2 metres in length / Large, >10mm diameter and >2 metres in length

Epicormic growth

- Low - Less than 10% of the canopy - young / mature
- Medium - Between 10% and 50% of the canopy - young / mature
- High - Greater than 50% of the canopy - young / mature

Leaning Trees

- Low - Angle Less than 15° lean
- Medium - Angle Less than 15°-30° lean
- High - Angle Less than 30°- 45° lean
- Significant - Greater than 45° lean

Tree Type

- Endemic - Species that occur naturally and are restricted to a given area.
- Exotic - An introduced plant from outside Australia.
- Indigenous - Species that occur naturally to a given area but may not be restricted to only that area.
- Native - A general term referring to any plant indigenous to Australia including cultivars.

Root Zone

- Compacted / Garden / Grass / Mulched / Natural Bush / Paved / Soil level lowered / Soil level raised

Structures

- Fence / Garage / Footpath / Verandah / Dwelling / Road / Driveway / Seat

Appendix D - Site Photographs



Figure 7. Tree No.'s 65, 66, 104, 67, 68 and 69

Appendix E - Thumbnail Photographs



34
Juniperus communis
(Juniper)



35
Juniperus communis
(Juniper)



36
Buxus sp (Buxus)



37
Camellia reticulata
(Reticulata Camellia)



38
Pittosporum tenuifolium
(Pittosporum)



40
Celtis australis (Nettle Tree)



42
Juniperus communis
(Juniper)



43
Camellia reticulata
(Reticulata Camellia)



49
Glochidion ferdinandi
(Cheese Tree)



53
Callistemon salignus (Willow
Bottlebrush)



54
Thuja plicata (Western Red
Cedar)



55
Glochidion ferdinandi
(Cheese Tree)



56
Archontophoenix
cunninghamiana (Bangalow
Palm) multiple



57
Archontophoenix
cunninghamiana (Bangalow
Palm)



58
Archontophoenix
cunninghamiana (Bangalow
Palm)



59
Jacaranda mimosifolia
(Jacaranda)



60
Jacaranda mimosifolia
(Jacaranda)



61
Camellia reticulata
(Reticulata Camellia)



62
Livistona chinensis (Chinese
Fan Palm)



63
Cedrus deodara (Deodar
Cedar)



64
Jacaranda mimosifolia
(Jacaranda)



65
Eucalyptus saligna (Sydney
Blue Gum)



66
Stenocarpus sinuatus (Fire
Wheel Tree)



67
Dead



68
Eucalyptus saligna (Sydney
Blue Gum)



69
Eucalyptus saligna (Sydney
Blue Gum)



70
Eucalyptus pilularis
(Blackbutt)



71
Angophora costata (Smooth-
barked Apple)



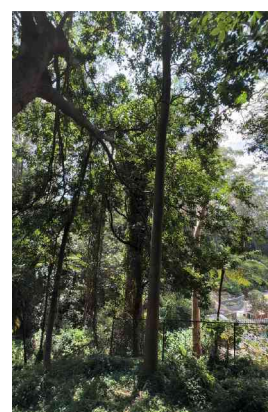
72
Syncarpia glomulifera
(Turpentine)



73
Syncarpia glomulifera
(Turpentine)



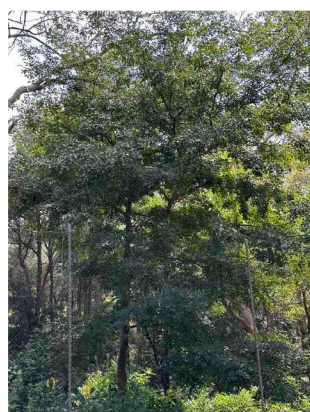
74
Pittosporum undulatum
(Sweet Pittosporum)



