

**AUSTRALIS**  
Tree Management



## *Arboriculture Impact Assessment*

**Blacktown Workers Sports Club**

170 Reservoir Road, Arndell Park  
Proposed Retirement Resort

**Commissioned By:** Paynter Dixon Constructions Pty Limited  
Level 2, Richardson Place  
NORTH RYDE NSW 2113

**Date:** 26 September 2019  
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## Document Details

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Meredith Gibbs  
Australis Tree Management  
26 September 2019

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## Summary

Australis Tree Management has been commissioned by Paynter Dixon Constructions Pty Limited to complete an arboriculture impact assessment. This report aims to identify the health and condition of the trees, potential impacts from proposed works and to provide recommendations regarding tree retention, protection and removals.

The development proposed is for the construction of retirement resort, including vehicular access parking facilities and associated works.

On the 10 September 2019, I attended the site at 170 Reservoir Road, Arndell Park and inspected forty-one (41) trees, which are located on site and within 5m of the boundaries of the site on adjoining properties.

I completed a modified Tree Survey Form (Matheny & Clark, 1994), applied 'TreeAZ' ratings (Barrell, 2016) as well as taking supporting photographs of the trees.

The inspection performed by visibly inspecting the trees from accessible points at ground level and assessing the supplied proposed plans. In total forty-one (41) trees were assessed. One (1) tree on site is dead and located within the proposed development area and proposed for removal. Prior to removal the dead trees should be assessed by an ecologist to comment regarding habitat capabilities and management.

- Nineteen (19) trees are located on the subject site and proposed for retention.
- Twenty-two (22) trees on site are proposed for removal as they are located within proposed development.

Trees proposed for retention within the subject site will require tree protection measures throughout the development works to ensure their long-term survival.

The tree defects and symptoms that were encountered have been discussed in section 5 and a detailed tree schedule is included in appendix a.

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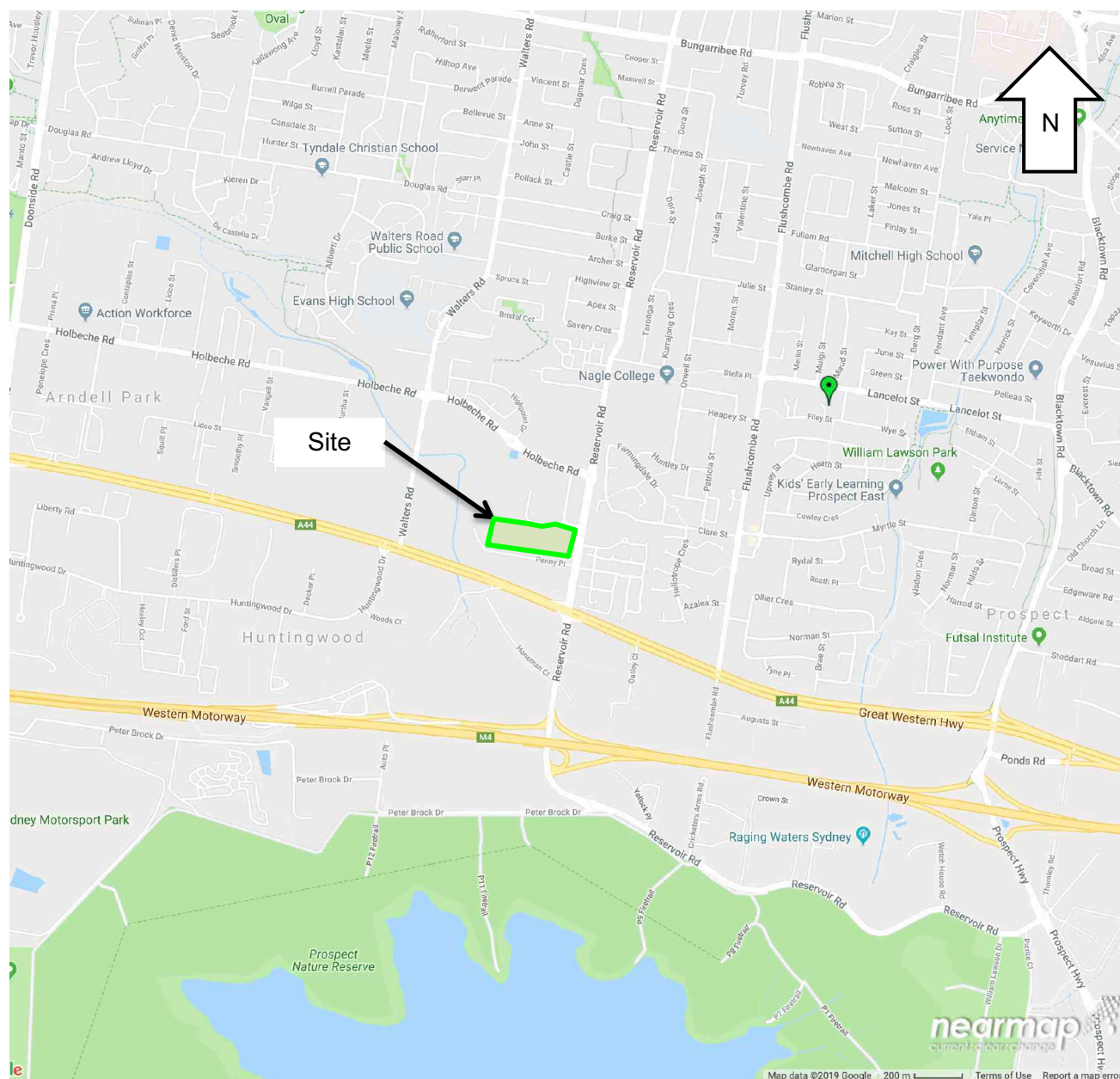
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## Abbreviations

|          |                            |
|----------|----------------------------|
| DCP..... | Development Control Plan   |
| LEP..... | Local Environmental Plan   |
| LGA..... | Local Government Authority |
| SRZ..... | Structural Root Zone       |
| TPO..... | Tree Preservation Order    |
| TPZ..... | Tree Protection Zone       |

## Location Map

170 Reservoir Road, Arndell Park

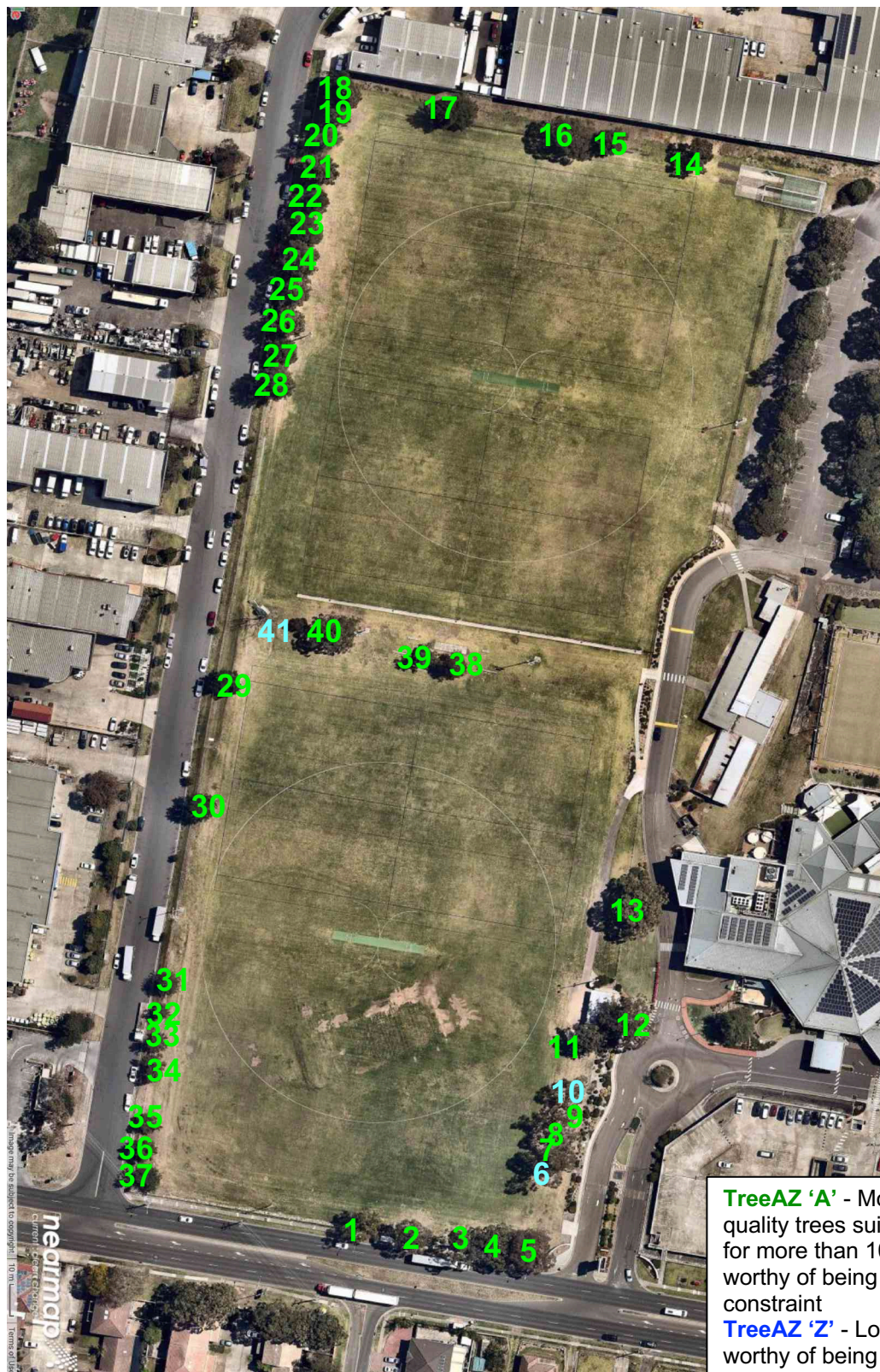
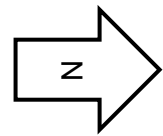


Source –Near Map 24 September 2019  
Figure 1. Location Map



## Site Map

170 Reservoir Road, Arndell Park



Source – Paynter Dixon Constructions Pty Limited  
Figure 2. Site Map

# 1 Introduction

## 1.1 Brief

Paynter Dixon Constructions Pty Limited provided instructions to inspect and assess the health and condition of the trees at 170 Reservoir Road, Arndell Park, including any tree within the vicinity of the proposed works including trees on adjoining properties. I have prepared an Arboriculture Impact Assessment on the proposed impacts of the development works on the subject trees. The report will provide recommendations regarding tree protection during the development process.

