

# **ABOUT TREES**

URBAN TREE & BUSHLAND MANAGEMENT

**DRAFT**

**PRELIMINARY**

**TREE SURVEY & REPORT**

**AT**

**40-46 EVAN ST & 96-98 LETHBRIDGE ST**

**PENRITH**

**FOR**

**MATTHEW FREEBURN**

**(FOR REVIEW PURPOSES ONLY)**

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# ABOUT TREES

## URBAN TREE AND BUSHLAND MANAGEMENT

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05/08/19  
Ref. # 2042

## 1.0 INTRODUCTION

A Development Application (DA) is to be lodged with Penrith City Council for consent for a new development at 40-46 Evan St & 96-98 Lethbridge St Penrith

### 1.1 Scope

This report has been commissioned by Mr. Matthew Freeburn and its purpose is to assess the health and condition of the subject trees, and provide an estimate of their safe life expectancies

### 1.2 Summary of Report

This preliminary tree survey and summary report has been prepared in accordance with Clause 5.9 of Penrith LEP 2010 to allow the siting and layout of the proposed development to consider, at the initial concept stage, the location of trees and other vegetation and favour their retention.

This has been achieved by

- A summary of the Retention Values of the trees that is provided in Section 4.5
- An estimate of their Safe Live Expectancies is provided in Section 4.6
- Their recommended Tree Protection Zones and Structural Root Zones, in accordance with AS 4970, are provided in the Tree Survey Sheets in Section 10

In my opinion, the Retention Value Assessment in Section 4.5 doesn't give adequate considerations to the negative attributes that an individual tree may have, or of its suitability for the location. For example. Tree No. 62 in this report is in good health, but poor structural condition, and is suitable for short term retention. Due to the large size of the defective part, I would recommended that a tree in this condition be removed as soon as practically possible

For this reason, I prefer and recommended the TreeA/Z Assessment, provided in Section 4.6 as it considers more structural issues that should be considered on a proposed development site.

#### 1.2.1 Trees considered unsuitable for retention

##### Exempt Species (invasive or noxious species)

The following trees are exempt from Clause 5.9 of Penrith LEP 2010

- Tree No's 2 – 7, 10 – 12, 41 – 46, 65, 69, 106, 107 & 109 – 114 are listed as exempt species, and Clause 5.9 of Penrith LEP 2010 does not apply
- Tree No. 108 (within 2m of a dwelling) and Clause 5.9 of Penrith LEP 2010 does not apply

##### Hazardous Trees:

The following tree were identified as being potentially hazardous

- **Tree No. 60 (*Corymbia citriodora*)** has significant dieback in its canopy and fruiting bodies of root decaying fungus on its root crown. The type of fungus was not identified, but another tree in close proximity (No. 18) has typical symptoms associated with Armillaria Root Decay (see additional information in Appendices 9.8)

- **Tree No. 61 (*Corymbia citriodora*)** has a two equal sized, codominant ascending branches at about 15m high on the main trunk. Staining along the trunk beneath this junction is a symptom of an internal crack, and it has a possible to imminent potential of failure (see Appendices 9.10 & 9.11)
- **Tree No. 62 (*Corymbia citriodora*)** has been heavily suppressed by the more dominant forms of No's 60 & 61. This has resulted in the formation of a significant asymmetrical canopy towards the northwest, and it will have a probable to imminent potential of failure if the more dominant trees are removed.

*'Trees that develop naturally with a lean may be as strong and stable as an upright tree due to the development of reaction wood and compensating root growth. Natural leans can develop in trees along the edge of a stand. Such trees are not prone to failure unless the adjacent trees are removed, exposing the leaning tree to unaccustomed wind stress'* (Matheny & Clarke 1991)

*'A sudden increase in exposure to wind is another factor that can lead to the failure of trunks and branches whose support has been provided partly by reaction wood. This problem often arises when neighbouring trees are felled, or when tall buildings are erected or demolished. In some cases, the neighbouring trees may have also provided direct physical support'* (Lonsdale 1999).

- **Tree No's 71 and 72 (*Corymbia citriodora*)** both have significant asymmetrical canopies, and their retention will be dependent on the retention of Tree No. 72. The removal of No. 72 will expose the edge type canopies of the remaining trees to uncustomed wind loading, and this will increase their failure potentials.
- **Tree No. 72 (*Corymbia citriodora*)** has formed a significant asymmetrical canopy towards the east, and most of its tall canopy overhangs a unit on No. Derby Street. The potential for a whole tree failure is considered unlikely at this stage, but the species is prone to Summer Branch Drop (Appendices 9.12)
- **Tree No's 80 & 81 (*Melaleuca quinquenervia*)** are semi-mature trees with ° leans towards the east. They are being supported by the change rooms within their driplines, and the proposed demolition of this building will result in probable to imminent failures
- **Tree No. 85 (*Liquidamber styraciflua*)** is a mature tree with a wide spreading canopy. Some of these branches are receiving mechanical support from the dwelling in its dripline, and the proposed demolition of this building will result in probable to imminent failures
- **Tree No. 92 (*Jacaranda mimosifolia*)** is an over-mature tree with two equal sized diameter, codominant ascending branches and a partially failed weak junction. This has a probable to imminent failure potential.

## Dead and declining trees

The following tree were identified as being dead or in decline

- **Tree No. 9 (*Cupressus sempervirens*)** is an over-mature hedgerow. They have typical symptoms associated with Cypress Canker, of which there is no effective control (see Appendices 9.7)
- **Tree No. 18 (*Eucalyptus moluccana*)** is in advanced stages of decline and has typical symptoms of Armillaria Root Decay (see Appendices 9.8)
- **Tree No's 21 (*Melaleuca quinquenervia*)** This tree is dead and is exempt from Clause 5.9 of Penrith LEP 2010
- **Tree No. 22 & 23 (*Melaleuca quinquenervia*)** have sparse foliage, and appear to be in declining health and vitality (see Appendices 9.9)
- **Tree No. 64 & 67 (*Grevillia robusta*)** are in advanced stages of decline, and treatment and or tree surgery techniques are unlikely to increase their safe life expectancies (see Appendices 9.9)

### Trees with poor structural forms and are unlikely to improve

- **Tree No's 19 & 20 (*Melaleuca quinquenervia*)** – these trees have suppressed asymmetrical forms that will become recently exposed edge-type trees after No's 18, 20 & 23 are removed
- **Tree No's 48, 51 & 52 (*Casuarina cunninghamiana*)** – these trees have very tall thin canopies, with canopies that lean out of the stand
- **Tree No's 66 & 68 (*Lophostemon conferta*)** – these trees have suppressed asymmetrical forms that will become recently exposed edge-type trees after No's 67, 69 & 70 are removed
- **Tree No's 100 & 101** – these trees have heavily suppressed, edge type canopies towards the north
- **Tree No's 102 – 104 (*Cinamomum camphora*)** – these are a codominant stand of trees that have originated from suckers on an old stump. They are unsuitable for long term retention

### 1.2.2 Tree considered suitable for retention

This assessment determined that Tree No's 1, 8, 13, 15 – 17, 24 – 40, 47, 49, 50, 53 – 59, 63, 73 – 79, 82 – 84, 87, 88 – 91, 93 – 97, & 117 – 121 have SULE Ratings of A1 – No significant defects and could be retained with minimal remedial care.

- **Low Amenity & Ecological Values:** Tree No's 1, 8, 13, 58, 87, 95, 98, 114 and 115 are suitable for long term retention, but have limited ecological and amenity values. Their proposed removals may be considered to be justified for design layout purposes.
- **Tree No. 16 (*Eucalyptus moluccana*)** has been heavily colonised by mistletoe, and this is often associated with an irreversible decline spiral of this species in the local area. Careful consideration should be given to the practicality of trying to retain this tree in the long term.
- **Boundary Screening:** Tree No's 15 (hedgerow), 53 – 57 (hedgerow) 76, 77, 96 & 97 provide screening along property boundaries. Tree No's 87 – 90 are located on No. Derby Street, and also provide boundary screening. A priority should be made to retain these trees.
- **Tree No's 117 – 121 (*Lophostemon conferta*)** – these are council owned street trees, and their safe life expectancies are unlikely to be compromised by the proposed development, if appropriate tree protection methods are utilised

### 1.3 Conclusions

- Tree No's 1, 8, 13, 15 – 17, 24 – 40, 47, 49, 50, 53 – 59, 63, 73 – 79, 82 – 84, 87, 88 – 91, 93 – 97, & 117 – 121 have SULE Ratings of A1 – No significant defects and could be retained with minimal remedial care.
- Tree No's 2, 9 – 12, 18 – 23 41 – 46, 48, 51, 52, 60 – 62, 64, 67, 69 – 72, 80 & 81, 85, 86, 92 & 98 - 114 are not considered suitable for retention.

### 1.4 Recommendations

- This preconstruction survey should be used as a basis to select trees to be retained within the proposed development.
- Trees scheduled to be retained should be shown on the proposed site plan, and their Tree Protection Zones and Structural Root Zones of each tree should be included
- This will assist in the preparation of any required Arboricultural Impact Assessment.

If you require any further information, please feel free to contact me on 0439 758 658.

Lawrie Smith,  
Arboricultural Consultant



## 2.4 Limitation of Liability

Trees are living organisms and do not remain static over time. Conditions are often hidden within trees and below ground. Unless it has been otherwise stated, observations have been made by eye and from ground level. Tree can be managed, but they cannot be controlled, and to live near a tree is to accept some degree of risk. The only way to eliminate all risks is to remove all trees.

Arborists cannot detect every condition that could possibly lead to the failure of a tree. They cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise remedial treatments, like any medicine, cannot be guaranteed.

Site changes, storms and ongoing growth can alter a tree over time; therefore, tree assessments must occur on a regular basis. Unless stated otherwise, this assessment cycle is based on an annual inspection. This is consistent with and the Land & Environment Courts definition of a tree that is 'likely to cause damage or injury in the near future' as 'likely to cause damage or injury within the next 12 months'.

It should also be noted that any opinions given by the Arborist in relation to the health, condition, desirability or significance of any tree will not necessarily coincide with the opinions of the relevant Council authority or their Tree Management Officers.

The author shall not be required to provide additional information, give testimony or attend Court by reason of this report unless subsequent contractual arrangements are made, including an additional fee for such services.

## 2.5 Uniform Civil Procedures Rules (2005)

In order to ensure the reliability of evidence provided by experts, the Courts have provided the Uniform Civil Procedures Rules 2005 (UCPR) and Land & Environment Court Rules 2007 (LECR).

The author of this report has read and understands the Expert Witness Code of Conduct in Schedule 7 to UCPR, and agrees to be bound by it in accordance with UCPR 31.23.

An expert is permitted to provide evidence before a Court in order to assist the Court draw inferences. The primary overriding duty of an expert is to assist the Court impartially on matters relevant to the expert witness's expertise. Any opinions expressed must be based on the persons training, study or expertise.

## 2.6 Copyright

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### 3.0 TREE LEGISLATION

#### 3.1 Penrith DCP 2014 – Vegetation Management

This section of the DCP seeks to address vegetation management in a holistic manner by considering the requirements for vegetation preservation and enhancement in terms of a number of different and sometimes competing objectives.

This includes protecting threatened species and their habitats, protecting other significant native vegetation and bushland, preserving significant non-native or introduced vegetation; and considering the impact of bushfires on life and property where buildings and vegetation interface.

Any proposed development or activity should address the objectives and controls in this section in a holistic manner

#### 3.2 General Objectives

- a. To adopt the principles of ecologically sustainable development (ESD) in protecting and enhancing Penrith's native vegetation;
- b. To preserve existing trees and vegetation for the benefits they provide;
- c. To preserve existing trees and vegetation, where possible, during the design, development and construction process and justify any tree or vegetation removal to Council;
- d. To protect and enhance native vegetation and biodiversity in the Penrith Local Government Area, including habitat for threatened species, populations and ecological communities and corridors for flora and fauna;
- e. To retain native vegetation in parcels of a size and configuration which will enable existing plant and animal communities to survive in the long term;
- f. To protect and enhance the landscape character and scenic qualities of the Penrith Local Government Area; and
- g. To manage the conflict between protecting and removing vegetation to address natural hazards such as bushfires.

#### 3.3 Preservation of Trees and Vegetation

There is a need to retain and protect trees and vegetation on both public and private land. However, conflicts between trees/vegetation and land uses/activities need to be managed. For this reason, this Plan provides controls for the preservation of trees and vegetation.

This section of the DCP seeks to reinforce and supplement the controls set out in Clause 5.9 Preservation of trees or vegetation of Penrith LEP 2010, which apply to the preservation of trees and vegetation in all areas of the City.

**Note:** The 'Development on natural resources sensitive land' clause in Penrith LEP 2010 and Section 2.2 Biodiversity Corridors and Areas of Remnant Indigenous Vegetation in Non-Urban Areas below contain additional provisions to protect and enhance biodiversity corridors and areas of remnant indigenous vegetation.

#### Objectives

- a. To prescribe which species or kinds of trees or other vegetation are protected by Clause 5.9 Preservation of trees or vegetation of Penrith LEP 2010 and this section of the Plan;
- b. To promote the benefits of trees and other vegetation;
- c. To protect and enhance native vegetation, habitat for native fauna and biodiversity;
- d. To protect and enhance native vegetation for its scenic values and to retain the unique visual identity of the landscape;
- e. To manage non-native vegetation in accordance with its cultural and landscape significance;
- f. To ensure that any new development takes into account existing vegetation in the site planning, design, development, construction and operation of the development; and
- g. To ensure there are mechanisms for the long term protection, management and maintenance of trees and vegetation.

### 3.4 Development Consent

- a. In accordance with Clause 5.9 of Penrith LEP 2010, a person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any tree or other vegetation which is prescribed by this Plan without development consent, or a permit granted by Council.

### 3.5 Prescribed Vegetation

- a. The prescribed trees or other vegetation that are protected by Clause 5.9 of Penrith LEP 2010 and this section of the Plan include:
- (i) Any indigenous tree (both living and dead) or other vegetation that is on land zoned E2 Environmental Conservation in the Penrith LEP 2010 Land Zoning Map or natural resources sensitive land identified in the Penrith LEP 2010 Natural Resources Sensitivity Land Map.
  - (ii) In residential areas, any tree or other vegetation having a height of 3m or more or a trunk diameter exceeding 100mm at 1400m above ground level.
  - (iii) In business and industrial areas:
    - Any tree or other vegetation having a height of 3m or more or a trunk diameter exceeding 100mm at 1400mm above ground level.
  - (iv) In rural areas:
    - Any tree or other vegetation, within 20m of a dwelling house, having a height of 3m or more or a trunk diameter exceeding 100mm at 1400mm above ground level.
    - Any indigenous tree or vegetation, not within 20m of a dwelling house. Note: clearing of vegetation will only be considered where it is proposed in conjunction with a use permissible on that land.
    - Any introduction vegetation, not within 20m of a dwelling house, having a height of 3m or more or a trunk diameter exceeding 100mm at 1400mm above ground level.
  - (v) Any tree or other vegetation that is, or forms part of, a heritage item or is within a heritage conservation area.
- b. Clause 5.9 of Penrith LEP 2010 and this section of the Plan do not apply to:
- (i) A tree or other vegetation that the Council is satisfied is dying or dead and is not required as the habitat for native fauna;
  - (ii) Tree or other vegetation that the Council is satisfied is a risk or imminent threat to human life or property;
  - (iii) A tree or other vegetation where the trunk is located within 2m of an existing dwelling, as measured from the main trunk of the tree or other vegetation to an external enclosing wall of the existing dwelling;
  - (iv) Remove or prune any exempt species
 

<i>Ailanthus altissima</i> (Tree of Heaven)	<i>Cotoneaster spp.</i> (Cotoneaster)
<i>Celtis sinensis</i> (Hackberry)	<i>Ficus elastica</i> (Rubber Tree)
<i>Lagunaria patersonia</i> (Norfolk Island Hibiscus)	<i>Ligustrum spp</i> (Privet)
<i>Nerium oleander</i> (Oleander)	<i>Olea africana</i> (African Olive)
<i>Schefflera actinophylla</i> (Umbrella Tree)	<i>Senna pendula</i> (Cassia)
<i>Syagrus romanzoffianum</i> (Cocos Palm)	
  - (v) A tree that is an edible fruit tree requiring annual pruning or is a tree within a timber plantation;
  - (vi) the pruning or removal of trees and other vegetation on Council owned or managed land provided the work is undertaken by persons authorised by Council, and is in accordance with Council approved works, a Council policy or a Plan of Management, AS 4373-2007 (Australian Standard – Pruning of Amenity Trees) and statutory approvals;
  - (vii) Action required or authorised to be done by or under the *Electricity Supply Act 1995*, the *Roads Act 1993* or the *Surveying and Spatial Information Act 2002*;
  - (viii) Controlled weeds under the NSW Biosecurity Act 2015 and identified in the Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022
  - (ix) The removal of trees and other vegetation to control declared pests under the *Local Land Services Act 2013*. (Species currently declared pests in NSW are wild rabbits, wild dogs, feral pigs and a number of locust species); and
  - (x) The removal of trees and other vegetation to maintain approved dams or asset protection zones.