75
Brachychiton acerifolius
(Illawarra Flame Tree)



76
Grevillea robusta (Silky Oak)



77
Celtis australis (Nettle Tree)



78
Callistemon salignus (Willow
Bottlebrush)



79
Pittosporum undulatum
(Sweet Pittosporum)



80
Eucalyptus saligna (Sydney
Blue Gum)



81
Eucalyptus saligna (Sydney
Blue Gum)



82
Ligustrum lucidum (Large
Leaf Privet)



83
Livistona chinensis (Chinese
Fan Palm)



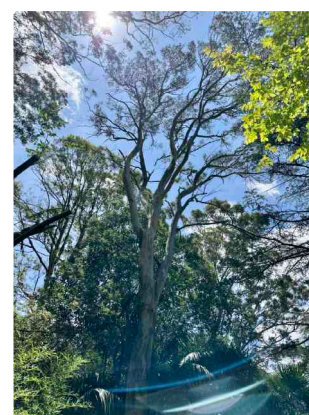
84
Livistona chinensis (Chinese
Fan Palm)



85
Livistona chinensis (Chinese
Fan Palm)



86
Livistona chinensis (Chinese
Fan Palm)



87
Eucalyptus punctata (Grey
Gum)



88
Cedrus deodara (Deodar
Cedar)



89
Ulmus glabra (Scotch Elm)



90
Archontophoenix
cunninghamiana (Bangalow
Palm)



91
Archontophoenix
cunninghamiana (Bangalow
Palm)



92
Archontophoenix
cunninghamiana (Bangalow
Palm)



93
Archontophoenix
cunninghamiana (Bangalow
Palm)



94
Archontophoenix
cunninghamiana (Bangalow
Palm)



95
Livistona chinensis (Chinese
Fan Palm)



96
Howea forsteriana (Kentia
Palm)



97
Livistona chinensis (Chinese
Fan Palm)



98
Livistona chinensis (Chinese
Fan Palm)



99
Livistona chinensis (Chinese
Fan Palm)



100
Livistona chinensis (Chinese
Fan Palm)



101
Livistona chinensis (Chinese
Fan Palm)



102
Ravenea rivularis (Majesty
Palm)



103
Camellia reticulata
(Reticulata Camellia)

[illegible]