## 1.2 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 Tree Preservation Orders.

## 1.3 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.

## 1.4 Documents Provided

- Provided by Paynter Dixon Constructions Pty Limited 23 September 2019
  - Blacktown Site Compatibility Certificate\_2019.pdf

## 1.5 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 Blacktown City Council LEP and DCP. 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.



## 2 Methodology

### 2.1 Methods

The following relevant information was compiled for consideration of the proposed works. Details are located in the appendices.

- AS 4970- 2009 Protection of trees on development sites
- AS 4373 - 2007 Pruning of amenity trees
- Tree Survey Form (Matheny & Clark, 1994)
- Visual Tree Assessment (Mattheck & Breloer, 1994)

### 2.2 TreeAZ (Barrell, 2016)

- **TreeAZ 'A'** - Moderate and high-quality trees suitable for retention for more than 10 years, and worthy of being a material constraint
- **TreeAZ 'Z'** - Low quality trees not worthy of being material constraint

### 2.3 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 was of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level.

### 2.4 Species Identification

Identification of the subject trees are determined by visible features only at the time of the inspection. Every effort is made to correctly identify the subject trees where time permits. Photographs are compared with varying text listed in 'References'.

### 2.5 Tree Measurements

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.

### 2.6 Photography

A Nikon D5200 SLR camera or an iPhone were used. 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 colours were applied.

## 2.7 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 Blacktown City Council LGA.

### 3 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.

## 2.8 Tree Protection

The State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 includes provisions requiring the preservation of trees and bushland within Blacktown City LGA. This report relies on the information contained within Blacktown City Council's Tree Preservation. 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 LEP 2015.

### Tree Preservation

A prescribed tree for the purpose of Clause 5.9 of Blacktown LEP 2015 is:

- A perennial plant with a self-supporting stem which:
  - Has a height of more than 3 metres; and/or
  - Has a trunk diameter of more than 200mm or more measured 1.0 metre above ground level.

## 2.9 Vegetation

Vegetation types have been determined using a variety of methods depending on the location and LGA. Depending on the sources results can vary and should be used as a guide only.

## 2.10 Wildlife

Interactions between the tree and possible fauna were examined to the best of my ability through text listed in the references. An expert opinion may be required confirm or deny any fauna activities.

### 3 Site Visit and Observations

#### 3.1 Field Visit

The unaccompanied site visit was conducted on 10 September 2019 taking approximately 2 hours. All observations were from ground level without detailed investigations. The weather at the time of the inspection was cloudy, still and damp with average visibility.

#### 3.2 NSW Property Details

The following relevant information was gathered from NSW Planning Portal on 24 September 2019.

- Terrestrial Biodiversity – No
- Environmental Protection – No
- Native Vegetation Protection – No
- Riparian Lands & Watercourses – No
- Bushland in Urban Areas (SEPP No. 19) – Yes

#### 3.3 Brief Site Description

Blacktown Workers Sports Club is located in the suburb of Arndell Park. Number 170 Reservoir Road is on the western side of the road. The property consists of various sports facilities throughout.

#### 3.4 Location of the Trees

The trees in question are located predominately around the outside of the sports fields. The trees have been located on the supplied site plan and numbered accordingly. These plans are illustrative purposes only and should not be used directly for scaling measurements.

#### 3.5 Threatened Species

The subject tree species are not listed in the NSW Threatened Species Conservation Act (1995).

#### 3.6 Biodiversity Values

The subject site is mapped as not having Biodiversity Values according to The Biodiversity Values Map (BV Map) defined by the *Biodiversity Conservation Regulation 2017*.

#### 3.7 Biosecurity Act 2015

The assessed tree species are not listed in the Biosecurity Act 2015.

#### 3.8 Exempt Species

The assessed tree species are not listed in the councils' list of exempt species.

## 4 Results

The following tables do not include dead trees or trees unprotected trees. A complete tree schedule is located in appendix a.

- **TreeAZ 'A'** - Moderate and high-quality trees suitable for retention for more than 10 years, and worthy of being a material constraint
- **TreeAZ 'Z'** - Low quality trees not worthy of being material constraint

### 4.1 On Site Trees and Life Expectancy

| Tree no.  | Species   | Life Expectancy |
|---|---|-----------------|
| 1   | <i>Corymbia gummifera</i> (Red Bloodwood)         | 40+yrs          |
| 2   | <i>Corymbia citriodora</i> (Lemon-scented Gum)    | 40+yrs          |
| 3, 5  | <i>Corymbia maculata</i> (Spotted Gum)            | 40+yrs          |
| 4, 13, 14, 40   | <i>Eucalyptus microcorys</i> (Tallowwood)         | 40+yrs          |
| 6, 10   | <i>Corymbia citriodora</i> (Lemon-scented Gum)    | 40+yrs          |
| 7, 8, 9   | <i>Corymbia citriodora</i> (Lemon-scented Gum)    | 40+yrs          |
| 11  | <i>Eucalyptus paniculata</i> (Grey Ironbark)      | 40+yrs          |
| 12  | <i>Eucalyptus saligna</i> (Sydney Blue Gum)       | 40+yrs          |
| 15, 17, 18, 19,<br>21, 22, 23, 24,<br>25, 26, 27, 28,<br>35, 36, 38, 39 | <i>Casuarina cunninghamiana</i> (River Oak)       | 40+yrs          |
| 16  | <i>Eucalyptus moluccana</i> (Grey Box)            | 40+yrs          |
| 20, 32, 33, 34  | <i>Casuarina cunninghamiana</i> (River Oak)       | 15-40yrs        |
| 29, 30  | <i>Pinus radiata</i> (Monterey Pine)              | 15-40yrs        |
| 31  | <i>Grevillea robusta</i> (Silky Oak)              | 15-40yrs        |
| 37  | <i>Grevillea robusta</i> (Silky Oak)              | 40+yrs          |
| 41  | <i>Eucalyptus fibrosa</i> (Broad-leaved Ironbark) | Dead            |

Table 1. On Site Trees and Life Expectancy



## 4.2 On Site Proposed for Retention

| Tree no. | Species  | TPZ  | Proposed TPZ Encroachment |
|----------|--|------|---------------------------|
| 1        | <i>Corymbia gummifera</i> (Red Bloodwood)      | 6m   | 16%                       |
| 2        | <i>Corymbia citriodora</i> (Lemon-scented Gum) | 5.4m | 0%                        |
| 3        | <i>Corymbia maculata</i> (Spotted Gum)         | 6m   | 0%                        |
| 4        | <i>Eucalyptus microcorys</i> (Tallowwood)      | 7.2m | 0%                        |
| 5        | <i>Corymbia maculata</i> (Spotted Gum)         | 7.2m | 0%                        |
| 6        | <i>Corymbia citriodora</i> (Lemon-scented Gum) | 3.6m | 0%                        |
| 7        | <i>Corymbia citriodora</i> (Lemon-scented Gum) | 4.8m | 0%                        |
| 8        | <i>Corymbia citriodora</i> (Lemon-scented Gum) | 4.2m | 0%                        |
| 9        | <i>Corymbia citriodora</i> (Lemon-scented Gum) | 4.2m | 0%                        |
| 10       | <i>Corymbia citriodora</i> (Lemon-scented Gum) | 3.0m | 0%                        |
| 13       | <i>Eucalyptus microcorys</i> (Tallowwood)      | 7.2m | 41%                       |
| 14       | <i>Eucalyptus microcorys</i> (Tallowwood)      | 7.2m | 41%                       |
| 15       | <i>Casuarina cunninghamiana</i> (River Oak)    | 6.6m | 40%                       |
| 16       | <i>Eucalyptus moluccana</i> (Grey Box)         | 8.4m | 35%                       |
| 17       | <i>Casuarina cunninghamiana</i> (River Oak)    | 7.8m | 25%                       |
| 25       | <i>Casuarina cunninghamiana</i> (River Oak)    | 6.0m | 7%                        |
| 26       | <i>Casuarina cunninghamiana</i> (River Oak)    | 6.0m | 0%                        |
| 27       | <i>Casuarina cunninghamiana</i> (River Oak)    | 5.4m | 0%                        |
| 37       | <i>Grevillea robusta</i> (Silky Oak)           | 5.4m | 0%                        |
| 38       | <i>Casuarina cunninghamiana</i> (River Oak)    | 5.4m | 0%                        |

Table 2 On Site Trees Proposed for Retention

### 4.3 On Site Proposed for Removal

| Tree no. | Species   | TPZ  | Proposed TPZ Encroachment |
|----------|---|------|---------------------------|
| 11       | <i>Eucalyptus paniculata</i> (Grey Ironbark)      | 6.8m | 100%                      |
| 12       | <i>Eucalyptus saligna</i> (Sydney Blue Gum)       | 8.4m | 100%                      |
| 18       | <i>Casuarina cunninghamiana</i> (River Oak)       | 8.4m | 100%                      |
| 19       | <i>Casuarina cunninghamiana</i> (River Oak)       | 6.0m | 100%                      |
| 20       | <i>Casuarina cunninghamiana</i> (River Oak)       | 5.4m | 100%                      |
| 21       | <i>Casuarina cunninghamiana</i> (River Oak)       | 6.0m | 100%                      |
| 22       | <i>Casuarina cunninghamiana</i> (River Oak)       | 6.0m | 100%                      |
| 23       | <i>Casuarina cunninghamiana</i> (River Oak)       | 5.4m | 100%                      |
| 24       | <i>Casuarina cunninghamiana</i> (River Oak)       | 6.6m | 100%                      |
| 28       | <i>Casuarina cunninghamiana</i> (River Oak)       | 6.0m | 14%                       |
| 29       | <i>Pinus radiata</i> (Monterey Pine)              | 6.6m | 40%                       |
| 30       | <i>Pinus radiata</i> (Monterey Pine)              | 6.6m | 40%                       |
| 31       | <i>Grevillea robusta</i> (Silky Oak)              | 4.8m | 18%                       |
| 32       | <i>Casuarina cunninghamiana</i> (River Oak)       | 3.6m | 17%                       |
| 33       | <i>Casuarina cunninghamiana</i> (River Oak)       | 6.0m | 29%                       |
| 34       | <i>Casuarina cunninghamiana</i> (River Oak)       | 6.0m | 24%                       |
| 35       | <i>Casuarina cunninghamiana</i> (River Oak)       | 4.8m | 30%                       |
| 36       | <i>Casuarina cunninghamiana</i> (River Oak)       | 5.4m | 33%                       |
| 38       | <i>Casuarina cunninghamiana</i> (River Oak)       | 5.4m | 0%                        |
| 39       | <i>Casuarina cunninghamiana</i> (River Oak)       | 7.2m | 0%                        |
| 40       | <i>Eucalyptus microcorys</i> (Tallowwood)         | 7.2m | 0%                        |
| 41       | <i>Eucalyptus fibrosa</i> (Broad-leaved Ironbark) | N/A  | 100%                      |

