

# ADVANCED TREESCAPE CONSULTING

## AQF5 ARBORICULTURIST & HORTICULTURIST

☎ 02 4340 2964    📞 0408 439 186    📧 [advancedtreescape@bigpond.com](mailto:advancedtreescape@bigpond.com)  
📮 PO Box 7192 Kariong NSW 2250

ABN: 30 138 200 388



# Arboricultural Impact Assessment

Medowie Christian School  
6, 6A & 6B Waropara Rd  
MEDOWIE NSW 2318

requested by  
EPM Projects Pty Ltd

prepared by  
Russell Kingdom  
Qualified AQF5

02/10/2015

Principal: Russell Kingdom

Fully Insured: Public Liability \$20M, Professional Indemnity \$5M & Personal Accident.  
Advanced Treescape Consulting is committed to providing a safe working environment for its employees in accordance with The Occupational Health & Safety Act NSW 2000.



## TABLE OF CONTENTS

Table of Contents .....	2
Table of Figures .....	2
1.0 Proposal .....	3
2.0 Scope of Report .....	3
3.0 Site Inspection .....	3
3.1 Site Assessment .....	3
4.0 Method of Assessment.....	4
5.0 Tree Schedule .....	4
5.1 Assessment of VTA, Recommendations of Impact & Tree Protection Measures required by Proposed Plans.....	5
5.2 Discussion.....	20
5.3 Tree Significance (Appendix 5).....	20
5.4 Identify Further Potential Impacts on Trees by Proposed Plans .....	20
5.5 Tree Protection Zones using AS4970-2009 .....	21
6.0 Tree Protection Works.....	21
6.1 Tree Works.....	21
6.2 Works Prior to Demolition .....	21
6.3 Works During Demolition .....	21
6.4 Earthworks .....	21
6.5 Construction Works.....	22
6.6 Landscaping Phase.....	22
7.0 Conclusions .....	22
8.0 Recommendations.....	22
Disclaimer.....	23
Reference List.....	24
Appendix 1: Site Plan with Trees and Existing Development .....	25
Appendix 1a: Site Plan with Trees and Existing Development .....	26
Appendix 1b: Site Plan with Trees and Existing Development .....	27
Appendix 1c: Site Plan with Trees and Existing Development.....	28
Appendix 1d: Site Plan with Trees and Proposed Development .....	29
Appendix 1e: Site Plan with Trees and Proposed Development .....	30
Appendix 1f: Stormwater Plan with Trees .....	31
Appendix 2: Digital Images.....	32
Appendix 3: Tree Schedule.....	34
Appendix 4: Notes on Tree Assessment .....	44
Appendix 5: Rating System for Tree Significance .....	46
Table 1.0 Tree Retention Value - Priority Matrix.....	47
Appendix 6: Extract from AS4970-2009 Protection of trees on development sites, Section 3, Determining the tree protection zones of the selected trees, 3.1 Tree protection zone (TPZ) .....	48
Appendix 7: Extract from AS4970-2009 Protection of trees on development sites, Section 3, Determining the protection zones of the selected trees, 3.3.5 Structural root zone (SRZ) .....	50
Table 2.0 TPZ and SRZ Table.....	52
Appendix 8: Tree Protection Zones – Standard Procedure .....	53
Appendix 9: Tree Protection on Construction Sites.....	58
Appendix 10: Glossary .....	66
Appendix 11: SULE.....	67
Appendix 12: Curriculum Vitae.....	68
Conference Attendance & Training.....	68
Business Achievement.....	69
Industry Background .....	69
Memberships.....	69

## TABLE OF FIGURES

Figure 1: Tree 111.....	32
Figure 2: Tree 111.....	32
Figure 3: Tree 111.....	32
Figure 4: Tree 111.....	32
Figure 5: Tree 111.....	33
Figure 6: Tree 111.....	33
Figure 7: Tree 115.....	33

## 1.0 Proposal

EPM Projects Pty Ltd on behalf of Medowie Christian School, has commissioned Advanced Treescape Consulting to prepare an Arboricultural Impact Assessment at Medowie Christian School, 6, 6A & 6B Waropara Road, Medowie. This site is located in the Port Stephens Local Government Area where there is a Tree Preservation Order in force.