NOTE: SUBJECT TO COUNCIL'S APPROVAL

Appendix G - Tree Roots

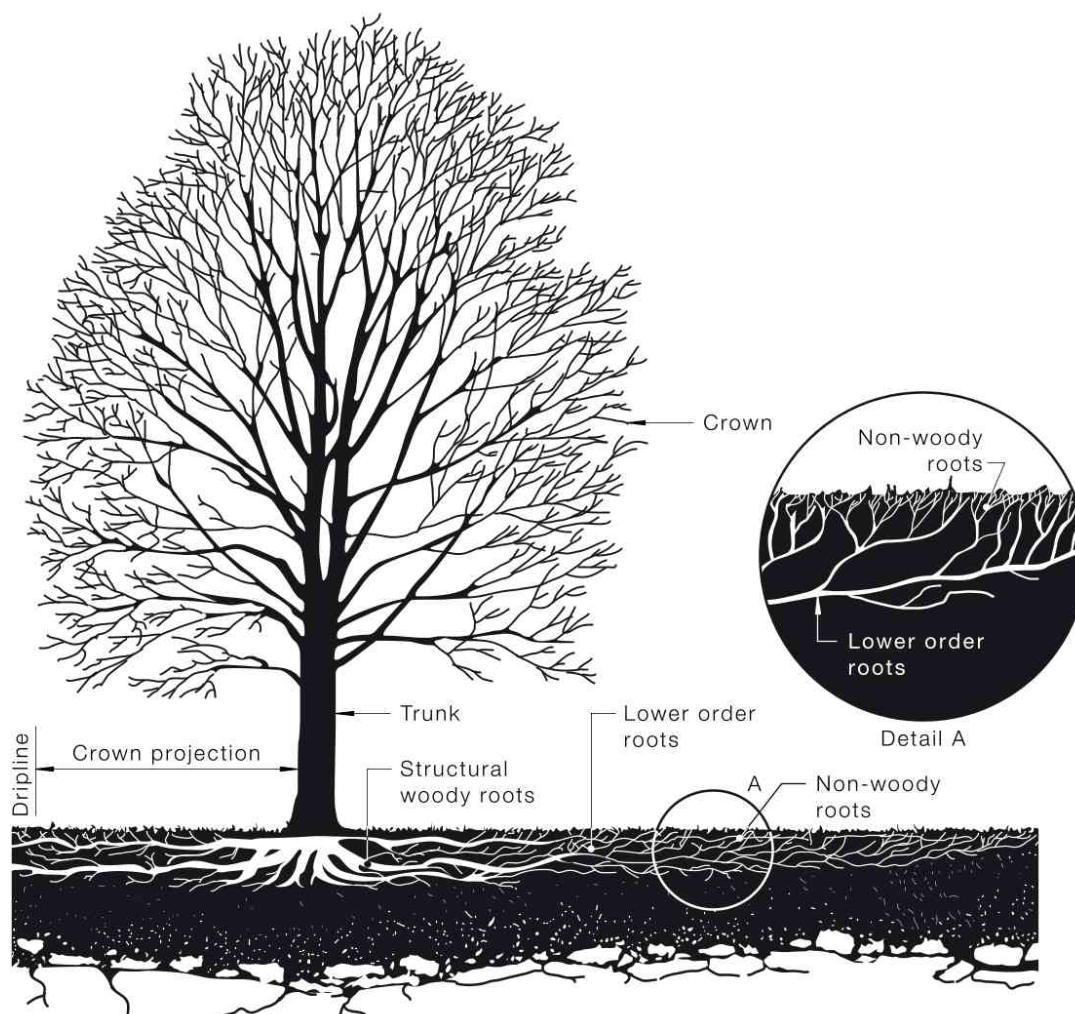


Figure 8. Tree Roots

Structural Woody Roots are large, woody roots that the tree requires for anchorage and support.

Lower Order Roots are used for anchorage, storage and transportation of water and nutrients

Non-woody Roots are fine, fibrous roots that take up water and minerals. Most absorbing roots grow upward into surface layers and mulch

Appendix H - Glossary

Shigo, A.L. (1986) A New Tree Biology Dictionary.

*Docketor, D (2001) City of Palo Alto, Tree Technical Manual.

Bark* - All tissue outside the vascular cambium. Bark is usually divided into inner bark active phloem and aging and dead crushed phloem.

Basal - Lower trunk area of the tree.

Branch* - Organ which supports leaves, flowers and fruit.

Branch collar* - Trunk tissue that forms around the base of a branch between the main stem and the branch wood and trunk wood to meet. Formed by compaction or expansion as the girth of the branch and trunk increase.

Canopy - The part of the crown composed of the leaves and small twigs.

Cavity - An open wound, characterized by the presence of decay and resulting in a hollow (Matheny & Clarke, 1994).

Codominant stems* - Stems or trunks of about the same size originating from the same position from the main stem.

Compaction - Compaction of soils causes roots to die due to lack of oxygen and water.

Compartmentalization* - Dynamic tree defence process involving protection features that resist the spread of pathogens.

Crown* - Portion of the tree consisting of branches and leaves and any part of the trunk from which branches arise.

Crown Projection - Area within the dripline or beneath the lateral extent of the crown (Geiger, 2004)

Decay* - Degeneration and delignification of plant tissue, including wood, by pathogens or microorganisms.

Dieback - Dieback is the reduction in the dynamic mass of a tree as twigs and branches die and are walled off by protection boundaries.

Epicormic shoots* - Shoots produced by dormant buds within the bark or stems of a tree as a result of stress, lopping or increase light. Epicormic shoots usually have a weaker form of branch attachment.

Included bark* - Inwardly formed bark at the junction of branches or codominant stems.

Kino - A dark red to brown resin-like substance produced by the trees in the genera Eucalyptus and other related genera. Kino forms when living cells are injured and infected.