Table 3 On Site Trees Proposed for Removal

## 5 Discussion

### 5.1 On Site Trees Proposed for Retention without TPZ Encroachments

#### 5.1.1 Tree no. 2 *Corymbia citriodora* (Lemon-scented Gum)

- 5.1.1.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

#### 5.1.2 Tree no. 3 *Corymbia maculata* (Spotted Gum)

- 5.1.2.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

#### 5.1.3 Tree no. 4 *Eucalyptus microcorys* (Tallowwood)

- 5.1.3.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

#### 5.1.4 Tree no. 5 *Corymbia maculata* (Spotted Gum)

- 5.1.4.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

#### 5.1.5 Tree no. 6 *Corymbia citriodora* (Lemon-scented Gum)

- 5.1.5.1 This native tree is located on site. It is young in age and in low (2-3) health and condition with a 'TreeAZ' rating of 'Z1' and a life expectancy of 15-40yrs with no significant issues sighted.

#### 5.1.6 Tree no. 7 *Corymbia citriodora* (Lemon-scented Gum)

- 5.1.6.1 This native tree is located on site. It is semi mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

#### 5.1.7 Tree no. 8 *Corymbia citriodora* (Lemon-scented Gum)

- 5.1.7.1 This native tree is located on site. It is young in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs with no significant issues sighted.

#### 5.1.8 Tree no. 9 *Corymbia citriodora* (Lemon-scented Gum)

- 5.1.8.1 This native tree is located on site. It is young in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

5.1.9 Tree no. 10 *Corymbia citriodora* (Lemon-scented Gum)

- 5.1.9.1 This native tree is located on site. It is young in age and in average (3) health and condition with a 'TreeAZ' rating of 'Z1' and a life expectancy of 40+yrs with no significant issues sighted.

5.1.10 Tree no. 13 *Eucalyptus microcorys* (Tallowwood)

- 5.1.10.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

5.1.11 Tree no. 26 *Casuarina cunninghamiana* (River Oak)

- 5.1.11.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted. There are no proposed works within the 6m TPZ for this tree.

5.1.12 Tree no. 27 *Casuarina cunninghamiana* (River Oak)

- 5.1.12.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted. There are no proposed works within the 5.4m TPZ for this tree.

5.1.13 Tree no. 37 *Grevillea robusta* (Silky Oak)

- 5.1.13.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted. There are no proposed works within the 5.4m TPZ for this tree.

## 5.2 On Site Trees Proposed for Retention with TPZ Encroachments

5.2.1 Tree no. 1 *Corymbia gummifera* (Red Bloodwood)

- 5.2.1.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.2.1.2 The proposed pedestrian walkway is located 6m from the trunk, which is inside the 7.2m TPZ with a 16.6% encroachment. No canopy pruning is necessary for the proposed development.
- 5.2.1.3 The proposed encroachment will be significantly reduced if the foot path was permeable and suspended, providing that support footings are hand excavated to avoid roots measuring over 40mm in diameter. Trenching is not recommended due to the severance of necessary feeder roots used for nutrient and moisture uptake will cause stress and may reduce life expectancy.



- 5.2.1.4 Another option for the pedestrian walkway would be to lay a permeable surface on natural grade with no trenching. The root system must be protected during the proposed excavation preventing any damaged or severance to any root measuring over 40mm in diameter.
- 5.2.2 Tree no. 14 *Eucalyptus microcorys* (Tallowwood)
  - 5.2.2.1 This native tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
  - 5.2.2.2 The proposed pedestrian walkway is located 1m from the trunk, which is inside the 7.2m TPZ with a 41.2% encroachment.
  - 5.2.2.3 The proposed encroachment will be significantly reduced if the pedestrian walkway was permeable and suspended also providing that roots measuring over 40mm in diameter are protected.
- 5.2.3 Tree no. 15 *Casuarina cunninghamiana* (River Oak)
  - 5.2.3.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
  - 5.2.3.2 The proposed pedestrian walkway is located 1m from the trunk, which is inside the 6.6m TPZ with a 40.4% encroachment.
  - 5.2.3.3 The proposed encroachment will be significantly reduced if the pedestrian walkway was permeable and suspended also providing that roots measuring over 40mm in diameter are protected.
- 5.2.4 Tree no. 16 *Eucalyptus moluccana* (Grey Box)
  - 5.2.4.1 This indigenous tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
  - 5.2.4.2 The proposed pedestrian walkway is located 2m from the trunk, which is inside the 8.4m TPZ with a 35.0% encroachment.
  - 5.2.4.3 Once again, the proposed encroachment impact will be significantly reduced if the pedestrian walkway was permeable and suspended also providing that roots measuring over 40mm in diameter are protected.
- 5.2.5 Tree no. 17 *Casuarina cunninghamiana* (River Oak)
  - 5.2.5.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted. The proposed pedestrian walkway is located 3m from the trunk, which is inside the 7.8m TPZ with a 24.6% encroachment.

- 5.2.5.2 Once again, the proposed impact will be significantly reduced if the pedestrian walkway was permeable and suspended also providing that roots measuring over 40mm in diameter are protected.

5.2.6 Tree no. 25 *Casuarina cunninghamiana* (River Oak)

- 5.2.6.1 This native tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.2.6.2 The proposed building is located 4.5m from the trunk, which is inside the 6m TPZ with a 7.2% encroachment. There is compensatory natural ground to the south of this tree. There are no proposed works within the 3m SRZ. The proposed encroachment is considered minor in accordance with AS4970-2009. Roots measuring over 40mm in diameter must be protected from damage.

### 5.3 On Site Trees Proposed for Removal

5.3.1 Tree no. 11 *Eucalyptus paniculata* (Grey Ironbark)

- 5.3.1.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.3.1.2 The tree is located within the proposed 'road 3' envelope and therefore proposed for removal.

5.3.2 Tree no. 12 *Eucalyptus saligna* (Sydney Blue Gum)

- 5.3.2.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.3.2.2 The tree is located within the proposed 'road 3 envelope and therefore proposed for removal.

5.3.3 Tree no. 18 *Casuarina cunninghamiana* (River Oak)

- 5.3.3.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.3.3.2 The tree is located within the proposed 'road 1' envelope and therefore proposed for removal.

5.3.4 Tree no. 19 *Casuarina cunninghamiana* (River Oak)

- 5.3.4.1 This native tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.3.4.2 The tree is located within the proposed 'road 1' envelope and therefore proposed for removal.

5.3.5 Tree no. 20 *Casuarina cunninghamiana* (River Oak)

- 5.3.5.1 This native tree is located on site. It is semi mature in age and in low (2-3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs with no significant issues sighted.
- 5.3.5.2 The tree is located within the proposed 'road 1' envelope and therefore proposed for removal.

5.3.6 Tree no. 21 *Casuarina cunninghamiana* (River Oak)

- 5.3.6.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.3.6.2 The tree is located within the proposed RACF entry envelope and therefore proposed for removal.

5.3.7 Tree no. 22 *Casuarina cunninghamiana* (River Oak)

- 5.3.7.1 This native tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs. The tree has included bark within some branch unions, though at this time there are no indications of potential failure or separation.
- 5.3.7.2 The tree is located within the proposed RACF entry envelope and therefore proposed for removal.

5.3.8 Tree no. 23 *Casuarina cunninghamiana* (River Oak)

- 5.3.8.1 This native tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs. This tree also has included bark within branch unions.
- 5.3.8.2 The tree is located within the proposed RACF entry envelope and therefore proposed for removal.

5.3.9 Tree no. 24 *Casuarina cunninghamiana* (River Oak)

- 5.3.9.1 This native tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted. The tree is located within the proposed RACF entry envelope and therefore proposed for removal.

5.3.10 Tree no. 28 *Casuarina cunninghamiana* (River Oak)

- 5.3.10.1 This native tree is located on site. It is mature in age and in good (4) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

5.3.10.2 The proposed building is inside the TPZ with a 14.2% encroachment. The proposed encroachment is considered major in accordance with AS4970-2009. The tree is unlikely to tolerate the proposed root system disturbances. The loss in root system will cause stress to the tree, reduce its life expectancy and possibly destabilise the tree, therefore it is proposed for removal.

5.3.11 Tree no. 29 *Pinus radiata* (Monterey Pine)

5.3.11.1 This exotic tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs with no significant issues sighted.

5.3.11.2 The proposed building is inside the TPZ with a 40.4% encroachment. Again, the proposed encroachment is considered major in accordance with AS4970-2009. The tree is unlikely to tolerate the proposed root system disturbances. The loss in root system will cause stress to the tree and reduce its life expectancy, therefore it is proposed for removal.

5.3.12 Tree no. 30 *Pinus radiata* (Monterey Pine)

5.3.12.1 This exotic tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs with no significant issues sighted.

5.3.12.2 The proposed building is inside the TPZ with a 40.4% encroachment. The proposed encroachment is considered major in accordance with AS4970-2009. The tree is unlikely to tolerate the proposed root system disturbances. The loss in root system will cause stress to the tree and reduce its life expectancy.

5.3.13 Tree no. 31 *Grevillea robusta* (Silky Oak)

5.3.13.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs. The tree has included bark unions within branch unions and scaffold branch unions.

5.3.13.2 The pedestrian walkway is inside the TPZ including the SRZ with a 18.4% encroachment. The proposed encroachment is considered major in accordance with AS4970-2009. The tree is unlikely to tolerate the proposed root system disturbances. The loss in root system will cause stress to the tree and reduce its life expectancy.