- c. Where vegetation works (including tree removal) are proposed as part of other works on the site for which consent is required, the works then must be assessed as part of the Development Application.

### 3.6 Submission Requirements

- a. An application for development consent may require different levels of information, depending on:
- (i) The location and extent of the proposed works;
  - (ii) Whether the site contains any threatened species, population, ecological community or its habitat.

The level of information required to be submitted with the application will also depend on these factors.

- b. Applicants should consult with Council's Development Services Department or Tree Management Officer for advice

A species impact statement will be required if Council determines that the works are likely to have a significant effect on any threatened species, population or ecological community or its habitat. For some works, Council may require a report from a suitably qualified arborist.

Note: A Flora and Fauna Assessment report will be required for any Development Application for works to any indigenous trees and vegetation comprising 5 or more native trees with understorey or when there is the potential for Threatened Species or Endangered Ecological Communities to be present.

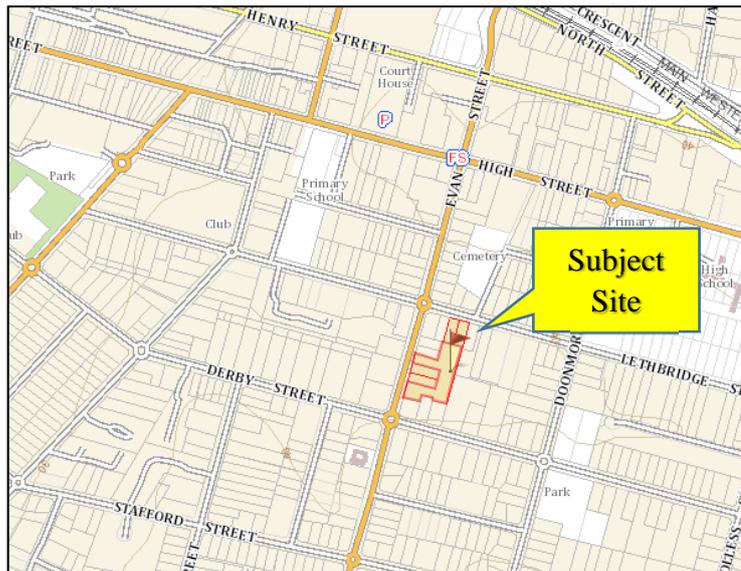
- c. A tree survey and assessment report should address the following matters:
- (i) The location and type of tree(s) or vegetation;
  - (ii) Details of the proposed works and the reasons for the works;
  - (iii) The health and condition of the tree(s) or vegetation, including its structural soundness and the condition of the root zone;
  - (iv) The aesthetic, scientific and/or historic importance of the tree(s) or vegetation;
  - (v) The impact of the proposed work on the appearance, health or stability of the tree(s) or vegetation and the general amenity of the surrounding area, including any effect on the streetscape;
  - (vi) In the case of an application to remove a tree(s) or vegetation, whether pruning would be a more practicable and desirable alternative;
  - (vii) The risk of personal injury;
  - (viii) The risk of damage to buildings, structures or services;
  - (ix) The extent of other trees and vegetation on the property;
  - (x) Whether the tree(s) or vegetation is habitat, a source of food or shelter, or used by fauna; and
  - (xi) Whether all alternatives to removing or pruning the tree or vegetation have been considered.
- d. In most cases, where works are proposed to any indigenous vegetation and require a development application, a flora and fauna assessment will be required. The report must be undertaken by a suitably qualified and experienced and must be prepared in accordance with the Threatened Species Assessment Guidelines – The Assessment of Significance for the Threatened Species Conservation Act (DECCW (OEH) 2007), the Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft) (DEC, 2004), and the Significant Impact Guidelines – Matters of National Environmental Significance for the EPBC Act (prepared by the Commonwealth Department of Environment, Water, Heritage and the Arts, 2013). This report must include the following as a minimum:
- (i) A written and mapped description of the plant and animal species present and their habitats;
  - (ii) A clear site plan showing, as a minimum, the proposed development and any associated Asset Protection Zone and Effluent Management Area, location of all vegetation, important site features and location of any vegetation to be removed.





## 4.0 OBSERVATIONS

4.1 The sites is known as 40 – 46 Evan Street & 96 – 98 Lethbridge Street Penrith and the surrounding areas are mainly comprised of urban residential development



Map 1 – showing location of subject site (Dept Lands 2019)



Map 2 – showing subject trees (Dept Lands 2019)

4.2 The soil of the general area has been described by Bannerman & Hazelton (1990), as ‘Luddenham Soil Landscape’. The top soil is usually 10cm of friable brownish dark brown loam which becomes hard setting when dry or compacted (lu1), and overlies 40cm of hardsetting brown clay loam, especially when exposed at the surface (lu2).

Where subsoil exits, >50cm of medium to heavy clay (lu3) over overlies <90cm of grey mottled clay (lu4). Soil is generally shallow on crests (<100cm), moderately deep on upper slopes (70 – 150cm) and moderately deep on lower slopes and drainage lines (<150cm). Subsoils have high clay content and are moderately reactive.

Reactive soils can cause surface movement as they shrink or swell in response to changes of their soil moisture content. This can cause extensive damage to pathways, paving, underground services and buildings with inappropriately designed footings.

### 4.3 Current Condition of the Tree/s

**Tree 1 is a mature *Lagerstroemia indica*; ‘Crepe Myrtle; a deciduous small tree to 6 – 8m tall, the trunk dividing 1 – 2m from the ground unless pruned otherwise, the main branches forming a vase-shaped crown growing to 5 – 6m wide at maturity.’ Rowell, R. 1980)**

- a. **Health & Vitality:** Average – this is a deciduous species and was dormant at the time of the inspection. However, an examination of the previous seasons of extension growth indicates that it’s generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 4).
- b. **Tree Form:** – it has formed multiple stems from the rootcrown and these combine to form a codominant canopy that is 7m in height, with a crown spread of 10x10m.
- c. **Structural Condition:** Average, retainable in the long term

**Tree No’s 2– 7 are a mature hedgerow of *Ligustrum lucidum*; ‘Large Leaf Privet is an evergreen small-tree to 6 – 10m tall, a large bush when young, but unless restricted by pruning, eventually tree-like with a distinct single trunk and conical, leafy crown; in old age, the head becomes broad-domed and umbrella-like to 8 – 10m wide. It has been used extensively in Australian gardens for hedging and screening, but escapees from cultivation have become one of the most serious threats to bushland in the Sydney Region (Rowell 1980)’ (Rowell, R. 1980)**

- a. This species is a ‘weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014 (see Plate 1).
- b. These trees should be removed

**Tree 8 is a mature *Archontophoenix alexandrae*:** ‘Alexander palm is an attractive plant native to the rainforests of northern Queensland A large palm tree with a single trunk growing up to 30 m tall, and with a crown that contains a cluster of about 10-12 very large leaves. The grey trunk is up to 30 cm or more thick and ringed with noticeable leaf scars. The leaves are 3.5-4.5 m long on mature trees and have 60-80 narrow leaflets on each side <http://www.technigro.com.au/documents/WW%20Alexander%20palm.pdf>

- a. **Health & Vitality:** Average – the foliage of this palm appears to be generally healthy and growing vigorously, with no visible symptoms of decline.
- b. **Tree Form:** – they have formed a single stems with DBH of 200mm and form codominant canopy that is 8m in height, with a crown spread of 8x8m.
- c. **Structural Condition:** Average, retainable in the long term

**Tree 9 is an over – mature hedgerow comprised of twenty (20) *Cupressus sempervirens*:** ‘Italian Cypress is an evergreen tree with a narrow columnar habit of growth, and forms a tall, symmetrical, dark green column 6-9m in height. Trees are normally no more than 1-3m wide. This species has a very special form and is therefore only suited for certain landscapes. It is often used for framing, as a strong accent around large buildings or in a formal landscape, but does not lend itself well to many home gardens. It grows much too tall for most residential landscapes looking much like a green telegraph pole’ (Gilman, E. 1997)

- a. **Health & Vitality:** Low – these trees are showing typical symptoms of Cypress Canker, and are in irreversible decline (see Plate 2 & 3).
- b. **Tree Form:** these trees combine to form a hedgerow with an east/west axis that is m in height, and a crown spread of 25x6m
- c. **Structural Condition:** Poor, retainable for 0 – 5 years

**Tree No’s 10 & 11 are mature *Syagrus romanzoffiana*:** ‘Cocos Palm is a native of Brazil. It has a single grey trunk that can grow to 15m in height and forms a thick crown of deep-green, plume-like fronds which can spread to 8m. Individual fronds can grow to 4.5m long, bearing leaves with a green upper surface and greyish undersides. These palms are easily relocated (Cundall 2004).

- a. This species is a ‘weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014 (see Plate 2).

**Tree No. 12 is a mature hedgerow of *Ligustrum lucidum*:** (see description of tree 2)

- a. This species is a ‘weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014 (see Plate 2).
- b. These trees should be removed

**Tree 13 is a semi-mature *Melia azedarach*:** ‘White Cedar NSW South Coast to North Coast to North Qld, usually confined to the fringes of the forests within 100 km or so of the sea, but now cultivated in almost all parts of Australia, thriving at Alice Springs, Marree and other dry climate places. It is a shapely tree to 10 m tall and nearly as wide when grown in the open, with a broad crown and slightly drooping branches on a straight, sturdy main trunk: taller in its native habitat to 25 m or more and with only a small, tufted crown’ (Rowel 1980)

- a. **Health & Vitality:** Low – this tree has been heavily suppressed by the more dominant canopies of the Privet on its north-western side.
- b. **Tree Form:** This tree has a suppressed canopy that is 4m in height, with a crown spread of 7x4m.
- c. **Structural Condition:** Poor, retainable for 0 – 5 years

**Tree 14 is an over- mature *Albizia julibrissin*:** ‘Silk Tree originates from Japan to Western Asia and forms a deciduous tree to 6m in height, on a single trunk with a broad, umbellate canopy that is 7 – 8m in width. Flowers cover the top of the tree’ (Rowell, R. 1980)

- a. **Health & Vitality:** Poor – the foliage of this tree is very sparse, and is a typical symptom of decline in this short lived species.
- b. **Tree Form:** This tree has formed a single stem with DBH of 150mm and a codominant canopy that is 6m in height, with a crown spread of 6x10m.
- d. **Structural Condition:** Poor, retainable for 0 – 5 years

**Tree 15 is a mature hedgerow of sixteen (16) *Cupressocyparis leylandii*:** ‘Leyland Cypress is a hybrid between *Cupressus macrocarpa* and *Chamaecyparis nootkatensis* having an outstanding growth rate of up to 4m in six years, while the average growth for a thirty year plant is 20m, with a possibility of 30m under ideal



**Tree No's 24 & 25 are semi-mature *Liquidambar styraciflua*:** 'Sweet Gum is a large deciduous tree and can grow to about 30m tall; conical at first but broadening with age. The trunk forms a dominant central axis, the lower branches more or less horizontal, but ascending towards the apex; young branches and twigs prominently are ridged with a distinctive corky bark' (Rowell, R.1980)

- a. **Health & Vitality:** Average – the foliage of these trees appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 15).
- b. **Tree Form:** These trees have formed single stems with DBH's of 300 & 400mm and codominant canopies that are approximately 12m in height, with a crown spreads of 10x10m.
- c. **Structural Condition:** Average, retainable in the long term

**Tree No's 26 & 27 are codominant *Melaleuca quinquenervia*:** (see description of tree 19)

- a. **Health & Vitality:** Average – the foliage of these trees appear to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 13).
- b. **Tree Form:** These trees formed single stems with DBH's of 300 & 450mm and a codominant, asymmetrical canopy that is 17m in height, with a crown spread of 9x8m.
- c. **Structural Condition:** Average, retainable in the long term

**Tree No. 28 is a mature *Melaleuca quinquenervia*:** (see description of tree 19)

- a. **Health & Vitality:** Average – the foliage of these trees appear to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 14).
- b. **Tree Form:** This tree has formed four codominant stems with DBH's 400 and a codominant canopy that is 15.5m in height, with a crown spread of 11x9m.
- c. **Structural Condition:** Average, retainable in the long term

**Tree No's 29 & 31 are semi-mature *Liquidambar styraciflua*:** (see description of tree 24)

- a. **Health & Vitality:** Average – the foliage of these trees appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plates 15 & 16).
- b. **Tree Form:** These trees have formed a single stem with DBH of 300mm and codominant canopies that are 15m in height, with a crown spreads of 10x10m.
- c. **Structural Condition:** Average, retainable in the long term

**No's 33 – 34 are a codominant stand of mature *Melaleuca quinquenervia*:** (see description of tree 19)

- a. **Health & Vitality:** Average – the foliage of these trees appear to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 16).
- b. **Tree Form:** They have has formed stems with DBH's of 300 & 400mm and a codominant canopy that is 19m in height, with a crown spread of 10x12m.
- c. **Structural Condition:** Average, retainable in the long term

**No's 32, 35 & 36 are a codominant stand of mature *Melaleuca quinquenervia*:** (see description of tree 19)

- a. **Health & Vitality:** Average – the foliage of these trees appear to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 17).
- b. **Tree Form:** They have formed a single stem with DBH's of 350, 400 & 450mm and a codominant canopy that is 14m in height, with a crown spread of 8x9m.
- c. **Structural Condition:** Average, retainable in the long term

**No's 37 – 40 are a codominant stand of mature *Melaleuca quinquenervia*:** (see description of tree 19)

- a. **Health & Vitality:** Average– the foliage of these trees appear to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 18).
- b. **Tree Form:** They have formed stems with DBH.s of 220 - 550mm and a codominant, asymmetrical canopy towards the north that is 19m in height, with a crown spread of 11x17m.
- c. **Structural Condition:** Average, retainable in the long term

**No's 41 – 46 is a mature *Ligustrum lucidum*** (see description of tree 2)

- a. This species is a 'weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014
- b. These trees should be removed





**Tree 64 is an over- mature *Grevillea robusta*:** 'Silky Oak is endemic to coastal gullies and forests from the mid North Coast of NSW to the Atherton Tablelands, Qld. It forms a tall, slender evergreen tree to 30m in its native habitat, but much shorter elsewhere (Rowell 1980). Due to its potential size and its susceptibility to limb breakage, especially as the wood becomes brittle with age, it should not be located close to houses. (Gilman 1997) It grows into a tall slender tree to 30m in its native habitat, but much shorter elsewhere. It occurs natively in coastal forests of Qld and northern NSW, mostly in deep fertile soils near permanent streams, although it adapts to drier, poorer soils elsewhere when grown as an ornamental.' (Rowell.1980). Due to the clay derived soils and low average rainfall of Western Sydney, *Grevillea robusta* is generally a short lived ornamental tree with a life span of about 25 years.