Lopping* - Random cutting of branches or stems between branch union or at internodes on young trees.

Mycorrhiza - A symbiotic, non pathogenic, or weakly pathogenic association of fungi and non woody, absorbing roots of plants. The common belief is that the mycorrhiza help the tree with mineral absorption, especially phosphorus.

Microorganisms - An organism of microscopic size. Bacteria, the tree pathogens, may be as small as 3 microns wide by 5 microns long.

Pathogen - Any agent that causes disease.

Photosynthesis - A process where chlorophyll in plants traps the energy of the sun in a molecule of carbon dioxide and water that is called sugar.

Roots - An organ of a tree that serves to maintain mechanical support, to provide water and essential elements from the soil through absorption, and to store energy reserves.

Stem* - Organ which supports branches, leaves flowers and fruit.

Tree* - Long lived woody perennial plant greater than (or potentially greater than) 3m in height with one or relatively few stems.

Trunk* - The main stem.

Wound* - An opening that is created when the bark is cut, removed or injured.

Appendix I - TreeAZ (Barrell 2010)

TreeAZ Categories (Version 10.10-ANZ)

Category Z: Unimportant trees not worthy of being material constraint

Z	Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species	
	1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
	2	Too close to a building i.e exempt from legal protection because of proximity etc
	3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc
	High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure	
	4	Dead, dying, diseased or declining
	5	Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
	6	Instability, i.e. poor anchorage, increased exposure, etc
	Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people	
	7	Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
	8	Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc
	Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population	
	9	Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
	10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
	11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
	12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate

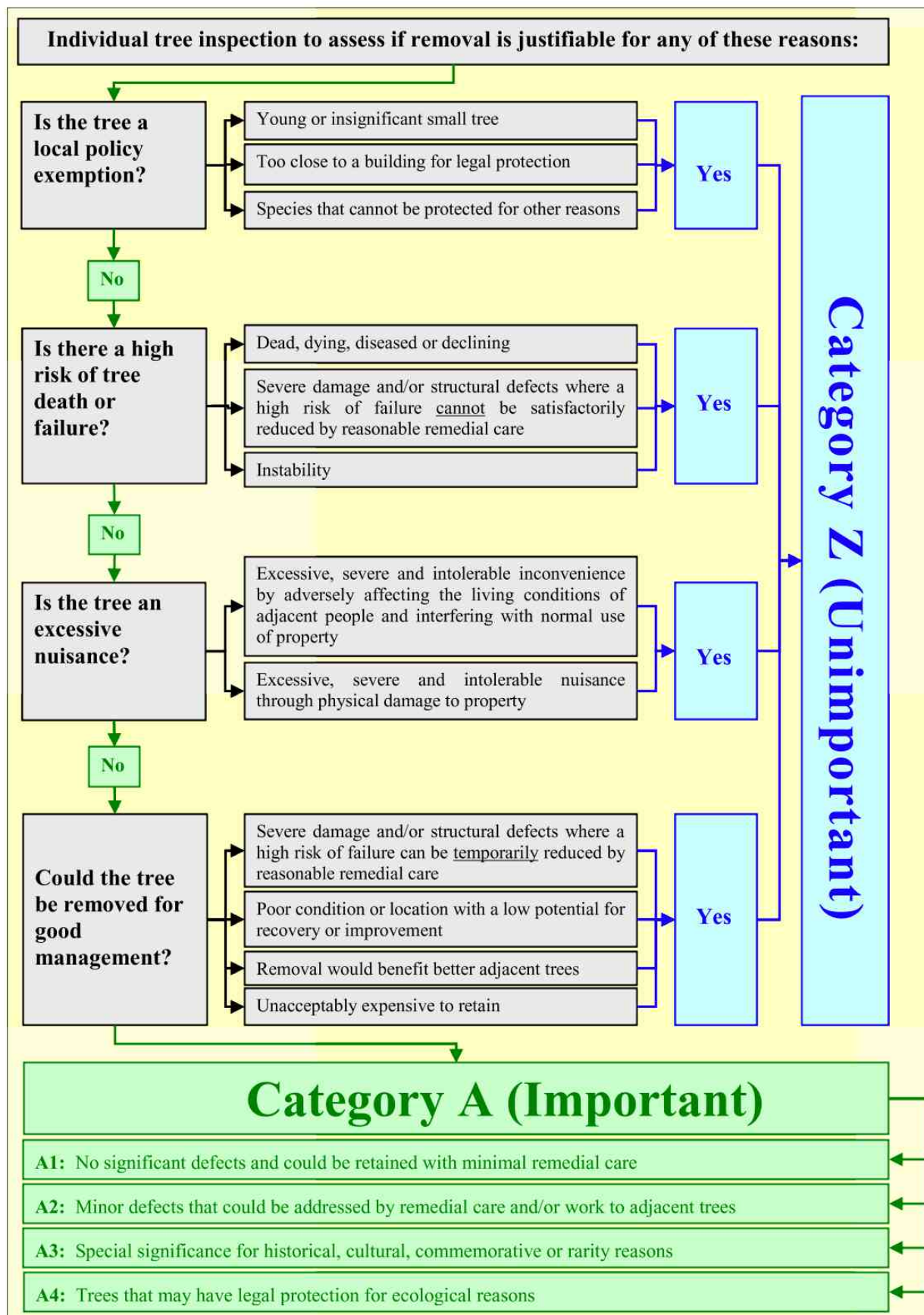
Category A Important trees suitable for retention for more than 10 years and worthy of being a material constraint