5.3.14 Tree no. 32 *Casuarina cunninghamiana* (River Oak)

5.3.14.1 This native tree is located on site. It is young in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs with no significant issues sighted.



- 5.3.14.2 The proposed building is inside the TPZ with a 16.6% encroachment. The proposed encroachment is considered major in accordance with AS4970-2009. The tree is unlikely to tolerate the proposed root system disturbances therefore it is proposed for removal.

5.3.15 Tree no. 33 *Casuarina cunninghamiana* (River Oak)

- 5.3.15.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs with no significant issues sighted.
- 5.3.15.2 The proposed building is inside the TPZ with a 29.2% encroachment. The proposed encroachment is considered major in accordance with AS4970-2009. The tree is unlikely to tolerate the proposed root system disturbances and proposed for removal.

5.3.16 Tree no. 34 *Casuarina cunninghamiana* (River Oak)

- 5.3.16.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 15-40yrs with no significant issues sighted.
- 5.3.16.2 The proposed building is inside the TPZ with a 24.3% encroachment. The proposed encroachment is considered major in accordance with AS4970-2009. Once again, the tree is unlikely to tolerate the proposed root system disturbances therefore it is proposed for removal.

5.3.17 Tree no. 35 *Casuarina cunninghamiana* (River Oak)

- 5.3.17.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.3.17.2 The proposed building is inside the TPZ with a 30.4% encroachment and considered major in accordance with AS4970-2009. The tree is unlikely to tolerate the proposed root system disturbances therefore it is proposed for removal.

5.3.18 Tree no. 36 *Casuarina cunninghamiana* (River Oak)

- 5.3.18.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.
- 5.3.18.2 The proposed building is inside the TPZ with a 32.6% encroachment. The tree is unlikely to tolerate the proposed root system disturbances therefore it is proposed for removal.

5.3.19 Tree no. 38 *Casuarina cunninghamiana* (River Oak)

- 5.3.19.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

5.3.19.2 The tree has no works envelope proposed within the TPZ though according to the supplied plans it is proposed for removal.

5.3.20 Tree no. 39 *Casuarina cunninghamiana* (River Oak)

5.3.20.1 This native tree is located on site. It is semi mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

5.3.20.2 The tree has no works envelope proposed within the TPZ though according to the supplied plans it is proposed for removal.

5.3.21 Tree no. 40 *Eucalyptus microcorys* (Tallowwood)

5.3.21.1 This native tree is located on site. It is mature in age and in average (3) health and condition with a 'TreeAZ' rating of 'A' and a life expectancy of 40+yrs with no significant issues sighted.

5.3.21.2 The tree has no works envelope proposed within the TPZ though according to the supplied plans it is proposed for removal.

5.3.22 Tree no. 41 *Eucalyptus fibrosa* (Broad-leaved Ironbark)

5.3.22.1 This indigenous tree is located on site and dead.

## 6 Conclusion & Recommendations

### 6.1 On Site Trees Proposed for Retention without TPZ Encroachments

#### 6.1.1 Recommendations - Apply general tree protection methods (section 7)

- Tree no. 2 *Corymbia citriodora* (Lemon-scented Gum)
- Tree no. 3 *Corymbia maculata* (Spotted Gum)
- Tree no. 4 *Eucalyptus microcorys* (Tallowwood)
- Tree no. 5 *Corymbia maculata* (Spotted Gum)
- Tree no. 6 *Corymbia citriodora* (Lemon-scented Gum)
- Tree no. 7 *Corymbia citriodora* (Lemon-scented Gum)
- Tree no. 8 *Corymbia citriodora* (Lemon-scented Gum)
- Tree no. 9 *Corymbia citriodora* (Lemon-scented Gum)
- Tree no. 10 *Corymbia citriodora* (Lemon-scented Gum)
- Tree no. 13 *Eucalyptus microcorys* (Tallowwood)
- Tree no. 26 *Casuarina cunninghamiana* (River Oak)
- Tree no. 27 *Casuarina cunninghamiana* (River Oak)
- Tree no. 37 *Grevillea robusta* (Silky Oak)

### 6.2 On Site Trees Proposed for Retention with TPZ Encroachments

6.2.1 Tree no. 1 *Corymbia gummifera* (Red Bloodwood) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The proposed foot path encroaches the TPZ by a major 16% therefore the following recommendations must be applied.

- Recommendations
  - No excavation within SRZ
  - Hand excavation within TPZ
  - Do not cut roots over 40mm in diameter
  - Properly prune roots under 40mm sharply
  - No soil level changes within TPZ
  - Mulch using composted leaf mulch
  - Apply micro irrigation to TPZ remaining connected to a designated water source
  - Apply general tree protection methods (section 7)

6.2.2 Tree no. 14 *Eucalyptus microcorys* (Tallowwood) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The proposed pedestrian walkway is located 1 from the trunk, encroaching the TPZ by a major 41%.

- Recommendations
  - Pedestrian walkway be permeable and suspended
  - No excavation within SRZ
  - Hand excavation within TPZ
  - Do not cut roots over 40mm in diameter
  - Properly prune roots under 40mm sharply

- No soil level changes within TPZ
- Use raised walkways or boards within TPZ
- Apply general tree protection methods (section 7)

6.2.3 Tree no. 15 *Casuarina cunninghamiana* (River Oak) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The proposed pedestrian walkway is located 1 from the trunk, encroaching the TPZ by a major 40%.

- Recommendations
  - Pedestrian walkway be permeable and suspended
  - No excavation within SRZ
  - Hand excavation within TPZ
  - Do not cut roots over 40mm in diameter
  - Properly prune roots under 40mm sharply
  - No soil level changes within TPZ
  - Use raised walkways or boards within TPZ
  - Apply general tree protection methods (section 7)

6.2.4 Tree no. 16 *Eucalyptus moluccana* (Grey Box) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The proposed pedestrian walkway is located 2 from the trunk, encroaching the TPZ by a major 35%.

- Recommendations
  - Pedestrian walkway be permeable and suspended
  - No excavation within SRZ
  - Hand excavation within TPZ
  - Do not cut roots over 40mm in diameter
  - Properly prune roots under 40mm sharply
  - No soil level changes within TPZ
  - Use raised walkways or boards within TPZ
  - Apply general tree protection methods (section 7)

6.2.5 Tree no. 17 *Casuarina cunninghamiana* (River Oak) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The proposed pedestrian walkway is located 3 from the trunk, encroaching the TPZ by a major 25%.

- Recommendations
  - Pedestrian walkway be permeable and suspended
  - No excavation within SRZ
  - Hand excavation within TPZ
  - Do not cut roots over 40mm in diameter
  - Properly prune roots under 40mm sharply
  - No soil level changes within TPZ
  - Use raised walkways or boards within TPZ
  - Apply general tree protection methods (section 7)



6.2.6 Tree no. 25 *Casuarina cunninghamiana* (River Oak) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The proposed building is located 4.5 from the trunk, encroaching the TPZ by a minor 7%, therefore the following recommendations must be applied.

- Recommendations
  - No excavation within SRZ
  - Do not cut roots over 40mm in diameter
  - Properly prune roots under 40mm sharply
  - No soil level changes within TPZ
  - Mulch using composted leaf mulch
  - Apply mirco irrigation to TPZ remaining connected to a designated water source
  - Apply general tree protection methods (section 7)

### 6.3 Trees Proposed for Removal

6.3.1 Trees located within the proposed 'Road 1' envelope

- Tree no. 18 *Casuarina cunninghamiana* (River Oak)
- Tree no. 19 *Casuarina cunninghamiana* (River Oak)
- Tree no. 20 *Casuarina cunninghamiana* (River Oak)

6.3.2 Trees located within the proposed 'Road 3' envelope

- Tree no. 11 *Eucalyptus paniculata* (Grey Ironbark)
- Tree no. 12 *Eucalyptus saligna* (Sydney Blue Gum)

6.3.3 Trees located within the proposed 'RACF Entry' envelope

- Tree no. 21 *Casuarina cunninghamiana* (River Oak)
- Tree no. 22 *Casuarina cunninghamiana* (River Oak)
- Tree no. 23 *Casuarina cunninghamiana* (River Oak)
- Tree no. 24 *Casuarina cunninghamiana* (River Oak)

6.3.4 Trees with proposed TPZ Encroachments

6.3.4.1 Tree no. 28 *Casuarina cunninghamiana* (River Oak) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The proposed building is located 2.5m from the trunk, encroaching the TPZ by a major 14%, therefore this tree is proposed for removal.

6.3.4.2 Tree no. 29 *Pinus radiata* (Monterey Pine) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 15-40yrs life expectancy. The tree is located immediately adjacent to the proposed development envelope with an excessive encroachment therefore it is proposed for removal.

6.3.4.3 Tree no. 30 *Pinus radiata* (Monterey Pine) is a mature tree located on site with a 'TreeAZ' rating of 'A' and a 15-40yrs life expectancy. The tree is located immediately adjacent to the proposed development

envelope with an excessive encroachment therefore it is proposed for removal.

- 6.3.4.4 Tree no. 31 *Grevillea robusta* (Silky Oak) is a semi mature tree located on site with a 'TreeAZ' rating of 'A' and a 15-40yrs life expectancy. The proposed pedestrian walkway is located 2.5m from the trunk, encroaching the TPZ by a major 18%, therefore this tree is proposed for removal.
- 6.3.4.5 Tree no. 32 *Casuarina cunninghamiana* (River Oak) is a young tree located on site with a 'TreeAZ' rating of 'A' and a 15-40yrs life expectancy. The tree is located immediately adjacent to the proposed development envelope with an excessive encroachment therefore it is proposed for removal.
- 6.3.4.6 Tree no. 33 *Casuarina cunninghamiana* (River Oak) is a semi mature tree located on site with a 'TreeAZ' rating of 'A' and a 15-40yrs life expectancy. The tree is located immediately adjacent to the proposed development envelope with an excessive encroachment therefore it is proposed for removal.
- 6.3.4.7 Tree no. 34 *Casuarina cunninghamiana* (River Oak) is a semi mature tree located on site with a 'TreeAZ' rating of 'A' and a 15-40yrs life expectancy. The proposed building is located 2.5m from the trunk, encroaching the TPZ by a major 24%, therefore this tree is proposed for removal.
- 6.3.4.8 Tree no. 35 *Casuarina cunninghamiana* (River Oak) is a semi mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The tree is located immediately adjacent to the proposed development envelope with an excessive encroachment therefore it is proposed for removal.
- 6.3.4.9 Tree no. 36 *Casuarina cunninghamiana* (River Oak) is a semi mature tree located on site with a 'TreeAZ' rating of 'A' and a 40+yrs life expectancy. The tree is located immediately adjacent to the proposed development envelope with an excessive encroachment therefore it is proposed for removal.
- 6.3.4.10 Tree no. 41 *Eucalyptus fibrosa* (Broad-leaved Ironbark) is dead

#### 6.3.5 Trees with no proposed TPZ Encroachments

- Tree no. 38 *Casuarina cunninghamiana* (River Oak)
- Tree no. 39 *Casuarina cunninghamiana* (River Oak)
- Tree no. 40 *Eucalyptus microcorys* (Tallowwood)

## 7 Tree Protection Measures

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

### 7.1 Tree Protection

**7.1.1 All tree parts must be protected** - This includes roots, trunks and branches.

**7.1.2 Trunk Protection** - If working within TPZ, trunk protection shall consist of hessian or padding wrapped around the trunk, two metre lengths of timber (100 x 50mm) spaced at 100-150mm centres secured together with 2mm galvanised wire. These shall be strapped around the trunk and not fixed to the tree in any way to avoid mechanical injury or damage.