- a. **Health & Vitality:** Poor – the foliage of this tree is very sparse and it appears to be in advanced decline (see Plate 26).
- b. **Tree Form:** This tree has formed a single stem with DBH of 350mm and a canopy that is 22m in height, with a crown spread of 12x9m.
- c. **Structural Condition:** Poor – Retainable for 0 – 5 years

**Tree 65 is a semi-mature is a mature *Ligustrum lucidum*** (see description of tree 2)

- a. This species is a 'weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014
- b. This tree should be removed

**Tree 66 is a mature *Lophostemon conferta*:** 'Brush-box occurs naturally in the coastal forests of NSW and Qld, between Port Stevens and the Tropic of Capricorn and on the eastern slopes of the Atherton Tablelands. In its native forest habitat it forms a tall, slender tree to 35-50m or more, with a pronounced straight trunk and a lofty crown of tufted foliage, but in the open, it forms a smaller, dense headed tree with a short trunk and a medium-domed crown to 15m or so. It requires deep, fertile, moist soil, often along or near a water course in the higher rainfall areas. When planted elsewhere, they are tolerant of a wide variety of soils but with a preference for the fertile loams or sandy soils with free drainage and a dependable water supply in summer.' (Rowell 1980)

- a. **Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate ).
- b. **Tree Form:** This tree has formed a single stem with DBH of 250mm and a suppressed, asymmetrical canopy with a bias towards the north that is 13m in height, with a crown spread of 8x8m.
- c. **Structural Condition:** Fair – Retainable for 0 – 5 years

**Tree 67 is an over- mature *Grevillea robusta*:** (see description on tree 64)

- a. **Health & Vitality:** Poor – the foliage of this tree is very sparse and it appears to be in advanced decline (see Plate 26).
- b. **Tree Form:** This tree has formed a single stem with DBH of 250mm and a codominant canopy that is 14m in height, with a crown spread of 8x8m.
- c. **Structural Condition:** Poor – Retainable for 0 – 5 years

**Tree 68 is a mature *Lophostemon conferta*:** (see description on tree 66)

- a. **Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 26)
- b. **Tree Form:** This tree has formed a single stem with DBH of 200mm and a suppressed, asymmetrical canopy with a bias towards the northwest that is 14m in height, with a crown spread of 8x7m
- c. **Structural Condition:** Fair – Retainable for 0 – 5 years

**Tree 69 is a semi-mature is a mature *Ligustrum lucidum*** (see description of tree 2)

- a. This species is a 'weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014
- b. This tree should be removed





towards the east that is 12m in height, with a crown spread of 14x10m.

- c. **Structural Condition:** Fair, retainable in the medium term

**Tree 85 is an over- mature *Liquidambar styraciflua*** (see description of tree No. 24

- Health & Vitality:** Average – this is a deciduous species and was dormant at the time of the inspection. However, an examination of the previous seasons of extension growth indicates that it's generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 35).
- Tree Form:** This tree has formed a single stem with DBH of 900mm and a large dominant canopy that is 22m in height, with a crown spread of 28x32m.
- Structural Condition:** Poor – some of the wide spreading branches of this tree are receiving mechanical support from the dwelling within its dripline. The proposed demolition of the dwelling will remove this support, and will expose them and others to unaccustomed wing loading. This will significantly increase their failure potentials. Retainable for 0 – 5 years

**Tree 86 is a mature *Arbutus unedo*:** 'Strawberry Tree is from southern Europe, Mediterranean region and Eire. A small evergreen tree to 6-8m, typically with a main trunk to 2-3m tall, and a broad-domed crown to 6-7m wide, the larger branches and trunk with colourful, red stringy bark, often spirally arranged.' (Rowell, R. 1980)

- Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 37).
- Tree Form:** This tree has formed a single stem with DBH of 350mm and a codominant, asymmetrical canopy with a bias towards the south that is 8m in height, with a crown spread of 8x4m.
- Structural Condition:** Poor, this tree is receiving mechanical support from the brick boundary fence. It is likely to damage the fence, and has a high potential of failure if the fence is removed. Retainable for 0 – 5 years

**Tree 87 is a semi-mature *Archontophoenix alexandrae*:** Alexander palm is an attractive plant native to the rainforests of northern Queensland A large palm tree with a single trunk growing up to 30 m tall, and with a crown that contains a cluster of about 10-12 very large leaves. The grey trunk is up to 30 cm or more thick and ringed with noticeable leaf scars. The leaves are 3.5-4.5 m long on mature trees and have 60-80 narrow leaflets on each side. <http://www.technigro.com.au/documents/WW%20Alexander%20palm.pdf>

- Health & Vitality:** – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 38).
- Tree Form:** This tree is comprised of two stem with DBH's of 150mm, with a canopy that is 8m in height, with a crown spread of 4x4m.
- Structural Condition:** Average, retainable in the long term

**Tree No's 88 - 90 is a mature hedgerow of *Cupressus sempervirens*** (see description of tree 9)

- Health & Vitality:** Average – the foliage of these trees appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 39).
- Tree Form:** These trees form a hedgerow with a north/south axis that is 10 - 12m in height, with a crown spread of 6x3m.
- Structural Condition:** Fair, retainable in the medium term

**Tree 91 is a mature *Lagerstroemia indica*** (see description of tree No. 1)

- Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline.
- Tree Form:** This tree has formed a multi-stemmed habit and a codominant, asymmetrical canopy towards the south that is 12m in height, with a crown spread of 7x12m.
- Structural Condition:** Average, retainable in the long term

**Tree 92 is a mature *Jacarandar mimosifolia*** (see description of tree No. 58)

- Health & Vitality:** Low – Twig and branch dieback in the outer canopy of this tree is indicative of declining health and vitality (see Plate 40).
- Tree Form:** – it has formed a single stem with DBH of 500mm and a dominant canopy that is 14m in height, with a crown spread of 15x13m.

- c. **Structural Condition:** Poor – Two codominant first order branches at about 2m high on the main trunk have a weak junction with a high failure potential (see Plate 41) Retainable for 0 – 5 years

**Tree 93 & 94 are mature *Photinia x fraseri* ‘Robusta’:** A large evergreen shrub, 4 – 5m tall, with many stems from the short trunk forming a top-shaped bush, but frequently seen as a single-stemmed tree as a result of pruning.’ (Rowell, R. 1980 Shrubs)

- a. **Health & Vitality:** Average – the foliage of these trees appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 40).
- b. **Tree Form:** They have formed multi-stemmed habits and combine to form codominant canopy that is 10m in height, with a crown spread of 13x10m.
- c. **Structural Condition:** Average – retainable in the long term

**Tree 95 is a semi-mature *Magnolia grandiflora*:** ‘Bull Bay Magnolia originates from the southern states of USA, around the Gulf of Mexico and north to Virginia. It forms an evergreen tree (usually less than 20m in height in Australia,) with a broad domed crown on a single trunk’ (Rowell 1980)

- a. **Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline.
- b. **Tree Form:** This tree has a multi-stemmed habit and a codominant canopy that is 9m in height, with a crown spread of 10x10m.
- c. **Structural Condition:** Average – retainable in the long term

**Tree 96 & 97 are mature *Camellia sasanqua*:** ‘A small evergreen tree to 6 – 8m tall in its native state, with a single trunk and elevated, conical crown 4 – 5m wide, but much modified in the modern cultivars to be tree-like, shrubby, drooping or pendulous. (Rowell 1980)

- a. **Health & Vitality:** – the foliage of these trees appear to be generally healthy and growing vigorously, with no visible symptoms of decline.
- b. **Tree Form:** They have multi-stemmed habits and their codominant canopies are 5m in height, with a crown spread of 10x8m.
- c. **Structural Condition:** Average – retainable in the long term

Tree 98 is a mature *Bauhinia variegata*: ‘Butterfly Bush’ is an evergreen tree to 5 – 8m tall, with a short single trunk which divides into several large, erect branches to form a vase-shaped crown. It is well furnished with bilobed leaves when properly managed but often sparsely foliaged in cool climates, becoming almost deciduous in mid-winter, thus minimising the risk of frost injury’ (Rowell, 1980)

- a. **Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 42).
- b. **Tree Form:** This tree has formed three codominant stems with DBH’s of 150mm and a codominant, asymmetrical canopy with a bias towards the east that is 14m in height, with a crown spread of 11x9m.
- c. **Structural Condition:** Fair – retainable in the long term

**Tree 99 is a *Hedera helix*:** English Ivy

- a. This is a climbing plant and is not relevant to this tree survey

**Tree 100 is a mature *Melaleuca decora*:** ‘This Paperbark grows to about 8 metres tall and is common on the Cumberland Plain, especially on swampy ground or heavy clay soils that are subject to occasional flooding. (Fairley & Moore 1989)

- a. **Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 43).
- b. **Tree Form:** This tree has formed a single stem with DBH of 300mm and a heavily suppressed, asymmetrical canopy with a bias towards the north that is 14m in height, with a crown spread of 8x9m.
- c. **Structural Condition:** Poor – retainable for 0 – 5 years

**Tree 101 is a mature *Morus nigra*:** ‘Black Mulberry’ is a native to southwestern Asia and forms a medium to large deciduous tree to 15m in height, usually based on a stout single trunk and low-placed branches supporting a medium-domed, leafy crown’ (Rowell 1980).

- a. Average – this is a deciduous species and was dormant at the time of the inspection. However, an

examination of the previous seasons of extension growth indicates that it's generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 43).

- b. **Tree Form:** – it has formed a single stem with DBH of 150mm and has been heavily suppressed by the more dominant trees on its southern side. This has resulted in a natural lean of 25° with a significantly suppressed, asymmetrical canopy towards the north that is 8m in height, with a crown spread of 5x7m.
- c. **Structural Condition:** Poor – retainable for 0 – 5 years

**Tree No's 102 - 104 is a codominant stand of semi-mature *Cinnamomum camphora*:** 'Camphor Laurel originates from China, Japan, Taiwan and neighbouring islands. It forms an evergreen tree to 15 – 20m in height, slender domed at first, becoming broad-headed to 15m in width at maturity, the trunk short and massive, the canopy with a closed but somewhat billowing surface' (Rowell 1980)

- a. **Health & Vitality:** Average – the foliage of these trees appear to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plates 43 & 45).
- b. **Tree Form:** They have formed a multiple stems with DBH's of 100 - 200mm and a large codominant, canopy that is 19m in height, with a crown spread of 22x14m.
- c. **Structural Condition:** Fair – retainable in the medium term

**Tree 105 is a mature *Lagerstroemia indica*** (see description of tree No. 1)

- a. **Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plate 44).
- b. **Tree Form:** This tree has been heavily suppressed by a more dominant Broad-leaved Privet growing beside its rootcrown. It has formed a multi-stemmed habit stem with a significant asymmetrical canopy towards the south that is 10m in height, with a crown spread of 6x10m.
- c. **Structural Condition:** Poor – retainable for 0 – 5 years

**Tree 106 is a mature *Ligustrum lucidum*** (see description of tree 2)

- a. This species is a 'weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014
- b. This tree should be removed

**Tree 107 is a mature *Lagunaria patersonia*:** 'Norfolk Island Hibiscus is an evergreen tree from the South Pacific which grows to 15m or so tall, with an erect main trunk and a shapely conical crown 6 – 8m wide, with abundant foliage' (Rowell 1980) 'Throughout the warmer months, it produces rose-pink to white flowers that look like small hibiscuses, to which it is closely related. These are followed by rough, inedible fruit about the size of a ping-pong ball, which are lined with barbed hairs that can be irritating to both man and beast. Early colonists called it the cow-itch tree' (Macaboy1979)

- a. This species is a 'weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014
- b. This tree should be removed

**Tree 109 – 114 is a hedgerow of *Ligustrum lucidum*** (see description of tree 2)

- a. This species is a 'weed of National Concern in the Sydney Region – harmful to human health and the environment, and is listed as an exempt in Penrith DCP 2014.
- b. This tree should be removed

**Tree 115 is a mature *Magnolia x soulangiana*:** 'The collective name for the interspecific hybrid progeny of *M. dendata* and *M. liliiflora*. It is an erect, deciduous tree to about 5 – 8m tall and 4-5m wide, usually growing on a single trunk but with low lateral branches' (Rowell 1980)

- a. **Health & Vitality:** Average – this is a deciduous species and was dormant at the time of the inspection. However, an examination of the previous seasons of extension growth indicates that it's generally healthy and growing vigorously, with no visible symptoms of decline
- b. **Tree Form:** This tree has formed a multi-stemmed habit and an understory canopy that is 8m in height, with a crown spread of 8x8m.
- c. **Structural Condition:** Average – retainable in the long term

**Tree 116 is a mature *Camellia sasanqua*:** (see description of tree No. 96)

- a. **Health & Vitality:** Average – the foliage of this tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline.
- b. **Tree Form:** This tree has formed a multi-stemmed habit and an understory canopy that is 7m in height, with a crown spread of 8x8m
- c. **Structural Condition:** Average – retainable in the long term

**Tree 117 – 121 form a codominant row of mature *Lophostemon conferta*:** (see description on tree 64)

- a. **Health & Vitality:** Average – the foliage of these tree appears to be generally healthy and growing vigorously, with no visible symptoms of decline (see Plates 46 & 47).
- b. **Tree Form:** They form a codominant row of street trees that is 13m in height, with average crown spread of 6x6m.
- c. **Structural Condition:** Average – retainable in the long term

#### 4.4 Site Photographs



Plate 1 – showing tree No’s 2 – 6 (Privets)



Plate 2 – showing tree No’s 9 – 11



Plate 3 – showing tree No. 9 (over-mature hedgerow)



Plate 4 – showing tree No. 1



Plate 5 – showing tree No. 15 (mature hedgerow)



Plate 6 – showing tree 16 with a significant colonisation of mistletoe



Plate 7 – showing tree No. 17

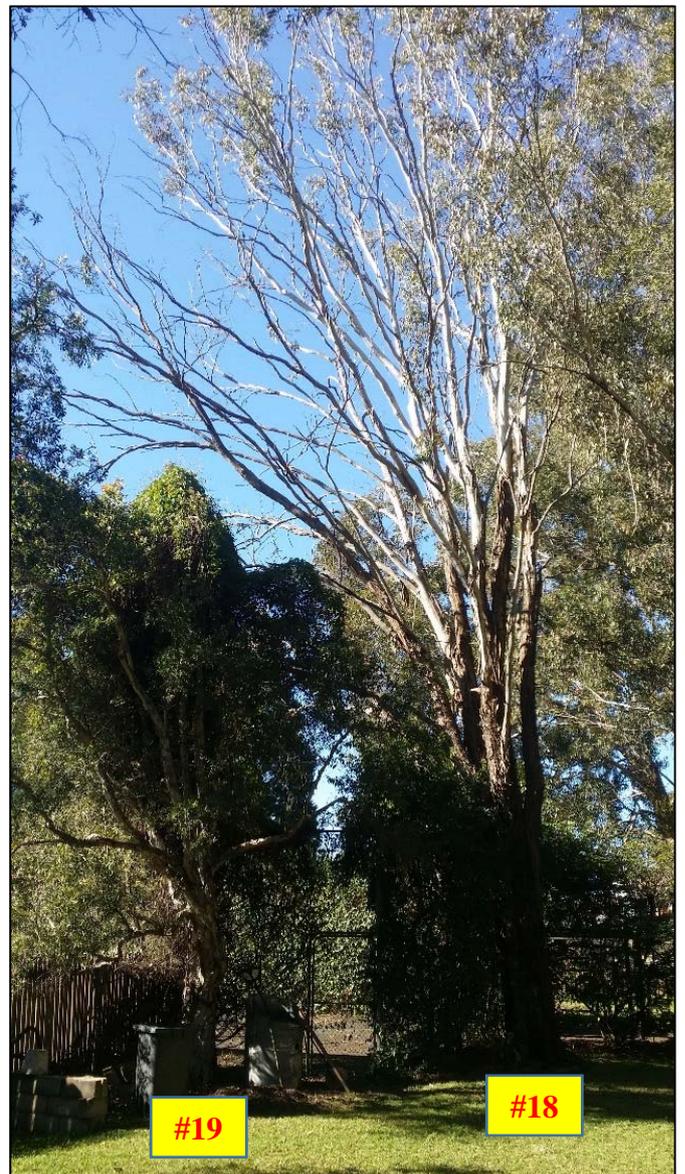


Plate 8 – showing tree No. 18, in advanced stages of decline



Plate 9 – Armillaria Root Decay on trunk of tree 18



Plate 10 – codominant stand of tree No's 20 - 23



Plates 11 & 12 – showing dieback and decline of tree No's 21 - 23







Plates 19 & 20 – showing tree No's 47 – 52



Plate 21 – showing tree No's 52 – 57 (hedgerow)