A1	No significant defects and could be retained with minimal remedial care
A2	Minor defects that could be addressed by remedial care and/or work to adjacent trees
A3	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
A4	Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

TreeAZ is designed by Barrell Tree Consultancy (www.barrelltreecare.co.uk) and is reproduced with their permission

TreeAZ Flow Chart



Appendix J - Tree Significance Assessment Criteria (IACA)

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.

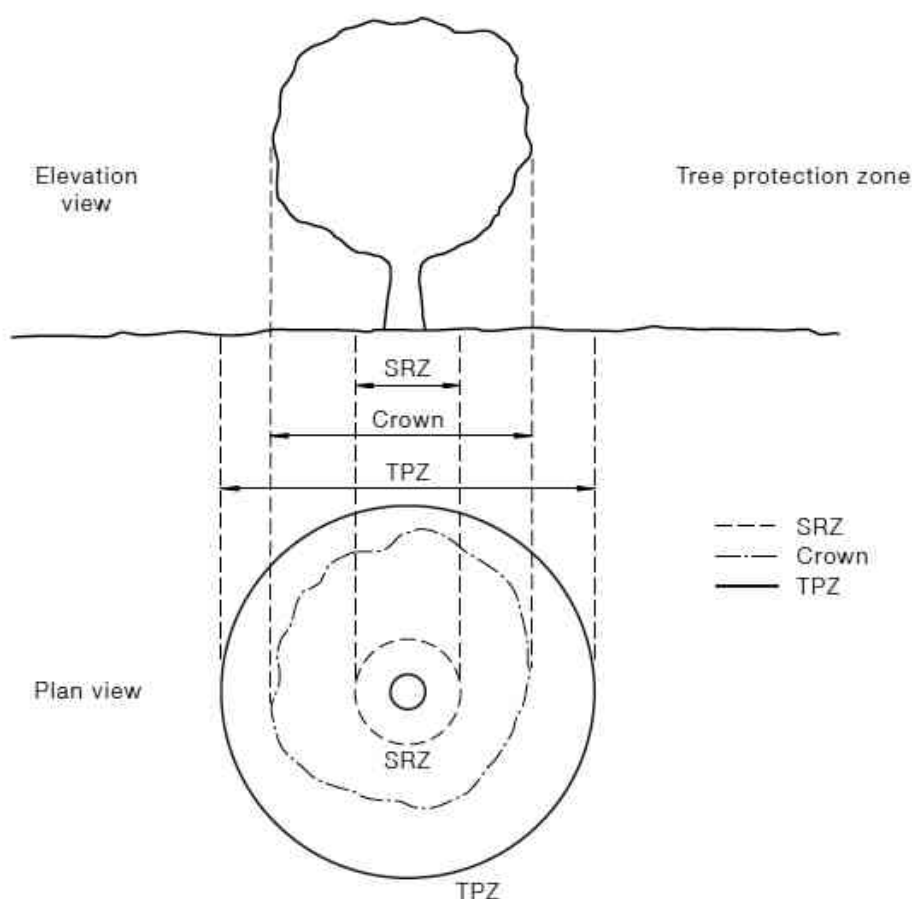
Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