**7.1.3 Fencing** - A 1.8m chain wire fence with concrete footings placed in accordance to tree protection zones and AS 4687. The TPZ distances are located within the tree schedule.

**7.1.4 Signage** - "Tree Protection Zone, No Entry". With project arborist contact details to be attached to the protective fencing.

**7.1.5 Machinery Movements** - When machinery movements are required within the TPZ then a geotextile permeable membrane to be laid under mulch or crushed rock under rumble boards must be in place.

**7.1.6 Foot Traffic** - Raised platforms using scaffolding and boards or similar must be constructed if foot traffic occurs within TPZ. Scaffold with boards is sufficient.

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

- machine excavation including trenching;
- excavation for silt fencing;
- cultivation;
- storage;
- preparation of chemicals, including preparation of cement products;
- parking of vehicles and plant;
- refuelling;
- dumping of waste;
- wash down and cleaning of equipment;
- placement of fill;
- lighting of fires;
- soil level changes;
- temporary or permanent installation of utilities and signs, and
- physical damage to the tree.

**7.1.8 Scaffolding** - All construction scaffolding must be erected around all branches not approved for pruning/removal.

7.1.9 **Pruning** - Remove of all dead stubs and failed branches leaving a clean cut with no splinters or pieces of wood that may prevent wound wood closure. This will enable wound wood development and reduce the risk of fungal infection. Any pruning required must be in accordance with AS 4373-2007 *Pruning of Amenity Trees*, Standards Australia and completed by level 3 qualified arborist or higher. Climbing spikes **MUST NOT** be used.

7.1.10 **Mulch** - Within the TPZ fencing 75mm 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*.

7.1.11 **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. Install irrigation lines at 450mm centres, forward-facing sprayers from the TPZ fence line for use during and post construction activities.

7.1.12 **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.

#### 7.1.13 Tree Monitoring Schedule

- During site occupation all TPZ's and trees must be monitored, assessed and recorded by the project arborist according to council's determinations.
- Any work that must occur within a TPZ must be witnessed and directed by the project arborist
- 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.

## 7.2 Excavation Within Tree Protection Zones

### 7.2.1 Monitoring

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

### 7.2.2 Root Pruning

- Roots measuring over 40mm in diameter must **not** be pruned within the Structural Root Zone unless directed by the project arborist ONLY.
- Roots measuring over 40mm in diameter within the Tree Protection Zone and outside the Structural Root Zone may be pruned at the discretion of the project arborist.
- Root exposure must be applied with hand tools or Air Spade to prevent damage to the root system.
- Root pruning can be performed by a level 3 arborist or higher.

- All 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.
- Bolt or wire cutters must not be used for root pruning.

### 7.2.3 Root Care

- Any roots exposed must be wrapped or covered with hessian or cloth and kept moist to prevent drying out and sunburn until backfilling occurs.
- Backfill must be watered in and mulched with composted leaf mulch.

## 7.3 Project Arborist Monitoring

|   |   |
|---|---|
| 1 | Project arborist (level 5) must oversee tree retention  |
| 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 monthly log including site visits, notes and photographs.          |
| 5 | Project arborist must provide feedback the builder / site manager / council.                        |

Table 4 Project Arborist Monitoring

## 7.1 Project Arborist Hold Points

| Hold Point | Task  | Timing                                   | Certification    |
|------------|---|--|------------------|
| 1          | Appoint project arborist to ensure protection of trees              | Prior to demolition of structures        | Project Arborist |
| 2          | Tree Protection Plan be onsite prior to works (Sect 5, AS4970-2009) |  |                  |
| 3          | Inspect Tree Protection Fencing with signage. (App C, AS4970-2009)  | Prior to demolition of structures        |                  |
| 4          | Supervise all work within any TPZ's                                 | As required prior to works proceeding    |                  |
| 5          | Install Trunk Protection where applicable (Sect 7.2.)               |  |                  |
| 6          | Tree Inspection   | Bi-monthly during all construction works |                  |
| 7          | Final Tree Inspection   | Post construction                        |                  |

Table 5 Project Arborist Hold Points

## Appendix A - Tree Schedule

| Tree no.            | 1                                       | 2                                       | 3                                       | 4                                       | 5                                       |
|---------------------|---|---|---|---|---|
| Species             | Corymbia gummifera (Red Bloodwood)      | Corymbia citriodora (Lemon-scented Gum) | Corymbia maculata (Spotted Gum)         | Eucalyptus microcorys (Tallowwood)      | Corymbia maculata (Spotted Gum)         |
| DBH                 | 60cm                                    | 45cm                                    | 50cm                                    | 60cm                                    | 60cm                                    |
| DGL                 | 70cm                                    | 50cm                                    | 55cm                                    | 65cm                                    | 70cm                                    |
| Height              | 15m                                     |   | 16m                                     | 14m                                     | 16m                                     |
| Canopy              | 13m                                     | 15m                                     | 12m                                     | 12m                                     | 14m                                     |
| Age                 | mature                                  | mature                                  | mature                                  | mature                                  | mature                                  |
| Life Expectancy     | 40+yrs                                  | 40+yrs                                  | 40+yrs                                  | 40+yrs                                  | 40+yrs                                  |
| Crown Class         | dominant                                | dominant                                | dominant                                | dominant                                | dominant                                |
| Crown Condition     | good (4)                                | good (4)                                | good (4)                                | good (4)                                | good (4)                                |
| Type                | native                                  | native                                  | native                                  | native                                  | native                                  |
| Health & Condition  |   |   |   |   |   |
| TPO Protected       | Yes                                     | Yes                                     | Yes                                     | Yes                                     | Yes                                     |
| TreeAZ              | A                                       | A                                       | A                                       | A                                       | A                                       |
| TPZ                 | 7.2m                                    | 5.4m                                    | 6.0m                                    | 7.2m                                    | 7.2m                                    |
| SRZ                 | 2.8m                                    | 2.5m                                    | 2.6m                                    | 2.8m                                    | 2.8m                                    |
| Prop Works Comments | pedestrian walkway                      | no works                                | no works                                | no works                                | no works                                |
| Prop Works Encr     | 16.6%                                   | 0.0%                                    | 0.0%                                    | 0.0%                                    | 0.0%                                    |
| Proposed Status     | Retain                                  | Retain                                  | Retain                                  | Retain                                  | Retain                                  |
|                     |   |   |   |   |   |
| Tree no.            | 6                                       | 7                                       | 8                                       | 9                                       | 10                                      |
| Species             | Corymbia citriodora (Lemon-scented Gum) | Corymbia citriodora (Lemon-scented Gum) | Corymbia citriodora (Lemon-scented Gum) | Corymbia citriodora (Lemon-scented Gum) | Corymbia citriodora (Lemon-scented Gum) |
| DBH                 | 30cm                                    | 40cm                                    | 35cm                                    | 35cm                                    | 25cm                                    |
| DGL                 | 40cm                                    | 50cm                                    | 40cm                                    | 40cm                                    | 35cm                                    |
| Height              | 14m                                     | 14m                                     | 12m                                     | 15m                                     | 8m                                      |
| Canopy              | 6m                                      | 7m                                      | 7m                                      | 7m                                      | 7m                                      |
| Age                 | young                                   | semi mature                             | young                                   | young                                   | young                                   |
| Life Expectancy     | 15-40yrs                                | 40+yrs                                  | 15-40yrs                                | 40+yrs                                  | 40+yrs                                  |
| Crown Class         | dominant                                | dominant                                | codominant                              | dominant                                | dominant                                |
| Crown Condition     | low (2-3)                               | good (4)                                | average (3)                             | average (3)                             | average (3)                             |
| Type                | native                                  | native                                  | native                                  | native                                  | native                                  |
| Health & Condition  |   |   |   |   |   |
| TPO Protected       | Yes                                     | Yes                                     | Yes                                     | Yes                                     | Yes                                     |
| TreeAZ              | Z1                                      | A                                       | A                                       | A                                       | Z1                                      |
| TPZ                 | 3.6m                                    | 4.8m                                    | 4.2m                                    | 4.2m                                    | 3.0m                                    |
| SRZ                 | 2.3m                                    | 2.5m                                    | 2.3m                                    | 2.3m                                    | 2.1m                                    |
| Prop Works Comments | no works                                | building                                | no works                                | no works                                | no works                                |
| Prop Works Encr     | 0.0%                                    | 2.6%                                    | 0.0%                                    | 0.0%                                    | 0.0%                                    |
| Proposed Status     | Retain                                  | Retain                                  | Retain                                  | Retain                                  | Retain                                  |