Plate 25 – sap weeping from junction in of tree 61

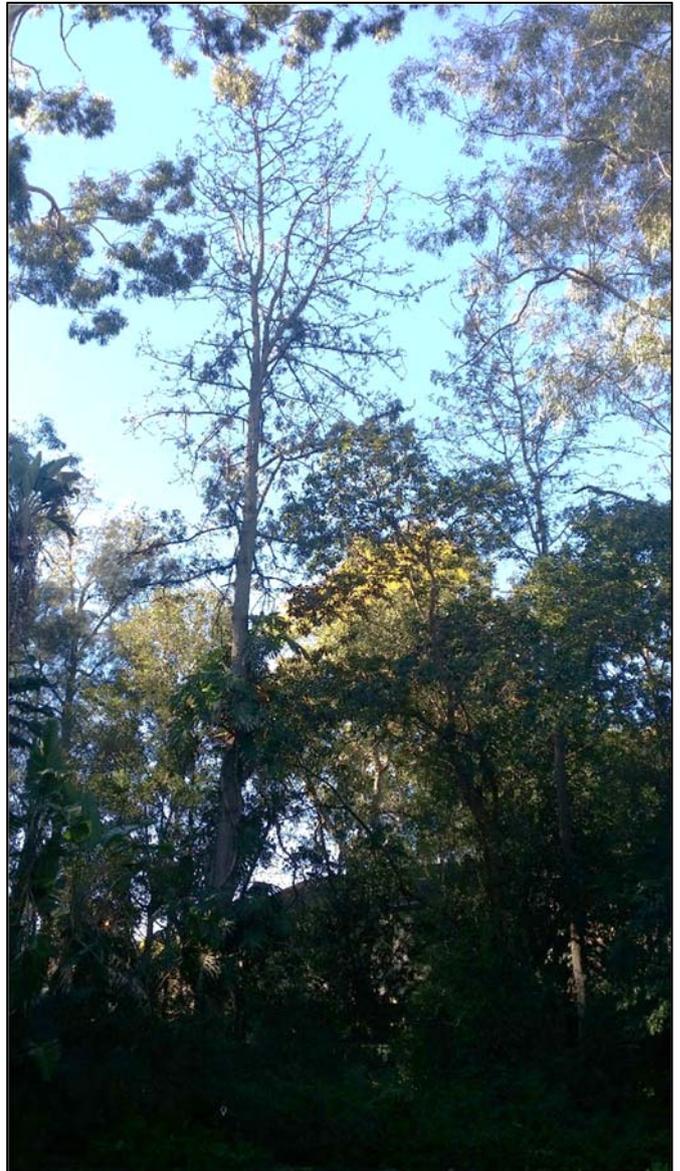


Plate 26 – showing dieback in canopy of tree No's 64 & 68

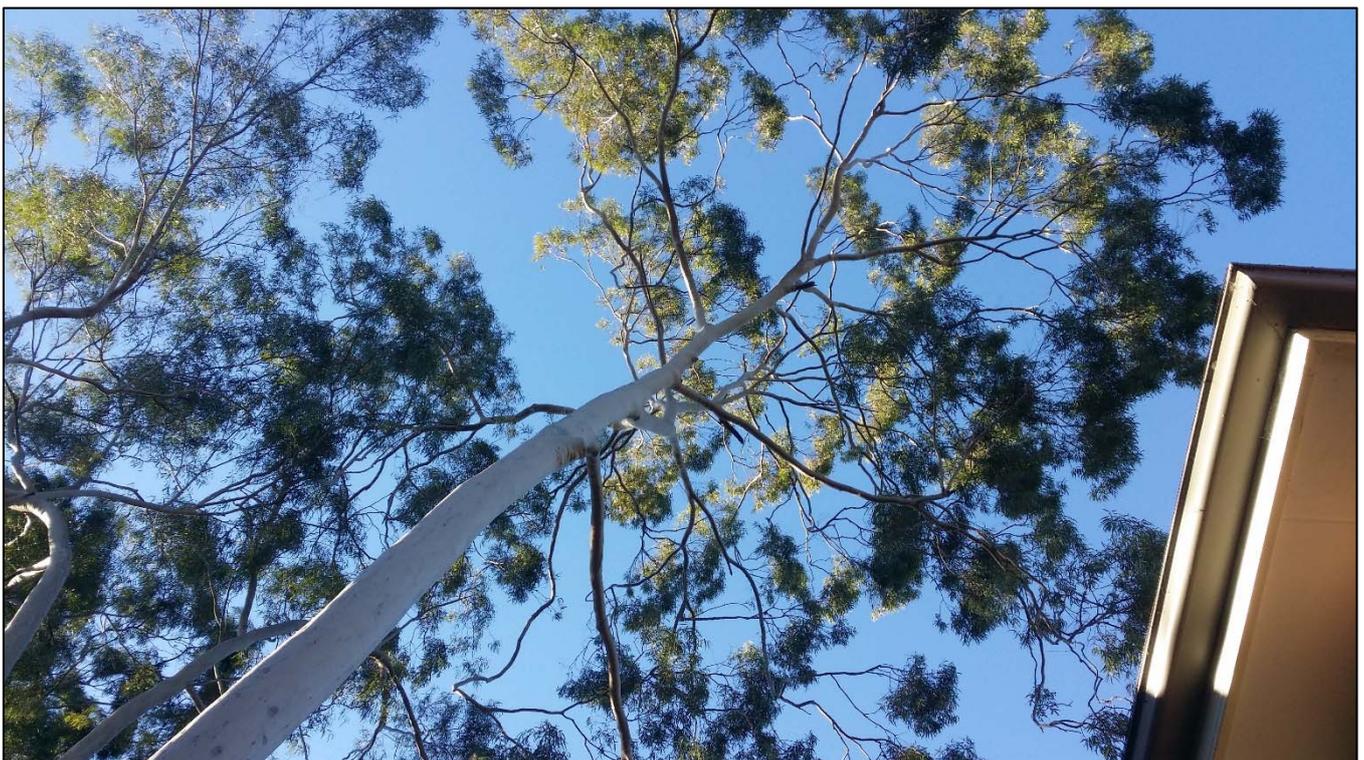


Plate 27 – showing significant asymmetrical canopy of tree No. 72



Plate 28 – showing codominant stand of tree No’s 70 – 72



Plate 29 – showing codominant canopies of tree No’s 73 & 74



Plate 30 – showing tree No’s 75 – 79



Plates 31 & 32 – showing tree No's 80 & 81, with a significant lean towards the east