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

Appendix K - Tree Protection Zones AS4970-2009

Tree Protection Zone

The tree protection zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.



Determining the TPZ

The **radius** of the TPZ is calculated for each tree by multiplying its DBH \times 12.
 $TPZ = DBH \times 12$
 Where DBH = trunk diameter measured at 1.4 m above ground

Radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required). Clause 3.3 covers variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 m outside the crown projection.

TPZ is measured radially from the trunk

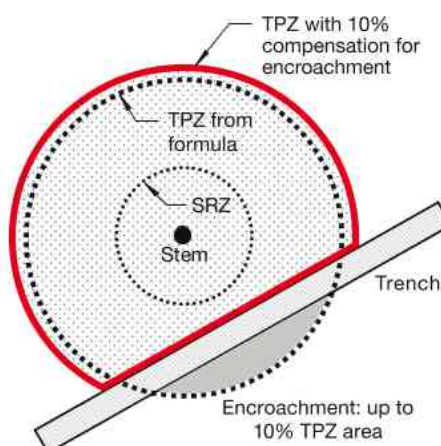
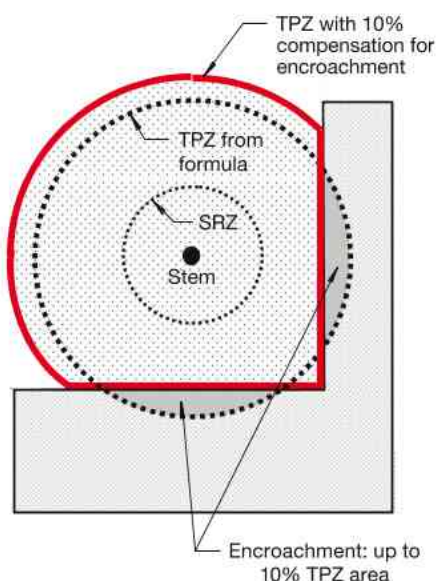
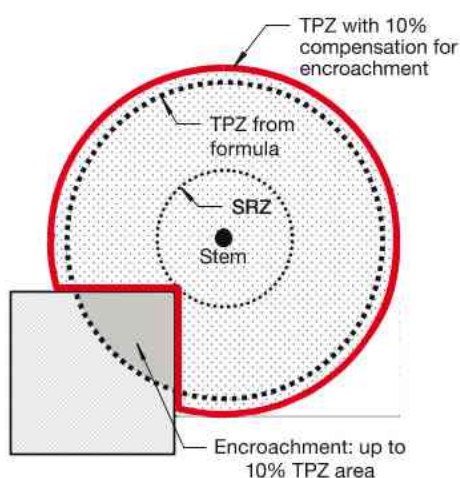
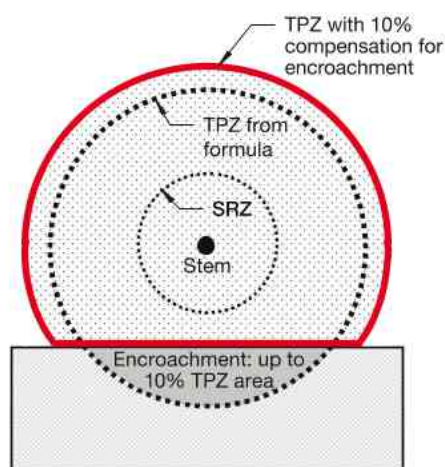
Appendix L - Tree Protection Zone Encroachments AS4970-2009

Minor Encroachments

The proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

Major Encroachments

The proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods.