| Tree no.                      | 11                                    | 12                                   | 13                                   | 14                                   | 15                                   |
|-------------------------------|---------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| <b>Species</b>                | Eucalyptus paniculata (Grey Ironbark) | Eucalyptus saligna (Sydney Blue Gum) | Eucalyptus microcorys (Tallowwood)   | Eucalyptus microcorys (Tallowwood)   | Casuarina cunninghamiana (River Oak) |
| <b>DBH</b>                    | 57cm                                  | 70cm                                 | 70cm                                 | 60cm                                 | 55cm                                 |
| <b>DGL</b>                    | 50cm                                  | 80cm                                 | 80cm                                 | 65cm                                 | 65cm                                 |
| <b>Height</b>                 | 10m                                   | 15m                                  | 15m                                  | 15m                                  | 12m                                  |
| <b>Canopy</b>                 | 14m                                   | 20m                                  | 20m                                  | 10m                                  | 9m                                   |
| <b>Age</b>                    | mature                                | mature                               | mature                               | mature                               | mature                               |
| <b>Life Expectancy</b>        | 40+yrs                                | 40+yrs                               | 40+yrs                               | 40+yrs                               | 40+yrs                               |
| <b>Crown Class</b>            | dominant                              | dominant                             | dominant                             | dominant                             | dominant                             |
| <b>Crown Condition</b>        | good (4)                              | good (4)                             | good (4)                             | average (3)                          | good (4)                             |
| <b>Type</b>                   | native                                | native                               | native                               | native                               | native                               |
| <b>Health &amp; Condition</b> |                                       |                                      |                                      |                                      |                                      |
| <b>TPO Protected</b>          | Yes                                   | Yes                                  | Yes                                  | Yes                                  | Yes                                  |
| <b>TreeAZ</b>                 | A                                     | A                                    | A                                    | A                                    | A                                    |
| <b>TPZ</b>                    | 6.8m                                  | 8.4m                                 | 8.4m                                 | 7.2m                                 | 6.6m                                 |
| <b>SRZ</b>                    | 2.5m                                  | 3.0m                                 | 3.0m                                 | 2.8m                                 | 2.8m                                 |
| <b>Prop Works Comments</b>    | road 3                                | road 3                               | no works                             | pedestrian walkway                   | pedestrian walkway                   |
| <b>Prop Works Encr</b>        | 100.0%                                | 100.0%                               | 0.0%                                 | 41.2%                                | 40.4%                                |
| <b>Proposed Status</b>        | Remove                                | Remove                               | Retain                               | Retain                               | Retain                               |
|                               |                                       |                                      |                                      |                                      |                                      |
| Tree no.                      | 16                                    | 17                                   | 18                                   | 19                                   | 20                                   |
| <b>Species</b>                | Eucalyptus moluccana (Grey Box)       | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) |
| <b>DBH</b>                    | 70cm                                  | 65cm                                 | 70cm                                 | 50cm                                 | 45cm                                 |
| <b>DGL</b>                    | 70cm                                  | 70cm                                 | 70cm                                 | 60cm                                 | 50cm                                 |
| <b>Height</b>                 | 14m                                   | 12m                                  | 14m                                  | 13m                                  | 12m                                  |
| <b>Canopy</b>                 | 12m                                   | 13m                                  | 19m                                  | 8m                                   | 7m                                   |
| <b>Age</b>                    | mature                                | mature                               | mature                               | mature                               | semi mature                          |
| <b>Life Expectancy</b>        | 40+yrs                                | 40+yrs                               | 40+yrs                               | 40+yrs                               | 15-40yrs                             |
| <b>Crown Class</b>            | dominant                              | dominant                             | dominant                             | codominant                           | codominant                           |
| <b>Crown Condition</b>        | good (4)                              | good (4)                             | good (4)                             | average (3)                          | low (2-3)                            |
| <b>Type</b>                   | indigenous                            | native                               | native                               | native                               | native                               |
| <b>Health &amp; Condition</b> |                                       |                                      |                                      |                                      |                                      |
| <b>TPO Protected</b>          | Yes                                   | Yes                                  | Yes                                  | Yes                                  | Yes                                  |
| <b>TreeAZ</b>                 | A                                     | A                                    | A                                    | A                                    | A                                    |
| <b>TPZ</b>                    | 8.4m                                  | 7.8m                                 | 8.4m                                 | 6.0m                                 | 5.4m                                 |
| <b>SRZ</b>                    | 2.8m                                  | 2.8m                                 | 2.8m                                 | 2.7m                                 | 2.5m                                 |
| <b>Prop Works Comments</b>    | pedestrian walkway                    | pedestrian walkway                   | road 1                               | road 1                               | road 1                               |
| <b>Prop Works Encr</b>        | 35.0%                                 | 24.6%                                | 100.0%                               | 100.0%                               | 100.0%                               |
| <b>Proposed Status</b>        | Retain                                | Retain                               | Remove                               | Remove                               | Remove                               |

| Tree no.                      | 21                                   | 22                                   | 23                                   | 24                                   | 25                                   |
|-------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| <b>Species</b>                | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) |
| <b>DBH</b>                    | 50cm                                 | 50cm                                 | 45cm                                 | 55cm                                 | 50cm                                 |
| <b>DGL</b>                    | 60cm                                 | 65cm                                 | 55cm                                 | 65cm                                 | 60cm                                 |
| <b>Height</b>                 | 10m                                  | 8m                                   | 8m                                   | 13m                                  | 14m                                  |
| <b>Canopy</b>                 | 8m                                   | 8m                                   | 8m                                   | 10m                                  | 8m                                   |
| <b>Age</b>                    | mature                               | mature                               | mature                               | mature                               | mature                               |
| <b>Life Expectancy</b>        | 40+yrs                               | 40+yrs                               | 40+yrs                               | 40+yrs                               | 40+yrs                               |
| <b>Crown Class</b>            | dominant                             | dominant                             | dominant                             | dominant                             | dominant                             |
| <b>Crown Condition</b>        | good (4)                             | average (3)                          | average (3)                          | average (3)                          | average (3)                          |
| <b>Type</b>                   | native                               | native                               | native                               | native                               | native                               |
| <b>Health &amp; Condition</b> |                                      | DL BI SK                             | Branch inclusions                    |                                      |                                      |
| <b>TPO Protected</b>          | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |
| <b>TreeAZ</b>                 | A                                    | A                                    | A                                    | A                                    | A                                    |
| <b>TPZ</b>                    | 6.0m                                 | 6.0m                                 | 5.4m                                 | 6.6m                                 | 6.0m                                 |
| <b>SRZ</b>                    | 2.7m                                 | 2.8m                                 | 2.6m                                 | 2.8m                                 | 2.7m                                 |
| <b>Prop Works Comments</b>    | RACF entry                           | RACF entry                           | RACF entry                           | RACF entry                           | building                             |
| <b>Prop Works Encr</b>        | 100.0%                               | 100.0%                               | 100.0%                               | 100.0%                               | 7.2%                                 |
| <b>Proposed Status</b>        | Remove                               | Remove                               | Remove                               | Remove                               | Retain                               |
|                               |                                      |                                      |                                      |                                      |                                      |
| Tree no.                      | 26                                   | 27                                   | 28                                   | 29                                   | 30                                   |
| <b>Species</b>                | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Pinus radiata (Monterey Pine)        | Pinus radiata (Monterey Pine)        |
| <b>DBH</b>                    | 50cm                                 | 45cm                                 | 50cm                                 | 55cm                                 | 55cm                                 |
| <b>DGL</b>                    | 60cm                                 | 50cm                                 | 60cm                                 | 55cm                                 | 55cm                                 |
| <b>Height</b>                 | 9m                                   | 7m                                   | 14m                                  | 9m                                   | 10m                                  |
| <b>Canopy</b>                 | 9m                                   | 9m                                   | 10m                                  | 12m                                  | 10m                                  |
| <b>Age</b>                    | mature                               | mature                               | mature                               | mature                               | mature                               |
| <b>Life Expectancy</b>        | 40+yrs                               | 40+yrs                               | 40+yrs                               | 15-40yrs                             | 15-40yrs                             |
| <b>Crown Class</b>            | dominant                             | dominant                             | dominant                             | dominant                             | dominant                             |
| <b>Crown Condition</b>        | good (4)                             | good (4)                             | good (4)                             | average (3)                          | average (3)                          |
| <b>Type</b>                   | native                               | native                               | native                               | exotic                               | exotic                               |
| <b>Health &amp; Condition</b> |                                      |                                      |                                      |                                      |                                      |
| <b>TPO Protected</b>          | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |
| <b>TreeAZ</b>                 | A                                    | A                                    | A                                    | A                                    | A                                    |
| <b>TPZ</b>                    | 6.0m                                 | 5.4m                                 | 6.0m                                 | 6.6m                                 | 6.6m                                 |
| <b>SRZ</b>                    | 2.7m                                 | 2.5m                                 | 2.7m                                 | 2.6m                                 | 2.6m                                 |
| <b>Prop Works Comments</b>    | no works                             | no works                             | building                             | building                             | building                             |
| <b>Prop Works Encr</b>        | 0.0%                                 | 0.0%                                 | 14.2%                                | 40.4%                                | 40.4%                                |
| <b>Proposed Status</b>        | Retain                               | Retain                               | Remove                               | Remove                               | Remove                               |