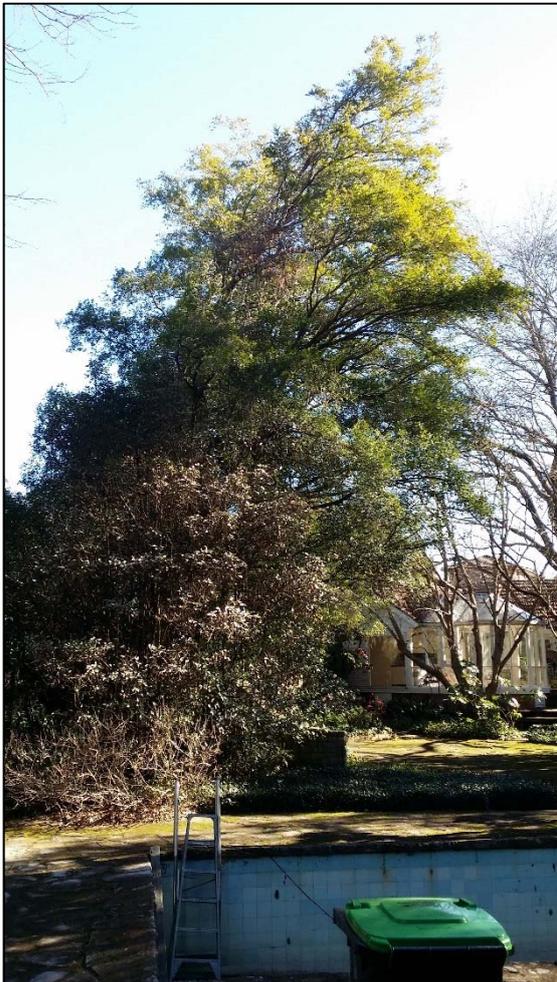


Plate 33 – showing tree 82

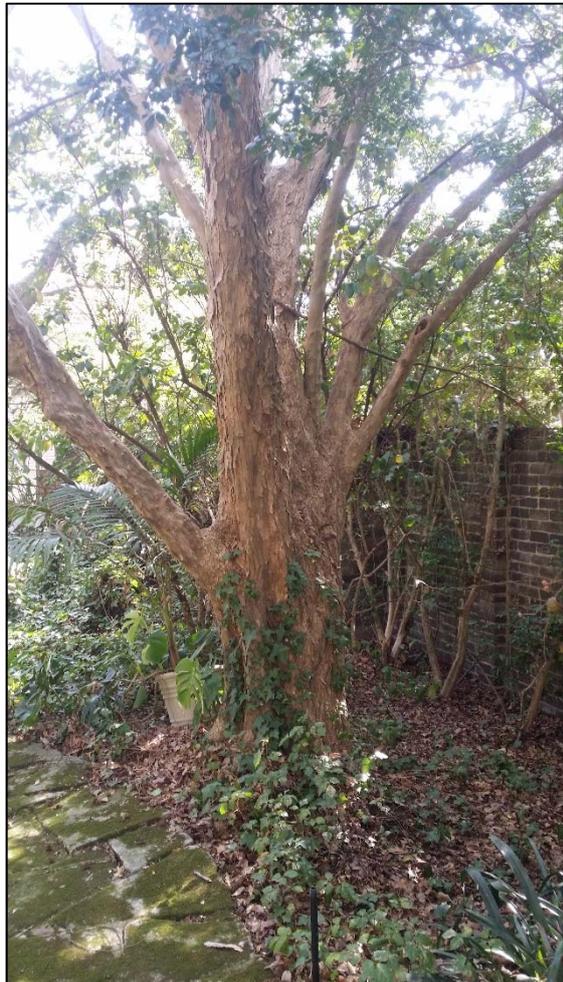


Plate 34 – showing tree 83



Plate 35 – showing tree No's 84 & 85

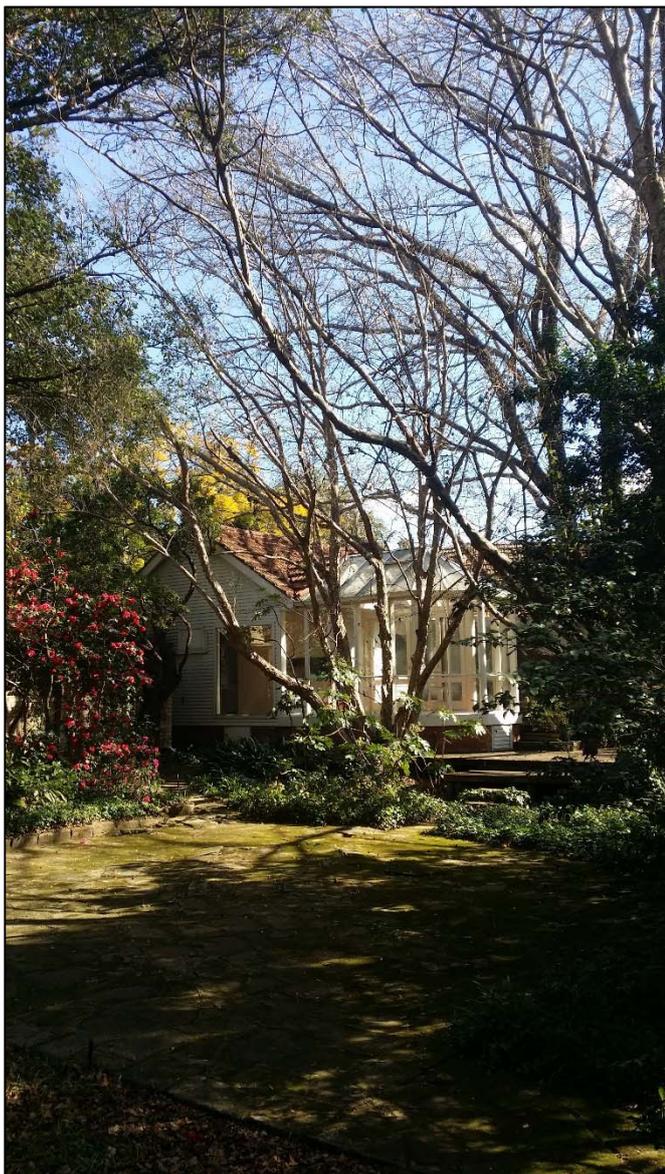


Plate 36 – showing tree 84

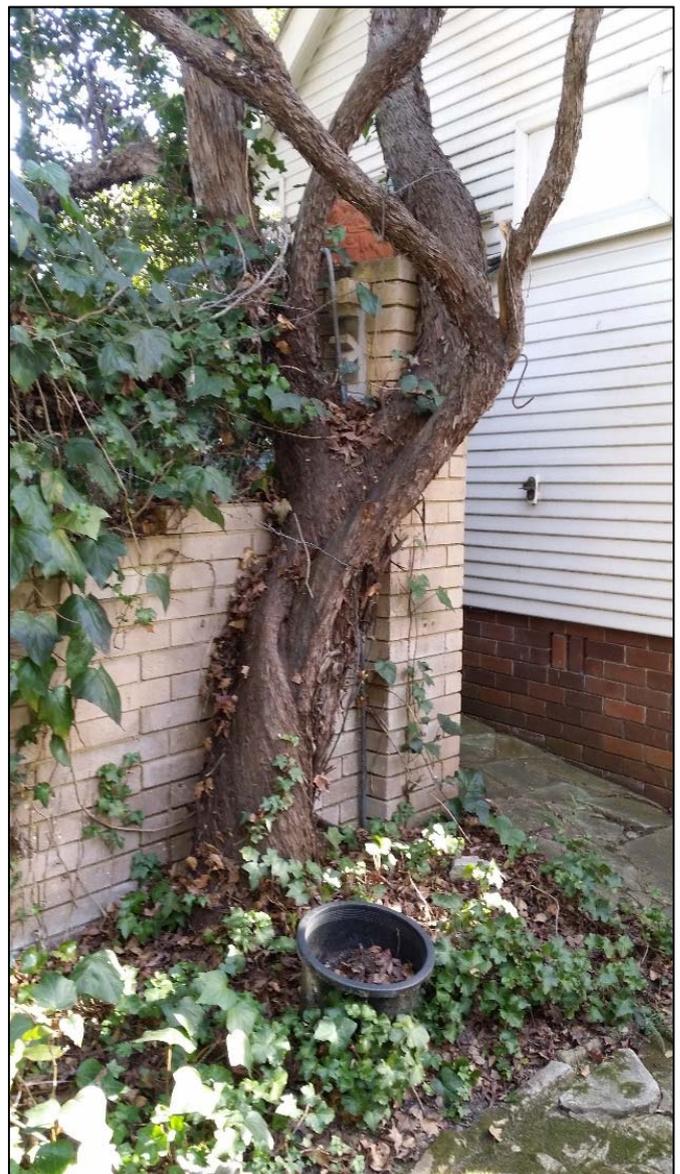


Plate 37 – showing tree 86



Plate 38 – showing tree 87

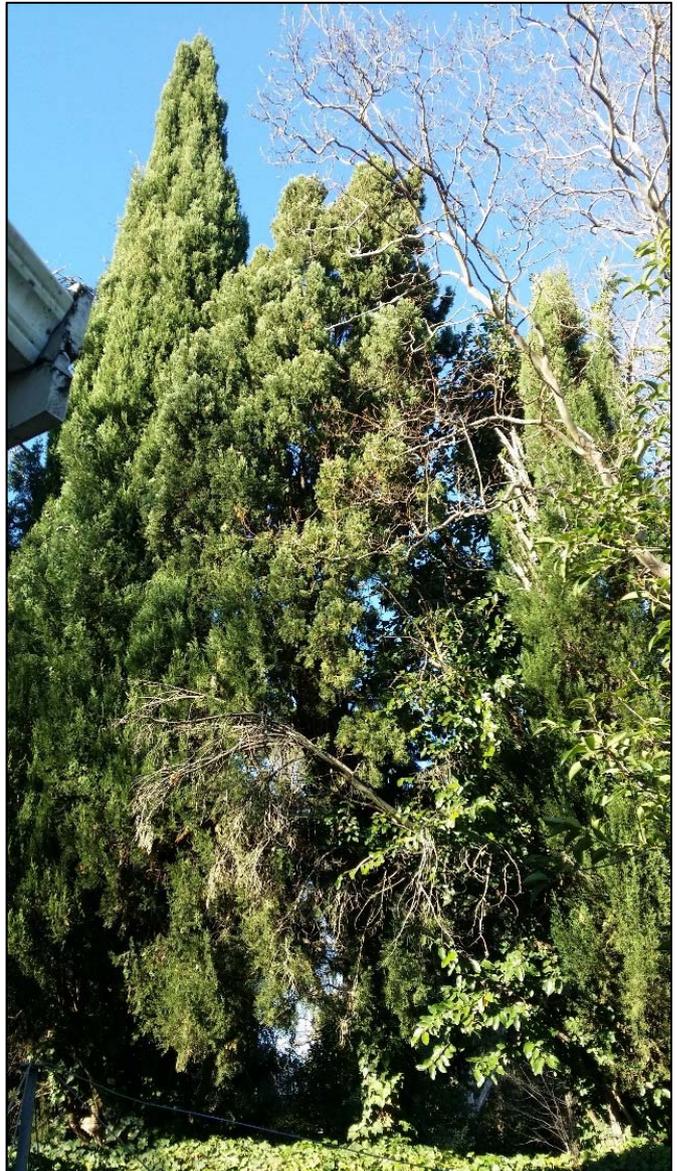


Plate 39 – showing tree No's 88 - 90



Plate 40 – showing trees 91 - 93



Plate 41 – showing tree 91



Plate 42 – showing tree 98



Plate 43 – showing tree No's 100 - 104



Plate 44 – showing tree No's 105 & 106



Plate 45 – showing tree No's 102 – 104



Plate 46 – showing tree No. 107



Plate 47 – showing tree No. 108

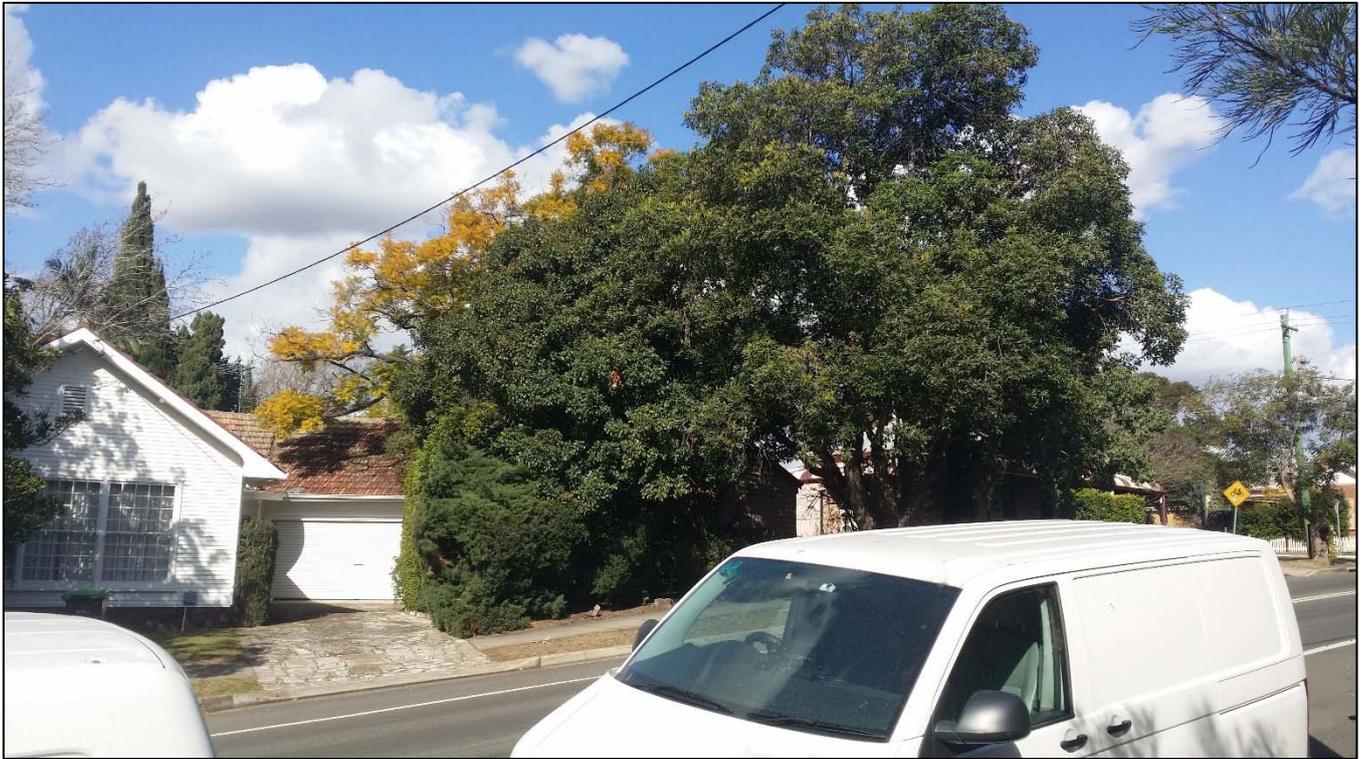


Plate 48 – showing tree No's



Plate 49 – showing tree No's

## 4.5 Retention Values

Sustainable Retention Index Value (SRIV©) considers its age class, condition class, vigour class and its sustainable retention with regard to the safety of people or damage to property. The ability to retain the tree with remedial work or beneficial modifications to its growing environment or removal and replacement is also considered (See Matrix in Appendices 9.2).

Unfortunately, like all methodologies used to assess trees, not all trees fit neatly into a category. For example, SRIV doesn't give consider the negative attributes that an individual tree may have, or of its suitability for the location.

**Long term retention:** Retainable for more than 40 years or more

- Tree No's 1, 8, 13, 15 – 17, 24 – 40, 47 – 49, 53 – 59, 63, 73 – 79, 82 – 84, 87, 88 – 91, 93 – 97, 102 – 104, 108, & 117 – 121 have retention value of MGVG (10); Mature tree with Good Vitality and in Condition with a retention value index of 10 – suitable for long term retention

**Medium Term Retention:** Retainable for 15 – 40 years or more

- Tree No's 19, 20, 48, 51 & 52, 66, 68, 98, have retention values of MGVF(9); Mature tree with Good Vitality and in Fair Condition with a retention value index of 9 – suitable for medium term retention

**Short Term Retention:** Retainable for less than 15 years

- Tree No's 61, 62, 68, 70 – 72, 80 & 81, 85, 86 100, 101, 105, have retention values of MGVP(5); Mature tree with Good Vitality and in Poor Condition with a retention value index of 5 – suitable for short term retention
- Tree No's 9 & 19 have retention values of MLVF(4); Mature tree with Low Vitality and in Fair Condition with a retention value index of 4 – suitable for short term retention

**Unsuitable for Retention:** likely to be removed immediately or within 5 years

- Tree No's 60, 61, 64, 67 & 92 have retention values of MLVP(0); Mature tree with Low Vitality and in Poor Condition with a retention value index of 0 – likely to be removed immediately or within 5 years
- Tree No. 21 have retention values of MPVP(0); Mature tree with Poor Vitality and in Poor Condition with a retention value index of 0 – likely to be removed immediately or within 5 years

### Exempt Species:

The retention Values of these trees have not been calculated, and it is assumed that they will be removed. This category includes tree No's 2 – 7, 10 – 12, 41 – 45, 65, 69, 106, 107, 108 (within 2m of a dwelling) & 109 – 114

#### 4.6 Safe Life Expectancy of the Tree (TreeA/Z)

'TreeAZ' is a systematic method of assessing whether individual trees are important, and how much consideration should be given to them in management decisions. It views each tree as being worthy of 'consideration' in the planning process, not automatically as a 'constraint' on development. Each tree is considered against a standard list of thirteen (13) negative attributes. If a tree fails any of these tests, it is categorised as 'Z' and further analysis stops. If it passes all attributes, it is categorised as 'A', and is then viewed as a constraint on the development (See Tree A/Z Categories in Appendices 9.3).

Tree No's 2 – 7, 10 – 12, 41 – 46, 65, 69, 106, 107, 108 (within 2m of a dwelling) & 109 – 114 have SULE Rating of Z1 – Exempt Species (invasive or noxious species)

Tree No. 9 (Cypress hedgerow), 14, 18, 21, 22, 64, 67 & 92 have SULE Rating of Z4 – Dead, dying, diseased or declining

- **Explanation:** *'Trees that should be removed despite statutory protection because they are in poor health, poor structural condition or otherwise unstable. The condition must be terminal with no obvious potential to recover, i.e. severe crown dieback related to excavation damage or root decay to the extent that the structural branch framework is compromised. This would also apply to diseases with no practical cure'* (Barrell (2006)).

Tree No's 60 – 62, 70 – 72, 80, 81, 100 & 101 have SULE Ratings of Z5 – Severe damage or structural defects that cannot be properly addressed by remedial care including cavities, decay, weak junctions, wounds and excessively unbalanced

- **Explanation:** *'Severe means that there is no realistic chance of the tree achieving its full potential with an acceptable level of risk. In many cases, acceptable levels of risk can be achieved by dramatic reduction in tree size, but this has severe health, maintenance cost and amenity implications, so it would not be considered to be a sustainable management option'* (Barrell (2006)).

Tree No. 19, 20, 23 & 85 has a SULE Rating of Z6 – Present or future instability because of poor anchorage or increased exposure

- **Explanation:** *'Alterations to tree exposure to the wind occurs because of changes in the shelter provided by adjacent objects such as buildings or other trees. This primarily applies to maturing and mature trees that have greater sail areas to catch the wind and established root systems that are less able to adapt to changes than younger trees. This often applies to groups of trees where one large dominant tree will be lost because of poor health or a structural problem, dramatically exposing the remaining trees in the group'* (Barrell (2006)).

Tree No's 48, 51, 52, 66, 68 & 96, 102 – 104 have SULE Rating of Z8 – Poor tree with no realistic potential to improve

- **Explanation:** *'It is common to find trees that are obviously unsuitable for long term retention for many reasons, including poor health, severe imbalance, tall, thin forms, or they have no realistic potential to improve. However, the problems are not so severe that they represent an immediate risk, and they shouldn't be discounted for this reason. The Z8 category is for these trees and relies on the principle of sustained amenity to justify the allocation. The short term retention of a tree that is obviously not going to improve and poses an ongoing level of risk is not good tree management and is just delaying its inevitable removal'* (Barrell (2006)).

Tree No's have SULE Ratings of **A1** – No significant defects and could be retained with minimal remedial care 1, 8, 13, 15 – 17, 24 – 40, 47, 49, 50, 53 – 59, 63, 73 – 79, 82 – 84, 87, 88 – 91, 93 – 97 & 117 – 121

## 5.0 DISCUSSION

This preliminary tree survey and summary report has been prepared in accordance with Clause 5.9 of Penrith LEP 2010 to allow the siting and layout of the proposed development to consider, at the initial concept stage, the location of trees and other vegetation and favour their retention.

This has been achieved by

- A summary of the Retention Values of the trees that is provided in Section 4.5
- An estimate of their Safe Live Expectancies is provided in Section 4.6
- Their recommended Tree Protection Zones and Structural Root Zones, in accordance with AS 4970, are provided in the Tree Survey Sheets in Section 10

In my opinion, the Retention Value Assessment in Section 4.5 doesn't give adequate considerations to the negative attributes that an individual tree may have, or of its suitability for the location. For example, Tree No. 62 in this report is in good health, but poor structural condition, and is suitable for short term retention. Due to the large size of the defective part, I would recommended that a tree in this condition be removed as soon as practically possible

For this reason, I prefer and recommended the TreeA/Z Assessment, provided in Section 4.6 as it considers more structural issues that should be considered on a proposed development site.

### 5.1 Trees considered unsuitable for retention

#### 5.1.1 Exempt Species (invasive or noxious species)

The following trees are exempt from Clause 5.9 of Penrith LEP 2010

- Tree No's 2 – 7, 10 – 12, 41 – 46, 65, 69, 106, 107 & 109 – 114 are listed as exempt species, and Clause 5.9 of Penrith LEP 2010 does not apply
- Tree No. 108 (within 2m of a dwelling) and Clause 5.9 of Penrith LEP 2010 does not apply

#### 5.1.2 Hazardous Trees:

The following tree were identified as being potentially hazardous

- **Tree No. 60 (*Corymbia citriodora*)** has significant dieback in its canopy and fruiting bodies of root decaying fungus on its root crown. The type of fungus was not identified, but another tree in close proximity (No. 18) has typical symptoms associated with Armillaria Root Decay (see additional information in Appendices 9.8)
- **Tree No. 61 (*Corymbia citriodora*)** has a two equal sized, codominant ascending branches at about 15m high on the main trunk. Staining along the trunk beneath this junction is a symptom of an internal crack, and it has a possible to imminent potential of failure (see Appendices 9.10 & 9.11)
- **Tree No. 62 (*Corymbia citriodora*)** has been heavily suppressed by the more dominant forms of No's 60 & 61. This has resulted in the formation of a significant asymmetrical canopy towards the northwest, and it will have a probable to imminent potential of failure if the more dominant trees are removed.

*'Trees that develop naturally with a lean may be as strong and stable as an upright tree due to the development of reaction wood and compensating root growth. Natural leans can develop in trees along the edge of a stand. Such trees are not prone to failure unless the adjacent trees are removed, exposing the leaning tree to unaccustomed wind stress'* (Matheny & Clarke 1991)

*'A sudden increase in exposure to wind is another factor that can lead to the failure of trunks and branches whose support has been provided partly by reaction wood. This problem often arises when neighbouring trees are felled, or when tall buildings are erected or demolished. In some cases, the neighbouring trees may have also provided direct physical support'* (Lonsdale 1999).

- **Tree No's 71 and 72 (*Corymbia citriodora*)** both have significant asymmetrical canopies, and their retention will be dependent on the retention of Tree No. 72. The removal of No. 72 will expose the edge type canopies of the remaining trees to uncustomed wind loading, and this will increase their failure potentials.
- **Tree No. 72 (*Corymbia citriodora*)** has formed a significant asymmetrical canopy towards the east, and most of its tall canopy overhangs a unit on No. Derby Street. The potential for a whole tree failure is considered unlikely at this stage, but the species is prone to Summer Branch Drop (see Appendices 9.12)
- **Tree No's 80 & 81 (*Melaleuca quinquenervia*)** are semi-mature trees with ° leans towards the east. They are being supported by the change rooms within their driplines, and the proposed demolition of this building will result in probable to imminent failures
- **Tree No. 85 (*Liquidamber styraciflua*)** is a mature tree with a wide spreading canopy. Some of these branches are receiving mechanical support from the dwelling in its dripline, and the proposed demolition of this building will result in probable to imminent failures
- **Tree No. 92 (*Jacaranda mimosifolia*)** is an over-mature tree with two equal sized diameter, codominant ascending branches and a partially failed weak junction. This has a probable to imminent failure potential.

### 5.1.3 Dead and declining trees

The following tree were identified as being dead or in decline

- **Tree No. 9 (*Cupressus sempervirens*)** is an over-mature hedgerow. They have typical symptoms associated with Cypress Canker, of which there is no effective control (see Appendices 9.7)
- **Tree No. 18 (*Eucalyptus moluccana*)** is in advanced stages of decline and has typical symptoms of Armillaria Root Decay (see Appendices 9.8)
- **Tree No's 21 (*Melaleuca quinquenervia*)** This tree is dead and is exempt from Clause 5.9 of Penrith LEP 2010
- **Tree No. 22 & 23 (*Melaleuca quinquenervia*)** have sparse foliage, and appear to be in declining health and vitality (see Appendices 9.9)
- **Tree No. 64 & 67 (*Grevillia robusta*)** are in advanced stages of decline. Treatment and or tree surgery techniques are unlikely to increase their safe life expectancies (see Appendices 9.9)

### 5.1.4 Trees with poor structural forms and are unlikely to improve

- **Tree No's 19 & 20 (*Melaleuca quinquenervia*)** – these trees have suppressed asymmetrical forms that will become recently exposed edge-type trees after No's 18, 20 & 23 are removed
- **Tree No's 48, 51 & 52 (*Casuarina cunninghamiana*)** – these trees have very tall thin canopies, with canopies that lean out of the stand
- **Tree No's 66 & 68 (*Lophostemon conferta*)** – these trees have suppressed asymmetrical forms that will become recently exposed edge-type trees after No's 67, 69 & 70 are removed
- **Tree No's 100 & 101** – these trees have heavily suppressed, edge type canopies towards the north
- **Tree No's 102 – 104 (*Cinamomum camphora*)** – these are a codominant stand of trees that have originated from suckers on an old stump. They are unsuitable for long term retention

## 5.2 Tree considered suitable for retention

This assessment determined that Tree No's 1, 8, 13, 15 – 17, 24 – 40, 47, 49, 50, 53 – 59, 63, 73 – 79, 82 – 84, 87, 88 – 91, 93 – 97, & 117 – 121 have SULE Ratings of A1 – No significant defects and could be retained with minimal remedial care.