Appendix M - Qualifications & Experience

Meredith Gibbs

Updated January 2023

Qualifications:

- 1999 Advanced Certificate in Urban Horticulture
- 2002 Horticulture Diploma (Arboriculture) AQF Level 5
- 2002 Occupational Health & Safety course
- 2002 Risk Management course
- 2002 Smart Train 008397
- 2010 Collecting Catchment Data
- 2011 Quantified Tree Risk Assessment
- 2014 Quantified Tree Risk Assessment
- 2015 Horticulture Diploma (Arboriculture) AQF Level 5
- 2018 White Card Number 2234996

Practical experience:

- 1996 - 1998 Nursery Hand - Horticulturist
- 1988 - 2001 Garden Maintenance - Horticulturist
- 1997 - 2004 Silver Springs Nursery (Owner/Operator)
- 2000 - Australis Tree Management (Owner/Operator)

Memberships and affiliations:

- Arboriculture Australia
- Australian Institute of Horticulture
- Australian Plant Society of NSW
- Burrendong Botanic Garden & Arboretum
- International Society of Arboriculture
- Quantified Tree Risk Assessment Registered User
- Society of Municipal Arborists
- Waite Arboretum
- Women in Arboriculture

Insurance:

- Professional Indemnity Insurance
 - Liberty International Underwriters
 - \$10,000,000.00
 - Policy No. HC-ME-SPC-01-104260
- Public Liability Insurance
 - Liberty International Underwriters
 - \$20,000,000.00
 - Policy No. 463763

Pro Bono Work:

- Middle Dural Public School

Continuing Professional Development:

- NAAA Conference, Mature Trees, 2001
- Claus Mattheck Seminar 2001
- ISAAC Conference - Parramatta 2004
- AILA Tree Management Forum 2005
- Jeremy Barrell Tree AZ & Report Writing Workshop 2006
- A Practitioner's Guide to Visual Tree Assessment – Mike Ellison 2007
- Quantified Tree Risk Assessment Workshop – Mike Ellison 2007

ISAAC Conference - Brisbane 2008
ISAAC Conference Workshop Dr. David Lonsdale 2008
ISAAC Conference Workshop Dr. Phillip Gibbons 2008
ISAAC Conference - Newcastle 2009
ISAAC Conference - Adelaide 2010
ISA International Conference Parramatta 2011
ISA International Conference Workshop Dr. Ken James 2011
Arboriculture Australia Annual Conference - Sunshine Coast 2014
Arboriculture Australia Annual Conference - Adelaide 2015
Arboriculture Australia Annual Conference - Canberra 2017
Jeremy Barrell Arboriculture Australia Workshop 2017
Arboriculture Australia Annual Conference - Hobart 2018
Arboriculture Australia Annual Conference - Alice Springs 2019
Arboriculture Australia Annual Conference - Gold Coast 2022

Past Projects

Pennant Street, Castle Hill, 2006
Fairway Drive, Kellyville, 2012
Summit Care, Baulkham Hills, 2013
105-115 Portman Street, Zetland, 2016
114 Tallawong Road, Rouse Hill, 2016
2 Lexington Drive, Bella Vista, 2016
The Hermitage, Gledswood Hills, 2010-2019
105 Cudgegong Road, Rouse Hill Development, 2018
33 Greenwich Road, Greenwich Redevelopment, 2017- 2022
Gosford Park Redevelopment, 2019
Blacktown Workers Sports Club Redevelopment, 2016-2019
Gregory Hills Industrial Estate, 2019
Grand Reve, Castle Hill, 2020
Carrington Road, Castle Hill, 2020
Solent Circuit, Norwest, 2021
Hubertus Country Club, Luddenham, 2021
McCall Gardens, Terry Road, Box Hill, 2022