| Tree no.            | 31                                   | 32                                   | 33                                   | 34                                   | 35                                   |
|---------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Species             | Grevillea robusta (Silky Oak)        | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) |
| DBH                 | 40cm                                 | 30cm                                 | 50cm                                 | 50cm                                 | 40cm                                 |
| DGL                 | 45cm                                 | 40cm                                 | 50cm                                 | 55cm                                 | 50cm                                 |
| Height              | 8m                                   | 7m                                   | 9m                                   | 9m                                   | 9m                                   |
| Canopy              | 9m                                   | 5m                                   | 7m                                   | 19m                                  | 8m                                   |
| Age                 | semi mature                          | young                                | semi mature                          | semi mature                          | semi mature                          |
| Life Expectancy     | 15-40yrs                             | 15-40yrs                             | 15-40yrs                             | 15-40yrs                             | 40+yrs                               |
| Crown Class         | dominant                             | dominant                             | dominant                             | dominant                             | dominant                             |
| Crown Condition     | average (3)                          | average (3)                          | average (3)                          | average (3)                          | average (3)                          |
| Type                | native                               | native                               | native                               | native                               | native                               |
| Health & Condition  | SI BI                                |                                      |                                      |                                      |                                      |
| TPO Protected       | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |
| TreeAZ              | A                                    | A                                    | A                                    | A                                    | A                                    |
| TPZ                 | 4.8m                                 | 3.6m                                 | 6.0m                                 | 6.0m                                 | 4.8m                                 |
| SRZ                 | 2.4m                                 | 2.3m                                 | 2.5m                                 | 2.6m                                 | 2.5m                                 |
| Prop Works Comments | pedestrian walkway                   | building                             | building                             | building                             | building                             |
| Prop Works Encr     | 18.4%                                | 16.6%                                | 29.2%                                | 24.3%                                | 30.4%                                |
| Proposed Status     | Remove                               | Remove                               | Remove                               | Remove                               | Remove                               |
|                     |                                      |                                      |                                      |                                      |                                      |
| Tree no.            | 36                                   | 37                                   | 38                                   | 39                                   | 40                                   |
| Species             | Casuarina cunninghamiana (River Oak) | Grevillea robusta (Silky Oak)        | Casuarina cunninghamiana (River Oak) | Casuarina cunninghamiana (River Oak) | Eucalyptus microcorys (Tallowwood)   |
| DBH                 | 45cm                                 | 45cm                                 | 45cm                                 | 45cm                                 | 60cm                                 |
| DGL                 | 50cm                                 | 50cm                                 | 50cm                                 | 50cm                                 | 65cm                                 |
| Height              | 10m                                  | 12m                                  | 8m                                   | 8m                                   | 13m                                  |
| Canopy              | 8m                                   | 10m                                  | 7m                                   | 7m                                   | 15m                                  |
| Age                 | semi mature                          | semi mature                          | semi mature                          | semi mature                          | mature                               |
| Life Expectancy     | 40+yrs                               | 40+yrs                               | 40+yrs                               | 40+yrs                               | 40+yrs                               |
| Crown Class         | dominant                             | dominant                             | dominant                             | dominant                             | dominant                             |
| Crown Condition     | average (3)                          | average (3)                          | average (3)                          | average (3)                          | average (3)                          |
| Type                | native                               | native                               | native                               | native                               | native                               |
| Health & Condition  |                                      |                                      |                                      |                                      | Branch inclusions                    |
| TPO Protected       | Yes                                  | Yes                                  | Yes                                  | Yes                                  | Yes                                  |
| TreeAZ              | A                                    | A                                    | A                                    | A                                    | A                                    |
| TPZ                 | 5.4m                                 | 5.4m                                 | 5.4m                                 | 5.4m                                 | 7.2m                                 |
| SRZ                 | 2.5m                                 | 2.5m                                 | 2.5m                                 | 2.5m                                 | 2.8m                                 |
| Prop Works Comments | building                             |                                      | no works                             | no works                             | no works                             |
| Prop Works Encr     | 32.6%                                | 0.0%                                 | 0.0%                                 | 0.0%                                 | 0.0%                                 |
| Proposed Status     | Remove                               | Retain                               | Remove                               | Remove                               | Remove                               |

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|                               |  |
|-------------------------------|--|
| <b>Tree no.</b>               | <b>41</b>                                  |
| <b>Species</b>                | Eucalyptus fibrosa (Broad-leaved Ironbark) |
| <b>DBH</b>                    | 60cm                                       |
| <b>DGL</b>                    | 65cm                                       |
| <b>Height</b>                 | 13m  |
| <b>Canopy</b>                 | 15m  |
| <b>Age</b>                    | mature                                     |
| <b>Life Expectancy</b>        | Dead                                       |
| <b>Crown Class</b>            | dominant                                   |
| <b>Crown Condition</b>        | dead                                       |
| <b>Type</b>                   | indigenous                                 |
| <b>Health &amp; Condition</b> | Dead                                       |
| <b>TPO Protected</b>          | No   |
| <b>TreeAZ</b>                 | Z  |
| <b>TPZ</b>                    | 7.2m                                       |
| <b>SRZ</b>                    | 2.8m                                       |
| <b>Prop Works Comments</b>    |  |
| <b>Prop Works Encr</b>        | 0.0%                                       |
| <b>Proposed Status</b>        | Remove                                     |

## Appendix B - Tree Schedule Definitions & Information

|                            |  |  |   |                          |
|----------------------------|--|--|---|--------------------------|
| Dimensions                 | Diameter at breast height (1.4m) (mm) DBH<br>Diameter at ground level (mm) DGL<br>Approximate height x canopy spread (m) H x C |  |   |                          |
| Age Class                  | Sapling<br>Mature  | Young<br>Over mature   | Semi mature<br>Senescent                              |                          |
| Life Expectancy            | >5 years   | 5-15 years   | 15-40 years   | 40+ years                |
| Crown Class                | Dominant<br>Co-dominant<br><br>Intermediate<br><br>Suppressed<br>Dead  | Crown extends above general canopy; not restricted by other trees.<br>Crown forms the bulk of the general canopy but crowded by other trees.<br>Crown extends into dominant/ co dominant canopy but quite crowded on all sides.<br>Crown development restricted from overgrowing trees.<br>Dead Tree |   |                          |
| Crown Condition / Vitality | 1 Severe decline<br>2 Declining<br>3 Average / low vigour<br>4 Good<br>5 Excellent   | <20% canopy density; major dead wood<br>20-60% canopy density; twig and branch dieback<br>60-90% canopy density; twig dieback<br>90-100% canopy density; little or no dieback or other problems<br>100% canopy density; no deadwood or other problems  |   |                          |
| Location                   | Adjoining - Nature Strip   | On Site  |   | Adjoining Property       |
| 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.   |   |                          |
| Ecological Value           | Branch Hollow<br>Nest / Drey<br>Wildlife Sighted   | Food Source<br>Scats<br>Endangered Ecological Community  |   | Markings<br>Trunk Hollow |
| Root Zone                  | Compaction<br>Garden<br>Grass  | Kerb<br>Lifting Pavement<br>Mulched  | Paving etc<br>Soil level lowered<br>Soil level raised |                          |
| Structures                 | Fence<br>Garage  | Footpath<br>Verandah   | Dwelling<br>Road                                      | Driveway<br>Seat         |

## Appendix C - Thumbnail Photographs





















## Appendix E - Tree Protection Plan





## Appendix F - Glossary

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

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

|                              |  |
|------------------------------|--|
| <b>Bark*</b>                 | All tissue outside the vascular cambium. Bark is usually divided into inner bark active phloem and aging and dead crushed phloem.  |
| <b>Basal</b>                 | Lower trunk area of the tree.  |
| <b>Branch*</b>               | Organ which supports leaves, flowers and fruit.  |
| <b>Branch collar*</b>        | 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.                 |
| <b>Canopy</b>                | The part of the crown composed of the leaves and small twigs.  |
| <b>Cavity</b>                | An open wound, characterized by the presence of decay and resulting in a hollow (Matheny & Clarke, 1994).  |
| <b>Codominant stems*</b>     | Stems or trunks of about the same size originating from the same position from the main stem.  |
| <b>Compaction</b>            | Compaction of soils causes roots to die due to lack of oxygen and water.   |
| <b>Compartmentalization*</b> | Dynamic tree defense process involving protection features that resist the spread of pathogens.  |
| <b>Crown*</b>                | Portion of the tree consisting of branches and leaves and any part of the trunk from which branches arise.   |
| <b>Decay*</b>                | Degeneration and delignification of plant tissue, including wood, by pathogens or microorganisms.  |
| <b>Dieback</b>               | Dieback is the reduction in the dynamic mass of a tree as twigs and branches die and are walled off by protection boundaries.  |
| <b>Epicormic shoots*</b>     | 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.                                 |
| <b>Included bark*</b>        | Inwardly formed bark at the junction of branches or codominant stems.  |
| <b>Kino</b>                  | 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.   |
| <b>Lopping*</b>              | Random cutting of branches or stems between branch union or at internodes on young trees.  |
| <b>Mycorrhiza</b>            | A symbiotic, nonpathogenic, 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. |
| <b>Microorganisms</b>        | An organism of microscopic size. Bacteria, the tree pathogens, may be as small as 3 microns wide by 5 microns long.  |
| <b>Pathogen</b>              | Any agent that causes disease.   |
| <b>Photosynthesis</b>        | A process where chlorophyll in plants traps the energy of the sun in a molecule of carbon dioxide and water that is called sugar.  |
| <b>Roots</b>                 | 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.   |
| <b>Stem*</b>                 | Organ which supports branches, leaves flowers and fruit.   |
| <b>Tree*</b>                 | Long lived woody perennial plant greater than (or potentially greater than) 3m in height with one or relatively few stems.   |
| <b>Trunk*</b>                | The main stem.   |
| <b>Wound*</b>                | An opening that is created when the bark is cut, removed or injured.   |

## Appendix G - TreeAZ (Barrell 2016)

### TreeAZ Field Sheet

**Heritage:** Each tree is assessed by a visual check. If it is a designated heritage tree, then it is automatically categorized as AA, and is not subjected to any of the category ZZ, Z or A considerations.

**Category ZZ (unsuitable for retention):** Any remaining trees that are severely compromised and unsuitable for retention, even short term, are categorized as ZZ, i.e. Dead; irreversibly declining health; irremediable structural conditions; or, causing severe inconvenience to people or structural damage.

**Category Z (low quality):** Any remaining trees are systematically reviewed to decide if they fit into any of the four Z subcategory groups listed in the table below.

**Category A (moderate quality):** Any remaining trees are automatically category A, with the possibility of being promoted to category AA.

**Category AA (high quality):** If a category A tree is already Large, or has the potential to become so with limited intervention, it can be promoted to category AA, at the discretion of the assessor.