- **Low Amenity & Ecological Values:** Tree No's 1, 8, 13, 58, 87, 95, 98, 114 and 115 are suitable for long term retention, but have limited ecological and amenity values. Their proposed removals may be considered to be justified for design layout purposes.
- **Tree No. 16 (*Eucalyptus moluccana*)** has been heavily colonised by mistletoe, and this is often associated with an irreversible decline spiral of this species in the local area. Careful consideration should be given to the practicality of trying to retain this tree in the long term.
- **Boundary Screening:** Tree No's 15 (hedgerow), 53 – 57 (hedgerow) 76, 77, 96 & 97 provide screening along property boundaries. Tree No's 87 – 90 are located on No. Derby Street, and also provide boundary screening. A priority should be made to retain these trees.
- **Tree No's 117 – 121 (*Lophostemon conferta*)** – these are council owned street trees, and their safe life expectancies are unlikely to be compromised by the proposed development, if appropriate tree protection methods are utilised

## 6.0 CONCLUSIONS & RECOMMENDATIONS

### 6.1 Conclusions

- Tree No's 1, 8, 13, 15 – 17, 24 – 40, 47, 49, 50, 53 – 59, 63, 73 – 79, 82 – 84, 87, 88 – 91, 93 – 97, & 117 – 121 have SULE Ratings of A1 – No significant defects and could be retained with minimal remedial care.
- Tree No's 2, 9 – 12, 18 – 23 41 – 46, 48, 51, 52, 60 – 62, 64, 67, 69 – 72, 80 & 81, 85, 86, 92 & 98 - 114 are not considered suitable for retention.

### 6.2 Recommendations

- This preconstruction survey should be used as a basis to select trees to be retained within the proposed development.
- Trees scheduled to be retained should be shown on the proposed site plan, and their Tree Protection Zones and Structural Root Zones of each tree should be included
- This will assist in the preparation of any required Arboricultural Impact Assessment.

If you require any further information, please feel free to contact me on 0439 758 658.

Lawrie Smith,  
Arboricultural Consultant









## 9.0 APPENDICES

### 9.1 QUALIFICATIONS & EXPERIENCE OF AUTHOR

#### QUALIFICATIONS

- Graduate Certificate in Bushfire Design, University of Western Sydney (2012)
- Diploma in Conservation & Land Management (AQF 5), Hortus Australia (2005)
- Advanced Diploma of Horticulture (Arboriculture – AQF 6), Hortus Australia (2002).
- Small Business Enterprise Certificate, Blue Mountains TAFE (1996).
- Certificate in Tree Care, Lynnfield West (1995).
- Tree Surgery Certificate, Ryde School of Horticulture (1990).
- Certificate in Horticulture, Wollongong TAFE (1987).

#### WORK HISTORY

- 1998 – Present *Self-employed as an Arboricultural Consultant.*
- 2000 – 2002. *Tree Management Officer*, Blue Mountains City Council.
- 1984 – 1998. *Self employed as a Practicing Arborist.*
- 1977 – 1978. *Tree pruning and removal*, SEC Victoria.
- 1975 – 1976. *Tree maintenance*, Queensland Forestry Commission.

#### FURTHER TRAINING

- Attendance of the following seminars or conferences;
  1. ISA Tree Risk Assessment Qualification (Renewal) Parramatta (2018)
  2. ICAA Concept to Construction, Parramatta (2017)
  3. Introduction to Risk Management –AS/NZS ISO 31000: 2009 (SAI Global 2014)
  4. ISA Tree Risk Assessment Qualification (TRAQ) Melbourne (2013)
  5. EIANZ Environmental Expert Professional Development Course (Sydney 2013)
  6. HEDRA Workshop (Sydney 2012)
  7. ISA National Conference Newcastle (2009)
  8. Tree Roots in the Built Environment, J. Urban (2008)
  9. *Phytophthora cinnamomi* – Workshop (2008)
  10. Trees on Construction Sites Workshop by J. Barrell (2006)
  11. ISA National Conference, Parramatta (2004)
  12. 5 Day Scientific Workshop on Tree Pathology and Wood Decay by F. Schwarze (2004)
  13. Safe Trees Seminar by Ed Hayes (2002)
  14. ISA National Conference, Melbourne (2002)
  15. Advanced Lecture on Visual Tree Assessment by Dr Claus Mattheck (2001)
  16. Trees for Urban Landscapes (2000)
  17. Assessing Hazardous Trees & their Safe Useful Life Expectancy (1997)

#### PROFESSIONAL ASSOCIATIONS

- International Society of Arboriculture (#152238)
- Fire Protection Association Australia (#26890)

## 9.2 SUSTAINABLE RETENTION INDEX VALUE (SRIV) ©

SRIV © provides a dual method of objectively rating the viability of urban trees for development sites based on general tree and landscape assessment criteria, and a numeric index for each tree as a tree management tool.

It is designed as an objective system based on set criteria to replace previous subjective systems, and is based on the principle of sustaining trees in the urban environment including remnant forest trees, but does not cover social aspects of trees, or hedges. Dead trees and environmental or noxious weed species are not considered as removal of these trees is generally encouraged.

The Glossary details the definitions for terms to be used with the SRIV© system are provided in Section 8, and are taken from the Institute of Australian Consulting Arboriculturists (IACA) © Dictionary for Managing Trees in Urban Environments<sup>1</sup>.

### 9.2.1 SRIV Matrix

<b>Good Vigour &amp; Good Condition</b>	<b>Good Vigour &amp; Fair Condition</b>	<b>Good Vigour &amp; Poor Condition</b>	<b>Low Vigour &amp; Good Condition</b>	<b>Low Vigour &amp; Fair Condition</b>	<b>Low Vigour &amp; Poor Condition</b>
<b>(GVG)</b>	<b>(GVF)</b>	<b>(GVP)</b>	<b>(LVG)</b>	<b>(LVF)</b>	<b>(LVP)</b>
Able to be retained if sufficient space available above and below ground for future growth.	Able to be retained if sufficient space available above and below ground for future growth.	Able to be retained if sufficient space available above and below ground for future growth.	May be able to be retained if sufficient space available above and below ground for future growth.	May be able to be retained if sufficient space available above and below ground for future growth.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth.
No remedial work or improvement to growing environment required. May be subject to high vigour.	Remedial work may be required or improvement to growing environment may assist.	Remedial work unlikely to assist condition, improvement to growing environment may assist.	No remedial work required, but improvement to growing environment may assist vigour.	Remedial work or improvement to growing environment may assist condition and vigour.	Remedial work or improvement to growing environment unlikely to assist condition or vigour.
<b>Medium to Long Term Retention</b>	<b>Medium Term Retention</b>	<b>Short Term Retention</b>	<b>Short Term Retention</b>	<b>Short Term Retention</b>	<b>Short Term Retention</b>
	Potential for longer with remediation or favourable environmental conditions.	Potential for longer with remediation work, or favourable environmental conditions.	Potential for longer with remediation work, or favourable environmental conditions.	Potential for longer with remediation work, or favourable environmental conditions.	Potential for longer with remediation work, or favourable environmental conditions.

<b>YGVG - 9</b>	<b>YGVF - 8</b>	<b>YGVP - 5</b>	<b>YLVG - 4</b>	<b>YLVF - 3</b>	<b>YLVP - 1</b>
	Index Value 8	Index Value 5	Index Value 4	Index Value 3	Index Value 1
Long Term Retention Potential	Short - Medium Term Retention Potential	Short Term Retention Potential	Short Term Retention Potential	Short Term Retention Potential	Likely to be removed immediately or retained for Short Term.
Likely to provide minimal contribution to local amenity if height <5m.	Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m.	Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m.	Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m.	Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m.	Likely to provide minimal contribution to local amenity if height <5m.
Retain, move or replace.	Medium-high potential for future growth and adaptability. Retain, move or replace.	Low-medium potential for future growth and adaptability. Retain, move or replace.	Medium potential for future growth and adaptability. Retain, move or replace.	Low-medium potential for future growth and adaptability. Retain, move or replace.	Low potential for future growth and adaptability. Retain, move or replace.

<b>MGVG - 10</b>	<b>MGVF - 9</b>	<b>MGVP - 6</b>	<b>MLVG - 5</b>	<b>MLVF - 4</b>	<b>MLVP - 2</b>
Index Value 10	Index Value 9	Index Value 6	Index Value 5	Index Value 4	Index Value 2
Medium - Long Term.	Medium Term.	Short Term.	Short Term.	Short Term.	Zero to Short
	Potential for longer with improved growing conditions.	Likely to be removed immediately or retained for Short term			

<b>OGVF - 6</b>	<b>OGVF - 5</b>	<b>OGVP - 4</b>	<b>OLVG - 3</b>	<b>OLVF - 2</b>	<b>OLVP</b>
Index Value 6	Index Value 5	Index Value 4	Index Value 3	Index Value 2	Index Value 0
Retention potential	Retention potential	Retention potential	Retention potential	Retention potential	Retention potential
Medium - Long Term.	Medium Term	Short Term	Short Term Potential for longer with improved growing conditions.	Short Term	Likely to be removed immediately or retained for Short Term.

### 9.3 SULE CATEGORIES (Safe useful life expectancy)

TreeAZ' is a systematic method of assessing whether individual trees are important, and how much consideration should be given to them in management decisions. Each tree is considered against a standard list of tree removal tests. If a tree fails any of these tests, it is categorised as 'Z' and further analysis stops. If it passes all the tests, it is categorised as 'A'.

**'Z' Tree are not suitable for retention for more than 10 years and not considered important or worthy of consideration in management decisions.**

**Exempt Species:** Trees that could be removed under TPO policies

**Z1** Exempt species (invasive or noxious species)

**Small Trees:** Plants that could realistically be easily replaced in the short term

**Z2** Less than 5m tall

**Z3** Formal hedges or trees regularly pruned to restrict size

**High Risk:** Trees that would be removed within 10 years because of declining health or poor structural damage

**Z4** **Dead, dying, diseased or declining**

**Explanation:** *'Trees that should be removed despite statutory protection because they are in poor health, poor structural condition or otherwise unstable. The condition must be terminal with no obvious potential to recover, i.e. severe crown dieback related to excavation damage or root decay to the extent that the structural branch framework is compromised. This would also apply to diseases with no practical cure'* (Barrell (2006).

**Z5** **Severe damage or structural defects that cannot be properly addressed by remedial care including cavities, decay, weak junctions, wounds and excessively unbalanced**

**Explanation:** *Severe means that there is no realistic chance of the tree achieving its full potential with an acceptable level of risk. In many cases, acceptable levels of risk can be achieved by dramatic reduction in tree size, but this has severe health, maintenance cost and amenity implications, so it would not be considered to be a sustainable management option*

**Z6** **Present or future instability because of poor anchorage or increased exposure**

**Explanation:** *Alterations to tree exposure to the wind occurs because of changes in the shelter provided by adjacent objects such as buildings or other trees. This primarily applies to maturing and mature trees that have greater sail areas to catch the wind and established root systems that are less able to adapt to changes than younger trees. This often applies to groups of trees where one large dominant tree will be lost because of poor health or a structural problem, dramatically exposing the remaining trees in the group'* (Barrell (2006).

**Good Management:** Trees that would be probably pruned or removed within 10 years through responsible management

**Z7** **Severe damage or structural defects that can be temporarily addressed by remedial care including cavities, decay, weak junctions, wounds and excessively unbalanced**

**Z8** **Poor trees with no potential to improve –**

**Explanation:** It is common to find trees that are obviously unsuitable for long term retention for many reasons, including poor health, severe imbalance, tall, thin forms, or they have no realistic potential to improve. However, the problems are not so severe that they represent an immediate risk, but their removals should not be discounted for this reason.

This subcategory is for these trees and relies on the principle of sustained amenity to justify the allocation. The short term retention of a tree that is obviously not going to improve and will pose an ongoing risk is not good tree management and is just delaying its inevitable removal.

**Z9 Adversely interfering with adjacent trees****Z10 Overgrown hedge or row of trees vulnerable to adverse weather events****Z11 Causing unreasonable inconvenience to existing properties (light, dominance, debris, interference)**

**Explanation:** *In its broadest sense inconvenience is the interference with the authorised use of land. In relation to trees, it can be in the form of root disrupting landscaping and hard surfaces, parts of trees physically preventing land use, tree debris such as leaves and fruit falling and tree crowns causing excessive shade. The principles for establishing what are acceptable levels of inconvenience are the same, irrespective of the cause.*

*In a community context, it is reasonable for individuals to tolerate some level of inconvenience from their presence. However, the precise location or value of these thresholds is not always obvious and is often a subjective interpretation rather than a definitive point. There will always have to be a balancing of the benefit to the community weighed against the inconvenience suffered by the individual. What is an acceptable, tolerable or reasonable level of inconvenience is often a matter of judgement for each specific situation, tempered by experience and common sense. This in turn should be guided by court, tribunal and planning decisions that have been made informed judgements on these issues.*

*Lack of sunlight is a common example, especially in regard to solar panels. People generally expect to be able to use a patio for sitting in the sun and if trees shade is to the extent that it cannot be used as intended, then that is excessive interference. However, if the garden is large and there are other places to do the same thing, then the case for tree removal might be weakened*

*On an international level, very large trees near existing occupiers buildings can dominate to the extent that the dis-benefit from the anxiety of the occupants outweigh the benefit of the tree. Similarly, regular and severe staining caused by fallen debris to a swimming pool surround may be unacceptable because the stark contrast in colours creates a dirty impression whereas the same staining on a path or driveway surface may be more acceptable. In contrast, falling leaves blocking gutters causing them to be cleaned one a year is not that much of a local inconvenience in the extent of the wider benefits that the trees impart.*

*Assessing inconvenience is almost entirely a subjective judgement, based on experience and understanding of what is perceived as being reasonable and unreasonable for a normal person. As with all these judgements, a simple test is to imagine a TPO appeal situation where an inspector has to decide if the levels of inconvenience are intolerable. If they are, then the tree is a Z11; if they are not that bad, then the tree belongs in another subcategory (Barrel 2006).*

**Z12 Causing or likely to cause damage to existing structures**

**Explanation:** *Damage as opposed to inconvenience – Where more serious damage occurs to property from root action, then court judgements on liability help to focus on what level of damage is deemed acceptable by society.*

*The most common example is direct damage from roots, trunks, and branches to structures and surfacing. Repairs to walls may vary require such extensive excavations and cutting of roots that the tree cannot be retained. However, the use of innovative techniques may reduce root damage but still provide a viable boundary, allowing the tree to be retained.*

*As a general rule, there would need to be good evidence of or potential for ongoing damage with little scope for remedial works before a tree could reliably allocated to this category (Barrel 2006)*

Council tree inspectors are not legal experts, but are often required to follow council policies that tend to put more emphasis on protect trees more than their rate payers and residents when assessing trees under their Tree Preservation Orders. For example, many Councils in the Sydney area do not consider root damage to privately owned fences and paved surfaces as being a valid reason to remove a tree.

A recent court decision in NSW indicates that this is not always consistent with the legal tort of nuisance and negligence. This case sets a precedent and Councils could now easily find themselves liable for future claims for damages. Refer to *Dimitrios Michos & Another v Council of the City of Botany Bay* [2012] NSWSC 625 (8 June 2012)

**Z13 Unacceptably expensive to retain**

**Explanation:** Degree of Cost – *This is a matter of judgement and may vary widely. It primarily applies to existing trees that are not suited to their location but there is resistance to their replacement. As a general principle, all trees will incur some management costs and these would normally not be a valid reason for removal. However, as these costs increase, their acceptability decreases to the point where it will be more cost effective to plant a new tree more suited to the location, rather than incur the burden of repeated and excessive costs indefinitely. Typical examples include topped trees with excessive decay, pollarded trees, to reduce subsidence risk, tree beneath powerlines, and trees close to buildings, roads and pathways. All these examples will require high levels of maintenance that may not be financially viable unless the benefits that arise from remaining trees are particularly high*

**‘A’ Trees are suitable for retention for more than 10 years and considered important and worthy of consideration in management decisions.**

- A1 No significant defects and could be retained with minimal remedial care**
- A2 Minor defects that could be addressed by limited remedial care or work to adjacent trees**
- A3 Special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years**
- A4 Trees that may have legal protection for ecological reasons**

## 9.4 SIGNIFICANCE ASSESSMENT

The significance of any tree in the landscape is usually based on the personal opinion of the assessor, and can therefore be very subjective. A major drawback of methodologies based on subjective criteria is the difficulty in consistently arriving at the same answer with different assessors. This problem can never be fully addressed, but if a methodology is going to be effective, it must provide the basis to allow an independent person to arrive at the same conclusion.