Appendix N - Bibliography and References

- AS 4373 (2007) *Pruning of Amenity Trees*, Standards Australia, Standards Association of Australia, NSW, Australia.
- AS 4970 (2009). *Protection of Trees on Development Sites*, Standards Australia, Standards Association of Australia, NSW, Australia.
- Australian Government Dept of Agriculture, Water and the Environment (1999) *Environmental Protection and Biodiversity Conservation Act*
- Barrell, J. & Wadey, M. (2006) *Workshop Manual, Trees on Construction Sites*. Barrell Treecare Ltd, UK.
- Barrell, J (2016) *TreeAZ Assessment Rating*. Barrell Treecare Ltd, UK.
- Brooker, I. & Kleinig, D. (1999), *Field Guide to Eucalyptus, Volume 1, South-Eastern Australia*. Blooming Books. Sydney, Australia.
- Docktor, D. (2001) *City of Palo Alto, Tree Technical Manual*, The City of Palo Alto Department of Planning and Community Environment. Palo Alto, California, USA.
- Fairley, A. & Moore, P. (1989) *Native Plants of the Sydney District*. Kangaroo Press, Kenthurst NSW Australia.
- Greater Sydney Commission (2021) *Increasing urban tree canopy cover and delivering Green Grid connections, Planning Priority C16*. <https://www.greater.sydney/central-city-district-plan/sustainability/city-its-landscape/increasing-urban-tree-canopy-cover-and>.
- Harris, R.W., Clark, J.R., Matheny, N.P. (1999). *Arboriculture Integrated Management of Landscape Trees, Shrubs and Vines*. Third Edition. Prentice Hall, Upper Saddle River, New Jersey, USA.
- IACA (2010) *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au
- Johnson, T (2015) *Trees and permeable paving: future symbionts*. Treenet, Myrtle Bank, SA, Australia.
- Matheny, N & Clark, J.R (1994) *A Photographic Guide to The Evaluation of Hazard Trees In Urban Areas*. International Society of Arboriculture. USA.
- Matheny, N & Clark, J.R (1998) *Trees and Development. A Technical Guide to Preservation of Trees During Land Development*. International Society of Arboriculture. Exponet Publishers, Inc. Hagerstown In. USA.
- Mattheck, C. & Breloer, H. (1994) *The Body Language of Trees*. Research for Amenity Trees No.4 The Stationary Office, London.
- Near Map (2022) www.nearmaps.com.au
- NSW Government (2022) *Biodiversity Values Map for 73 & 77 Kulgoa Road, Pymble*. Visited 18/3/2023. <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap>
- NSW Government Department of Primary Industries (2022) *NSW Weed Wise*. Visited 18/3/2023 <http://weeds.dpi.nsw.gov.au>
- NSW Government (2022) *NSW Planning Portal for 73 & 77 Kulgoa Road, Pymble*. Visited 18/3/2023. <https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address>
- NSW National Parks & Wildlife Service (1995) *Threatened Species Conservation Act*. NSW NPWS, Hurstville, NSW, Australia.
- Phillips, R. (1978) *Trees in Britain, Europe and North America*. Pan Books, London, UK.

Rowell, R.J. (1991) *Ornamental Flowering Trees in Australia*. UNSW, Sydney Australia.

Rowell, R.J. (1996) *Ornamental Conifers for Australian Gardens*. UNSW, Sydney Australia.

Shigo, A.L. (1986) *A New Tree Biology Dictionary*, Shigo and Trees Associates, New Hampshire, USA.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

Wujeska-Klaue, Agnieszka & Pfautsch, Sebastian (2020) *The Best Urban Trees for Daytime Cooling Leave Nights Slightly Warmer Urban Studies*. School of Social Sciences, Locked Bag 1797, Penrith, NSW 2751, Australia Forests 2020, 11, 945; doi:10.3390/f11090945