#### Category Z: Low quality 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   | Size: Young or insignificant small trees, e.g. below the local size threshold for legal protection, etc   |
|   | 2   | Proximity, hedge or species: Exempt from legal protection because of proximity to structures, a maintained hedge or unsuitable species, e.g. scheduled noxious weed, out of character in a setting of acknowledged importance, etc      |
|   | Deteriorating health/condition: Trees that are likely to be removed within 10 years because of deteriorating health and/or structural condition |   |
|   | 3   | Health: Deteriorating health with little realistic prospect of recovery   |
|   | 4   | Crown instability: Deteriorating structural conditions where an increasing risk of failure can be temporarily addressed by reasonable intervention, e.g. storm damage, cavities, decay, included bark, wounds, excessive imbalance, etc |
|   | 5   | Root instability: Deteriorating whole tree stability through poor anchorage, increased exposure to weather, etc   |
|   | Ongoing nuisance: Trees that are likely to be removed within 10 years because of unsuitable impact on people                                    |   |
|   | 6   | Inconvenience: Ongoing and increasing inconvenience to residents to the extent that a locally recognised court or tribunal would be likely to authorise removal, e.g. dominance, debris, interference, etc                              |
|   | 7   | Damage: Ongoing and increasing structural damage to property to the extent that a locally recognised court or tribunal would be likely to authorise removal, e.g. worsening damage to surfacing and structures, etc                     |
|   | Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population                      |   |
|   | 8   | No future potential: Poor condition or location with no realistic potential for recovery or improvement, e.g. dominated by adjacent trees or buildings, poor architectural framework, etc   |
|   | 9   | Benefit nearby trees: Removal would benefit better adjacent trees, e.g. relieve physical interference, suppression, etc   |
|   | 10  | Maintenance costs: Unacceptably high maintenance costs, e.g. structural conditions requiring high levels of regular pruning, etc  |

NOTE: 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

#### Categories A and AA: Moderate and high quality trees suitable for retention for more than 10 years, and worthy of being a material constraint

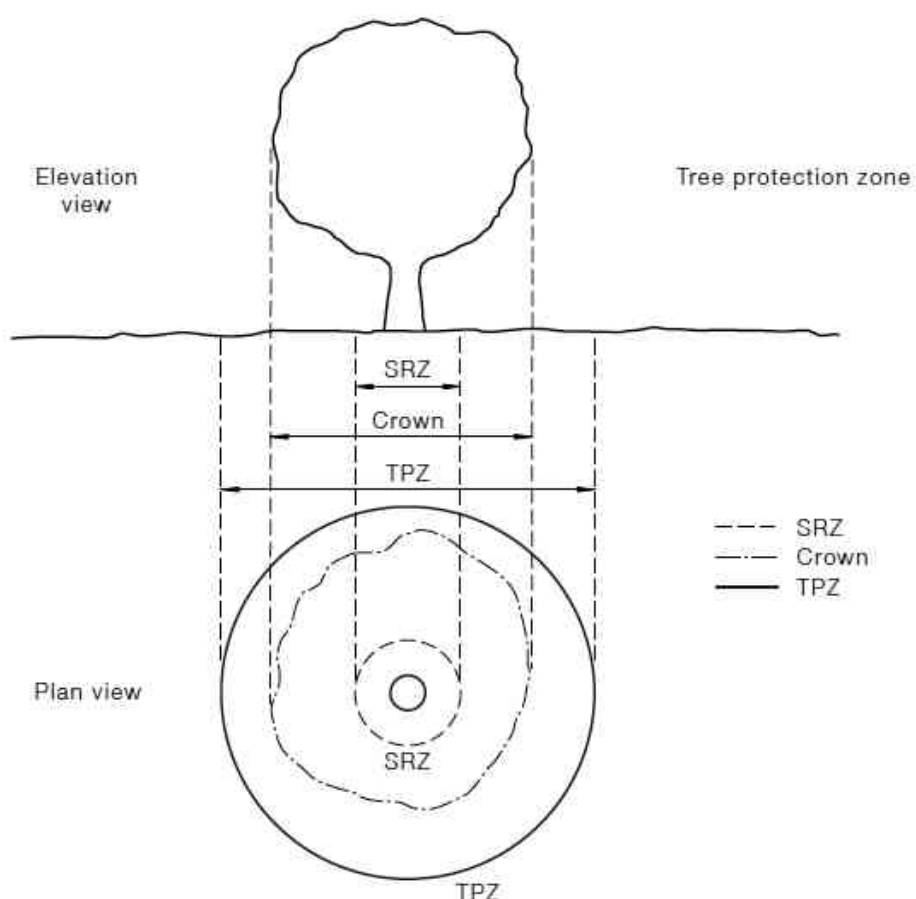
|  |  |  |
|--|--|--|
| A  | All trees that are not categories ZZ or Z that can be retained with limited intervention |  |
| NOTE: Category A trees that are already large, or have the potential to become so, with limited intervention, can be promoted to category AA(1), at the discretion of the assessor. Designated heritage trees are automatically category AA(2). Although all category AA and A trees are sufficiently important to be material constraints, category AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process. |  |  |
| AA   | 1  | Single category A trees or small groups which, at the discretion of assessor, can be promoted to category AA because they are already large, or have the potential to become large |
|  | 2  | Designated heritage tree   |

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## Appendix H - 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.

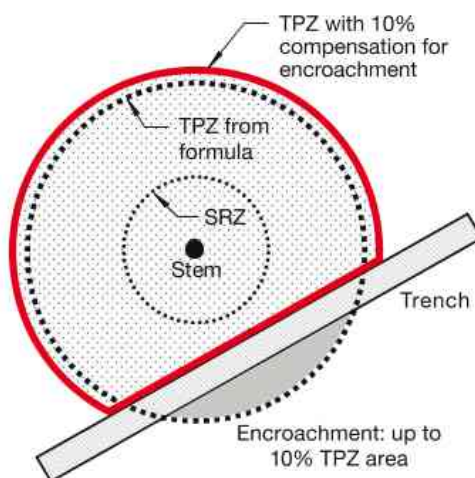
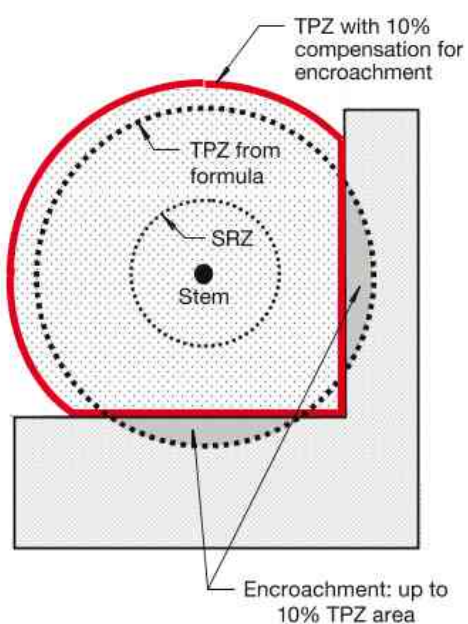
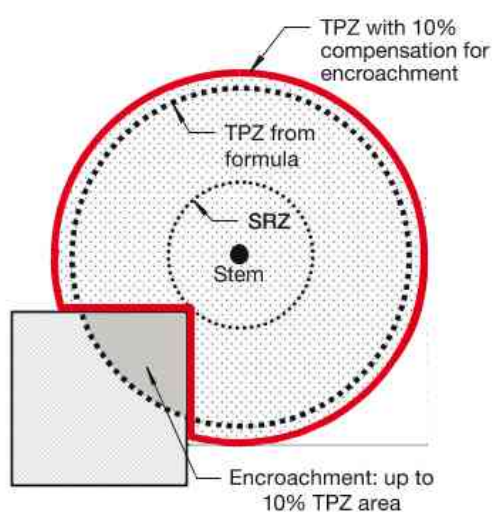
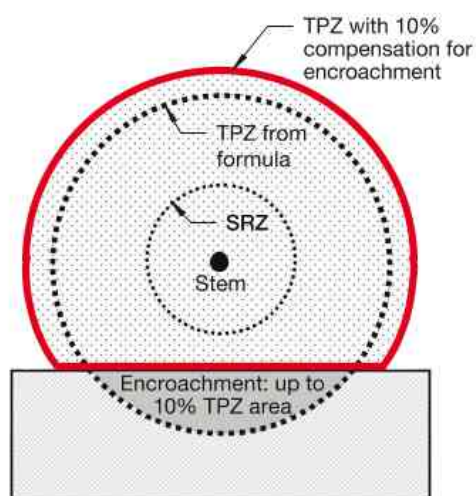
## Appendix I - Tree Protection Zone Encroachments AS4970-2009

### 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 J - Qualifications & Experience

### Qualifications:

Advanced Certificate in Urban Horticulture, 1999  
 Horticulture Diploma (Arboriculture), Level 5 - 2002  
 Collecting Catchment Data 2010  
 Quantified Tree Risk Assessment 2011, 2014  
 ISA Tree Risk Assessment Qualification (TRAQ) 2015  
 Horticulture Diploma (Arboriculture), Level 5 - 2015  
 White Card Number 2234996 – 2018  
 Working with Children - WWC1945307E

### Practical experience:

Horticulturist, Nursery 1996 – 1998  
 Horticulturist, Gardening 1998 – 2001  
 Silver Springs Nursery (Owner/Operator) 1997  
 Australis Tree Management, Consulting Arborist (Owner/Operator) 2000

### Memberships and affiliations:

Arboricultural Association  
 Arboriculture Australia  
 Australian Institute of Horticulture  
 International Society of Arboriculture  
 Quantified Tree Risk Assessment Registered User  
 Burrendong Botanic Garden & Arboretum

### Insurance:

Professional Indemnity Insurance  
 Liberty International Underwriters  
 \$5,000,000.00  
 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





## Appendix K – 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.
- 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.
- Environmental Protection and Biodiversity Conservation Act* (1999)
- Fairley, A. & Moore, P. (1989) *Native Plants of the Sydney District*. Kangaroo Press, Kenthurst NSW Australia.
- 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.
- 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. Exponent 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 (2017) [www.nearmaps.com.au](http://www.nearmaps.com.au)
- NSW Government (2018) *Biodiversity Values Map*.  
<https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap> Visited 24 September 2019
- NSW Government Department of Primary Industries (2018) *NSW Weed Wise*. <http://weeds.dpi.nsw.gov.au> Visited 24 September 2019
- NSW Government (2018) *NSW Planning Portal*.  
<https://www.planningportal.nsw.gov.au/spatialviewer/#/find-a-property/address> Visited 24 September 2019
- NSW Government NSW Legislation (2018) *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017*. <https://www.legislation.nsw.gov.au/#/view/EPI/2017/454/part1/cl5> Visited 24 September 2019
- NSW Government Office of Environment & Heritage (2018) *Threatened Biodiversity Profile Search*  
<http://www.environment.nsw.gov.au/threatenedSpeciesApp/> Visited 24 September 2019
- NSW Government Office of Environment & Heritage (2018) *Search for NSW Heritage*  
<http://www.environment.nsw.gov.au/heritageapp/heritagesearch.aspx> Visited 24 September 2019
- NSW National Parks & Wildlife Service (1995) *Threatened Species Conservation Act*. NSW NPWS, Hurstville, NSW, Australia.



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State Environmental Planning Policy No 19 - Bushland in Urban Areas :(pub1986-10-24)

State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017: Subject Land :(pub2017-08-25)