This methodology is based on numerous concepts used in the Arboricultural Industry (IACA 2009 & Thyer 2006). Five parameters of a tree are assessed, with each providing a numerical value. Each high significance parameter has a value of 20, each medium parameter has a value of 14, each low parameter has a value of 7 and each very low parameter has a value of 0

Only one parameter can be selected for each tree, and they are added together to provide its Significance Value. The highest Significance Value would be 100, and the lowest would be 0.

### 9.4.1 High Significance in the Landscape

- **Health & Vigour:** Tree with average vigour and typical of the species, considering its age, without noticeable decline, and expected to continue to remain so provided conditions around the tree required for its survival do not change.
- **Structural Condition:** Trees with good form; i.e. a single dominant trunk along which evenly spaced branches are spread. Branches have properly formed collars which provide strong attachment to the trunk, and are about 25% of the trunk diameter. Minor structural defects may be present with low failure potentials.
- **Ecological Value:** Indigenous species being an integral part of a natural ecosystem, and may be protected by Threatened Biodiversity Legislation
- **Amenity Value:** Superb, appealing specimen, attractive or interesting in all seasons.
- **Prominence:** Tree is known widely, of local historical importance, and/or listed as, or part of a Heritage Item

### 9.4.2 Medium Significance in the Landscape

- **Health & Vigour:** Tree is generally vigorous but shows some indications of decline due to pests and diseases or changes to its growing environment
- **Structural Condition:** Trees with structural defects with low failure potential
- **Ecological Value:** Remnant species of native vegetation
- **Amenity Value:** Attractive or interesting for part of the year
- **Prominence:** Tree is known locally or seen by many passers by

### 9.4.3 Low Significance in the Landscape

- **Health & Vigour:** Tree is in low vigour and in decline
- **Structural Condition:** Trees with structural defects with medium failure potentials and may require monitoring on an annual basis.
- **Ecological Value:** Native or introduced ornamental species - beneficial to fauna, food resource and/or shelter.
- **Amenity Value:** Ordinary or plain
- **Prominence:** Tree is only seen by neighbourhood residents and passers by

### 9.4.4 Very Low Significance in the Landscape

- **Health & Vigour:** Tree exhibits symptoms of advanced and irreversible decline due to fungal decay, major dieback of branch and crown canopy, predation of pests, storm or lightning damage, root damage, instability of the tree and alterations to its growing environment
- **Structural Condition:** Trees with defects which have failed, or have a high risk of failing soon, and corrective action must be taken as soon as possible.
- **Ecological Value:** Listed as a Priority Weed, Environmental Weed or an exempt species by the Local Council
- **Amenity Value:** Misshapen and/or unattractive, with little or no benefit to the local amenity
- **Prominence:** Tree is only seen by private owners or adjacent residents

## 9.5 IMPORTANCE OF THE ROOT SYSTEM

The most vulnerable part of a tree is its root system. As it is not visible and is poorly understood, it is frequently ignored, but damage or death of the root system will affect the health stability of the entire tree. When either a cut or fill occurs near trees, the root system is immediately reduced and the soil available for root growth is reduced.

### 9.5.1 Tree Protection Zone (TPZ)

The Tree Protection Zone (TPZ) is the principle means of protecting trees on development sites. The TPZ is a combination of the root area and crown area that requires protection. It is an area isolated from construction disturbance, so that the tree remains viable (AS – 4970)

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

TPZ = DBH x 12 (DBH = trunk diameter measured at 1.4m above ground level)

The radius of the TPZ is measured from COT (Centre of the trunk).

A sturdy protective fence is required around each tree to prevent damage occurring in the TPZ.

### Variations to a TPZ

While TPZ's usually form a circular area under AS 4970, British Standard 5837 allows the area of a TPZ in m<sup>2</sup> to be converted into a square. This slightly reduces the extent of the TPZ while protecting the same amount of area in m<sup>2</sup>'s. BS 5837 also allows a 20% variation in the location of the centre of the TPZ, while AS 4970 allows a minor variation of 10%, with any further variation subject to advice from the project Arborist.

### 9.5.2 Structural Root Zone (SRZ)

The Structural Root Zone (SRZ) is the area around the base of a tree required for its stability. The woody root growth and soil cohesion in this area are necessary to hold the tree upright; therefore there are no variations to its size. The SRZ is normally circular with the trunk at its centre and is expressed by its radius in metres (AS – 4970). Due to the potential of causing instability of a tree, it is highly recommended that no roots within its SRZ are pruned or removed.

### 9.5.2 References to Appendices 9.5

- AS 4970 (2009) 'Protection of trees on construction sites' Standards Australia, Sydney, Australia





## 9.7 CYPRESS CANKER

This is a disease of some *Cupressus* species, caused by the fungus *Monochaetia* sp. This is an air-borne fungal disease which enters the plant through damaged areas of stems and causes die-back of the foliage.

**Symptoms:** The colour of the foliage of whole branches changes almost overnight; from a healthy green, bluish-green or gold to a duller, lighter shade, then to brown as the foliage is deprived of moisture and nutrients. Splits often occur in the bark of dead branches, revealing a brown powder-like material. Resin exuding from fungus infected bark is also a common sign. Left untreated, the disease progressively moves through the plant, leading to its eventual death (Gardening Australia 1998).

The symptoms are superficially similar to that of Cypress Weevil and Cypress Bark Beetle, but an examination of the bark will readily reveal if insect damage is present. However, caution should be exercised, as borers can often colonize a plant in this weakened condition, and can often be blamed for its decline.

The fungal spores can be transported by wind and by water droplets, insects and birds. Entry to the plant is usually gained through small natural fissures in the bark in the branch crotches, or through injuries to the trunk caused by broken branches or whipper-snipper damage. Once inside the tree, the fungus destroys the sapwood and causes the death of the branches or main trunk above the infected area.

**Control:** As is the case with many diseases, attack is more likely to occur on weaker individuals

- Keep plants in healthy vigorous condition with regular feeding and watering
- Avoid causing injuries to bark
- Sterilize garden tools to prevent spreading fungus to other plants
- Undertake a regular spraying program during the active growing months (see below)

‘Cypress Canker can be controlled to some extent by monthly spraying with Foli-R-Fos 200 or Phos acid 200 according to the manufacturer’s instructions from September to April. This doesn’t actually kill the fungus, but it gives the plant more resistance to survive the infection (Royal Botanic Gardens, Sydney 1999).

‘The chemical used is phosphorous acid, which has been used by the avocado industry to overcome a looming disaster in the form of *Phytophthora* dieback disease. Control of the disease has proved successful where treatment was initiated early, though some varieties respond better than other. For example, ‘Naylor’s Blue’ has shown better rates of recovery than ‘Castlewellan Gold’. Trees that had lost more than 30% of their foliage were slow to recover, and some continued to decline. Those with less than 20% damage responded quickly to treatment’ (Gardening Australia 1998).

‘Small trees can be sprayed with the prepared chemical to the point of run-off from their foliage. An ongoing spraying program of copper oxychloride is also recommended as a preventative measure for all conifers in the garden’ (Gardening Australia 1998).

‘Control of large trees cannot be considered worthwhile on economic grounds, as fungicides must be injected regularly to protect them from the fungus. *Cupressus macrocarpa*, *C. sempervirens* and *Chamaecyparis lawsoniana* are very susceptible, and it is doubted whether it is worth planting these species. *C. glabra* and *C. torulosa* seem to have some resistance’ (Hadlington 1988).



## 9.9 DECLINING HEALTH & DIEBACK

Dieback refers to the progressive death of a tree or branch from its extremities towards the roots (Strouts & Winter 2007). Isolated trees, or entire forests, can be affected (Heatwole & Lowman 1986). It is best described by symptoms that can be observed and grouped into stages of increasing severity.

The first stage is a general decline and thinning of the crown, beginning at the tips of the twigs and progressing along the branches towards the trunk. As the outer parts die, the dead ends of branches may protrude beyond the remaining foliage. These are referred to as stags or stag heads. Once there has been considerable thinning of the foliage in the crown, new shoots may be produced directly from the trunk or main branches. These shoots, called *epicormic shoots*, give the tree a distinct, compact appearance.

If the cause of the initial problem is of a minor nature, or it is otherwise overcome, the epicormic shoots will eventually be replaced by, or develop into, a new healthy crown. If not, they in turn will begin to die. There may be several cycles of production of epicormic shoots followed by their decline and death.

As long as the tree has sufficient reserves of energy to produce new shoots, it can continue to fight the malady. However, once those reserves are exhausted, no further epicormic shoots can be produced; this leads to the third and final stage of dieback, death of the whole tree.’ (Heatwole & Lowman 1986)

The death of a tree is a complex event, usually resulting from the cumulative effects of multiple stresses over a prolonged period (Roberts, Jackson & Smith 2006). Unless death is obviously the result of some catastrophic event, such as a lightning strike or deliberate poisoning, attributing death to a single cause or event is not usually possible (Franklin 1987).

In general, trees die when they are unable to acquire or mobilise sufficient resources to occlude injuries or otherwise sustain life (Waring 1987). Therefore, a tree’s health and vitality depends on carbon assimilation and allocation to reserves and defensive strategies over the preceding years. If energy reserves are low, or have been depleted, a tree being placed under stress from disease, drought or damage to its root system is unlikely to recover.

### 9.9.1 Mortality Spiral:

The effect of multiple stresses on a tree over a period of years which eventually cumulate in its death has been described as a mortality spiral (Franklin 1987) These are usually caused by modifications to the tree, or its growing environment, rendering it vulnerable to pests and diseases, which gradually exhausts its energy reserves and results in its premature death. It can be caused by one of, or a combination of, the following:

- Sealing of the ground surface with concrete or bitumen
- Trenches for footings, underground services and storm water systems
- Soil excavation, filling or compaction
- Tree Lopping

A hypothetical mortality spiral of an urban tree could be initiated by replacing turf beneath it with pavement. The normal infiltration of rainwater into the soil around its root system is disrupted and diverted away as runoff. The tree begins to suffer from ‘drought’ and a relative amount of foliage is shed to avoid dehydration. This reduces the amount of energy produced by photosynthesis, and the tree is predisposed to insect predation, which further weakens it.

Desiccation of portions of the crown and branch dieback might follow in subsequent years, further reducing energy levels and increasing its vulnerability to insects and diseases. Death of the tree will likely follow, and will probably be attributed to a particular pathogen (Roberts, Johnson & Smith, 2006)

### 9.9.2 References to Appendices 9.2

- Franklin, J., Shugart, H. & Harmon, M. (1987) ‘Tree death as an ecological process’ *BioScience*, 37, 550-556
- Heatwole, H. & Lowman, M. (1986) ‘Dieback, death of an Australian landscape’ Reed Books Pty Ltd. Frenchs Forest, NSW
- Roberts, J. Jackson, N. & Smith, M. (2006) ‘Tree Roots in the Built Environment’ Research for Amenity Trees No. 8, Department for Communities and Local Government. The Stationary Office, Norwich, NR31BN
- Strouts, R. & Winter, T. (2007) ‘Diagnosis of ill-health in trees’, Research for Amenity Trees No. 2, Department for Communities and Local Government. The Stationary Office, Norwich, NR31BN
- Waring, R. (1987) ‘Characteristics of tree predisposed to die’ *BioScience*, 37, 569-574

## 9.10 BRANCH STRUCTURE

Collars form around the base of branches to help them remain attached to the trunk (Shigo 1985). The overlapping branch and trunk tissue in the collar physically secures the branch to the trunk. If the collar forms improperly or is lacking, then branches may not be well secured to the trunk (Gilman 2003). Codominant stems typically lack the overlapping tissue present in a collar, as each acts as the main trunk, and this explains why these are somewhat weaker (Edberg 1994).

The pictures in Plate 3 help to show how a branch stays on a trunk. The dark lines represent the branch tissues. A & B shows two views of new tissue at the branch base. After the branch tissues have formed new layers of trunk tissues grow over the branch base (No C & D). The Plate 4 represents three consecutive years of trunk collars forming over branch collars (3 is three year old growth, 2 is two year old growth and 1 shows the current seasons growth). The resulting union has such strength that high winds and great pressure cannot usually separate the branch from the trunk.

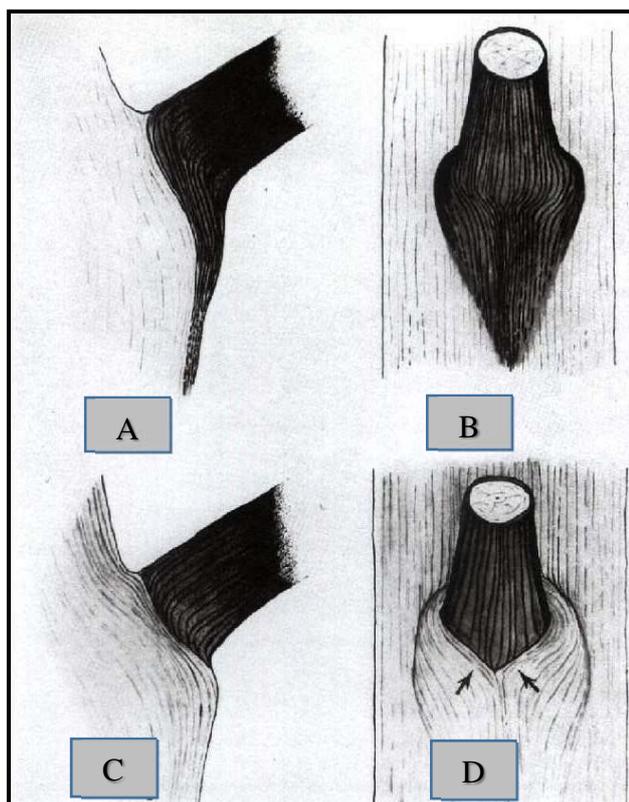


Plate 3 – Branch Collar Formation (Shigo 1986)

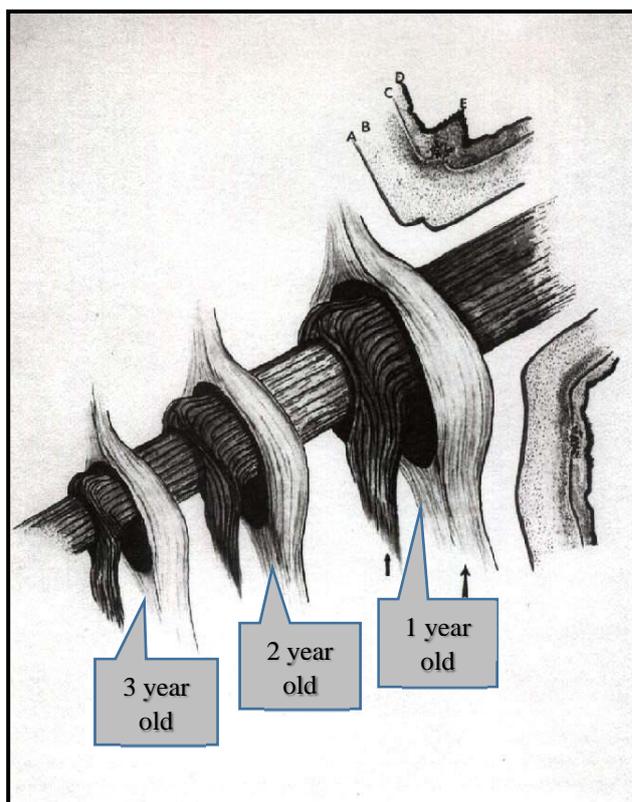


Plate 4 – 3 years of overlapping collars (Shigo 1986)

### 9.10.1 Defects that may increase the potential for branch failures

'Defects that increase the potential for branch failure include;

- The presence of codominant or multiple stems
- Included bark and weak junctions
- A history of branch failures within a tree,
- Wounds, cavities, cankers, cracks, bulges or decay symptoms, especially on branch junctions.
- Dieback and epicormic growth
- Termite activity
- Poor taper, overly-extended and/or heavily end loaded horizontally inclined branches,
- Extensive removal of large limbs that expose the inner canopy of the tree
- Rubbing branches
- Formation of branch shedding collars

The absence of such defects would indicate that a tree has a low potential for branch failure' (Matheny & Clarke 1994).

### 9.10.2 References to Appendices 9.10

- Edberg, J., A.M. Berry, and L.R. Costello (1994) '*Patterns of Tree Failure in Monterey Pine*' J. Arboric 20: 297-304.
- Gilman, E, (2003) '*Branch-to-Stem Diameter Ratio Affects Strength of Attachment*' J. Arboriculture V. 29, No 5, Sept 2003.
- Matheny, N.P. & Clark, J.R. (1994) '*A Photographic Guide for Evaluation of Hazard Trees In Urban Areas*', International Society of Arboriculture.
- Shigo, A, (1985) '*How Tree Branches are Attached to Trunks*' Can. J. Bot. 63: 1391- 1401.
- Shigo, A. 1986 '*A New Tree Biology*' Shigo & Trees, Associates, Durham, New Hampshire USA



### 9.11.2 INCLUDED BARK JUNCTIONS

These are usually caused by storm damage, lopping or a genetic predisposition of the species or individual. They usually occur where two or more branches of about equal size arise at approximately the same level on the trunk, especially if the angle of attachment is narrow, and the branches are too close together.



Figure 2 – showing weak junction



Figure 3 – partially failed weak junction

In this situation, two layers of compressed bark are embedded within the junction. Tree branches and trunks increase their girth annually when new wood is produced in the cambial region. If a branch junction is too narrow, this new wood compresses the two layers of bark within the junction a bulge often formed along its sides as additional wood tissue is formed.

Branch junctions with included-bark are structurally weaker than those that have connective tissue throughout the crotch. As the branches above an included bark junction increase in height, they also increase in weight which tends to pull the junction apart. This hazardous situation is increased dramatically in wet and/or windy conditions. A tree with vertical branches has less leverage on the weak junction. As it matures, its growth form is more spreading and if the branches become more horizontal, this applies more leverage force to the weak junction.

### 9.11.3 References to Appendices 9.11

- Edberg, J., A.M. Berry, and L.R. Costello (1994) '*Patterns of Tree Failure in Monterey Pine*' J. Arboric 20: 297-304.
- Gilman, E, (2003) '*Branch-to-Stem Diameter Ratio Affects Strength of Attachment*' J. Arboriculture V. 29, No 5, Sept 2003.
- Mattheck, C. (1994) '*The Body Language of Trees*' International Society of Arboriculture.
- Matheny, N.P. & Clark, J.R. (1991) '*A Photographic Guide for Evaluation of Hazard Trees In Urban Areas*', International Society of Arboriculture.
- Shigo, A, (1985) '*How Tree Branches are Attached to Trunks*' Can. J. Bot. 63: 1391- 1401.
- Shigo, A. 1986 '*A New Tree Biology*' Shigo & Trees, Associates, Durham, New Hampshire USA.





Tree No	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20	
Species	<i>Syagrus romanzoffiana</i>	<i>Ligustrum lucidum</i>	<i>Melia azedarach</i>	<i>Albizia</i>	<i>Cupressocyparis leylandii</i>	<i>Eucalyptus moluccana</i>	<i>Eucalyptus moluccana</i>	<i>Eucalyptus moluccana</i>	<i>Melaleuca quinquenervia</i>	<i>Melaleuca quinquenervia</i>	
DBH (mm)	200	14x 150	multi	150	16x 150	1000	900	750	2x 300	400	
RCD (mm)	300	14x 200	300	250	16x 250	1100	1000	900	550	500	
Height (m)	7.5	8.5	4	6	22	26	29	26	9	9	
Canopy Spread (m)	N	3	3	3	0	11	17	8	13	3	4
	S	3	3	4	6	11	14	10	0	5	4
	E	3	11	3	5	2	15	9	8	0	4
	W	3	11	1	4	3	14	12	9	5	4
Age Class	M	M	S/M	O/M	M	M	M	O/M	M	M	
Canopy Type Direction	X	X	S	X	C	C	C	C/E	S	C/E	
Health	X	X	A	X	A	A/F	A	P	F/P	A	
Condition	X	X	A	X	A	A	A	P	A	A	
Amenity	X	X	L	X	H	H	H	V/L	L	L	
Prominence	X	X	L	X	L	M	M	M	L	L	
Ecological	X	X	L	X	L	M	M	M	L	L	
Significance Value											
Retention Value	0	0	>40	0	>40	>40	>40	0	0	0	
SULE	Z1	Z1	A2	Z4	A1	A1	A1	Z4	Z6	Z6	
TPZ (m)	X	X	3.0	X	2.4	12.0	10.8	X	X	X	
SRZ (m)	X	X	2.0	X	1.8	3.4	3.3	X	X	X	
Additional Comments	Exempt species in DCP 2014	Exempt species in DCP 2014	Heavily suppressed by tree No. 3	Over-mature tree in advanced stages of decline	Retainable hedgerow	Heavily colonised by mistletoe	Retainable	Advanced decline with high failure potential	Heavily suppressed	Significant asymmetrical canopy towards the east	





Tree No	#41	#42	#43	#44	#45	#46	#47	#48	#49	#50
Species	<i>Ligustrum lucidum</i>	<i>Casuarina cunninghamiana</i>	<i>Casuarina cunninghamiana</i>	<i>Melaleuca quinquenervia</i>	<i>Casuarina cunninghamiana</i>					
DBH (mm)	multi	multi	multi	120	150	multi	400	250	2x 200	450
RCD (mm)	600	400	200	200	200	500	600	300	400	600
Height (m)	8	8	8	8	8	7	22	21	14	22
Canopy Spread (m)	N	5		3		2	6	4	5	7
	S	5		3		2	9	5	4	5
	E	3		4		1	4	4	5	8
	W	3		4		3	7	4	2	8
Age Class	x	x	x	x	x	x	M	M	M	M
Canopy Type Direction	x	x	x	x	x	x	C	I	C	D
Health	x	x	x	x	x	x	A	A	A	A
Condition	x	x	x	x	x	x	A	P	A	A
Amenity	x	x	x	x	x	x	M	M	M	M
Prominence	x	x	x	x	x	x	L	L	L	L
Ecological	x	x	x	x	x	x	M	M	L	M
Significance Value	x	x	x	x	x	x				
Retention Value	0	0	0	0	0	0	>40	<15	>40	>40
SULE	Z1	Z1	Z1	Z1	Z1	Z1	A1	Z8	A1	A1
TPZ (m)	X	X	X	X	X	X	4.8	3.0	4.0	5.4
SRZ (m)	X	X	X	X	X	X	2.7	2.0	2.3	2.7
Additional Comments	Exempt species in DCP 2014	Retainable	Tall thin form, with no realistic potential of improvement	Retainable	Retainable					

Tree No	51	52	53	54	55	56	57	58	59	60
Species	<i>Casuarina cunninghamiana</i>	<i>Casuarina cunninghamiana</i>	<i>Syzygium luehmannii</i>	<i>Jacarandar mimosifolia</i>	<i>Acer palmatum</i>	<i>Corymbia citriodora</i>				
DBH (mm)	200	120	150	80	200	150	250	350	1x 150 2x 100	550
RCD (mm)	250	150	180	200	250	180	350	500	200	750
Height (m)	18	13	13	13	13	16	16	17	8	32
Canopy Spread (m)	N	0	3	8				6	6	15
	S	6	0	8				9	5	0
	E	1	0	5				4	5	8
	W	3	3	5				7	5	8
Age Class	S/M	S/M	M	M	M	M	M	M	M	M
Canopy Type Direction	S	S	Codominant hedgerow					D	U	S
Health	A	A	A	A	A	A	A	A	A	L
Condition	F	F	A	A	A	A	A	A	A	P
Amenity	L	L	M	M	M	M	M	L	L	M
Prominence	L	L	M	M	M	M	M	L	L	L
Ecological	M	M	M	M	M	M	M	L	L	L
Significance Value										
Retention Value	<15	<15	>40	>40	>40	>40	>40	>40	>40	0
SULE	Z8	Z8	A1	A1	A1	A1	A1	A1	A1	Z4
TPZ (m)	2.4	1.4	1.8	1.0	2.4	1.8	3.0	4.2	3.5	X
SRZ (m)	1.8	1.5	1.6	1.7	1.8	1.6	2.1	2.5	1.7	X
Additional Comments	Tall thin form, with no realistic potential of improvement	Tall thin form, with no realistic potential of improvement	Retainable	Retainable	Retainable	Retainable	Retainable	Retainable	Retainable	Dieback of 3rd & 4th order branches, evidence of root decay, 25° lean to North





Tree No	81	82	83	84	85	86	87	88	89	90
Species	<i>Melaleuca quinquenervia</i>	<i>Acmena smithii</i>	<i>Acer saccharinum</i>	<i>Acer saccharinum</i>	<i>Liquidambar styraciflua</i>	<i>Arbutus unedo</i>	<i>Palm</i>	<i>Cupressus sempervirens</i>	<i>Cupressus sempervirens</i>	<i>Cupressus sempervirens</i>
DBH (mm)	300	750	2x 300 3x 150	3x 200 3x 150	900	350	2x 150	2x 300	2x 300	2x 300
RCD (mm)	400	900	600	850	1100	400	2x 250	650	450	650
Height (m)	16	20	15	12	22	8	8	12	10	12
Canopy Spread (m)	N	3	13	7	7	15	2	2	3	
	S	7	2	8	7	13	6	2	3	
	E	7	7	7	8	16	4	2	1.5	
	W	0	10	3	2	16	0	2	1.5	
Age Class	M	M	M	M	M	M	M	M	O/M	M
Canopy Type Direction	C/E	C/E	C	C	D	U	C	C	C	C
Health	A	A	A	A/F	A	A	A	A	A	F
Condition	F-P	A	A	F	F	F-P	A	A	A	A
Amenity	M	M	M	M	M	L	L	M	M	M
Prominence	L	L	L	L	L	L	L	L	L	L
Ecological	L	M	L	L	L	L	L	L	L	L
Significance Value										
Retention Value	0	>40	>40	<15	0	0	>40	<40	<40	<40
SULE	Z6	A1	A1	Z8	Z5	Z12	A1	A1	A1	A1
TPZ (m)	x	9.0	11.5	10.5	x	x	2.0	6.0	6.0	6.0
SRZ (m)	x	3.2	2.7	3.1	x	x	1.0	2.8	2.4	2.8
Additional Comments										

Tree No	91	92	93	94	95	96	97	98	99	100	
Species	<i>Lagerstroemia indica</i>	<i>Jacaranda mimosifolia</i>	<i>Photinia robusta</i>	<i>Photinia robusta</i>	<i>Magnolia</i>	<i>Camellia sasanqua</i>	<i>Camellia sasanqua</i>	<i>Bauhinia variegata</i>	<i>Hedera helix</i>	<i>Melaleuca decora</i>	
DBH (mm)	multi	500	1x 200 2x 150	6x 100	250/200 2x 150	multi	multi	300	N/A	300	
RCD (mm)	500	700	400	400	600	400	400	400	N/A	400	
Height (m)	12	14	10	10	9	5	5	13	3	14	
Canopy Spread (m)	N	0	8	7		5	4	4	6	x	8
	S	7	7	6		5	4	4	5	x	0
	E	6	7	5		5	4	4	7	x	4
	W	6	6	5		5	4	4	2	x	5
Age Class	M	O/M	M	M	M	M	M	M	x	M	
Canopy Type Direction	M	D	C	C	C	C	C	S	x	C/E	
Health	A	F	A	A	A	A	A	A	x	A	
Condition	A	P	A	A	A	A	A	F	x	P	
Amenity	M	M	M	M	M	M	M	M	x	M	
Prominence	L	L	L	L	L	L	L	L	x	L	
Ecological	L	L	L	L	L	L	L	L	x	M	
Significance Value											
Retention Value	>40	0	>40	>40	>40	>40	>40	<40	0	0	
SULE	A1	Z5	A1	A1	A1	A1	A1	A1	Z2	Z6	
TPZ (m)	4.0	X	5.0	6.0	7.5	3.6	3.6	3.6	x	X	
SRZ (m)	2.5	X	2.3	2.3	2.7	2.3	2.3	2.3	x	X	
Additional Comments		Two codominant 1st order branches with a weak junction @ 2m high on the main trunk							Climbing plant	Significant asymmetrical canopy towards the north	

Tree No	101	102	103	104	105	106	107	108	109	110
Species	<i>Morus nigra</i>	<i>Cinnamomum camphora</i>	<i>Cinnamomum camphora</i>	<i>Cinnamomum camphora</i>	<i>Lagerstroemia indica</i>	<i>Ligustrum lucidum</i>	<i>Lagunaria patersonia</i>	<i>Cinnamomum camphora</i>	<i>Ligustrum lucidum</i>	<i>Ligustrum lucidum</i>
DBH (mm)	150	5x 100	2x 200	5x 150	multi	200	3x 100	250/350	200	120/200
RCD (mm)	350	600	600	600	500	250	250	700	350	400
Height (m)	8	18	18	20	10	x	x	16	x	12
Canopy Spread (m)	N	5	10		0	x	4	x	x	x
	S	0	12		6	x	4	x	x	x
	E	6	6		4	x	4	x	x	x
	W	1	8		6	x	4	x	x	x
Age Class	M	S/M	S/M	S/M	M	x	x	M	x	x
Canopy Type Direction	E	C	C	C	E	x	x	C	x	x
Health	A	A	A	A	A	x	x	A	x	x
Condition	F	P	P	P	F	x	x	A	x	x
Amenity	L	M	M	M	M	x	x	M	x	x
Prominence	L	L	L	L	L	x	x	L	x	x
Ecological	L	L	L	L	L	x	x	L	x	x
Significance Value										
Retention Value	0	0	0	0	0	0	0	0	0	0
SULE	<b>Z8</b>	<b>Z8</b>	<b>Z8</b>	<b>Z8</b>	<b>Z5</b>	<b>Z1</b>	<b>Z1</b>	<b>Z1</b>	<b>Z1</b>	<b>Z1</b>
TPZ (m)	x	x	x	x	x	x	x	x	x	x
SRZ (m)	x	x	x	x	x	x	x	x	x	x
Additional Comments		Opportunistic weeds with multi-stemmed habits	Opportunistic weeds with multi-stemmed habits	Opportunistic weeds with multi-stemmed habits	Codominant on root crown with No. 116	Codominant on root crown with No. 115. Exempt species in DCP 2014	Exempt species in DCP 2014	Opportunistic weeds with multi-stemmed habits – within 2m of dwelling	Exempt species in DCP 2014	Exempt species in DCP 2014

Tree No	111	112	113	114	115	116	117	118	119	120	121	
Species	<i>Ligustrum lucidum</i>	<i>Ligustrum lucidum</i>	<i>Ligustrum lucidum</i>	<i>Magnolia</i>	<i>Camellia sasanqua</i>	<i>Lophostemon conferta</i>						
DBH (mm)	200	200	250	Multi	4x 150	650	200	600	450	2x 400	400	
RCD (mm)	300	300	350	500	400	750	300	750	600	700	500	
Height (m)	x	x	x	8	7	13	9	16	13	13	11	
Canopy Spread (m)	x	x	x	X	4	4	6	3	6	6	6	5
	x	x	x	X	4	4	6	4	5	5	6	4
	x	x	x	X	4	4	6	4	6	6	6	3
	x	x	x	X	4	4	6	4	6	6	6	4
Age Class	x	x	x	M	M	M	M	M	M	M	M	
Canopy Type Direction	x	x	x	U	U	Codominant Street Trees						
Health	x	x	x	A	F	A	A	A	A	A	A	
Condition	x	x	x	A	F	A	A	A	A	A	A	
Amenity	x	x	x	M	M	M	M	M	M	M	M	
Prominence	x	x	x	L	L	M	M	M	M	M	M	
Ecological	x	x	x	L	L	L	L	L	L	L	L	
Significance Value												
Retention Value	0	0	0	>40	>40	>40	>40	>40	>40	>40	>40	
SULE	Z1	Z1	Z1	A1	A1	A1	A1	A1	A1	A1	A1	
TPZ (m)	x	x	x	4.0	4.0	4.0	2.4	7.2	5.4	8.0	4.8	
SRZ (m)	x	x	x	2.5	2.3	2.9	2.0	2.9	2.7	2.8	2.5	
Additional Comments	Exempt species in DCP 2014	Exempt species in DCP 2014	Exempt species in DCP 2014	Retainable	Retainable	Street tree						