It is proposed to carry out alterations and additions to the existing educational establishment as part of a concept proposal and construct a new administration building as part of Stage 1.

The subject site was inspected on 03/08/2015. The plans supplied are from 'smith+tracey architects'. The site plan in Appendix 1 illustrates the location of all surveyed trees.

This assessment has been carried out by Russell Kingdom: Graduate Diploma of Horticulture, Diploma of Horticulture, Diploma of Horticulture/Arboriculture - AQF5 (see Appendix 12).

## 2.0 Scope of Report

Assess the trees on site and the impact of the proposed development on the trees to be retained then make recommendations to ensure the impact on the retained trees is acceptable and complies with AS4970-2009 *Protection of trees on development sites*.

## 3.0 Site Inspection

This site is a primary and secondary school. The land slopes gently from the south-west to the north-east.

There are selected remnant trees retained within the grounds. These are mainly in a group at the front of the school and around the eastern and southern boundaries.

The soil texture was observed to be clay-based Medowie soils<sup>1</sup>. Medowie soil limitations are: seasonal waterlogging (localised, lower slopes), water erosion hazard (localised), strongly acid soils with low inherent fertility and high potential aluminium toxicity.

Drainage characteristics are considered to be good.

### 3.1 Site Assessment

- The microclimate is considered good as all trees appear to have reached their genetic potential.
- There are no re-reflected heat load issues.
- There are no sunlight level issues.
- There is no irrigation visible on site.
- The site is exposed to all winds.

---

<sup>1</sup> Matthei (1995) - Newcastle

## 4.0 Method of Assessment

An **objective visual inspection** was made from the ground of the health and condition of the trees based upon the *Visual Tree Assessment* (VTA) technique described by Mattheck, Breloer (1994). The Tree Schedule (provided in Appendix 3) was based upon:

- Estimation of tree heights by Silva Clinomaster/Heightmeter™ plus visual estimates of canopy spreads.
- Distances of trees, etc. are measured using a Leica Disto™ D2 Laser Distance Meter.
- All digital images which appear in this report are unaltered originals which were taken during site inspection (see Appendix 2).
- Hazard ratings for all trees (see Appendix 4) refer to Failure Potential, Size of Defective Part & Target Rating = Hazard Rating is out of 12.
- Significance Rating (see Appendix 5).
- Calculation of Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) using Australian Standards 4970-2009 (AS4970-2009) Protection of trees on development sites (Appendix 6 and 7).
- The application of TPZs and SRZs on sites using Institute of Australian Consulting Arboriculturists (IACA) adapted AS4970-2009 drawings and protocol (Appendix 8 and 9).
- Glossary (see Appendix 10).
- Trees were numbered with aluminium tags for easy identification.

It should be noted that this objective assessment and related VTA assessments are based upon health and condition that were observed at the time of inspection.

The recommendations of this report regarding retention, works or removal are based upon Safe & Useful Life Expectancy (SULE – see Appendix 11) and hazard ratings being applied.

This information has guided the conclusions in this report.

## 5.0 Tree Schedule

Appendix 3 summarises existing trees upon the site in terms of species, height and canopy spread, structural condition, health, hazard rating and SULE.

Appendix 4 provides explanations of abbreviations and assessment criteria.

The trees contained within the Tree Schedule (see Appendix 3) range from having short to long SULEs. These trees also have a broad range of hazard ratings which limits the retention of such trees within development sites.

## 5.1 Assessment of VTA, Recommendations of Impact & Tree Protection Measures required by Proposed Plans

Accepted tree management practices recommend removal of trees where SULE ratings are 3 or 4, and/or where hazard ratings are high (where ratings adapted from Matheny and Clark range from low=3 to dangerous=12). A detailed explanation of SULE ratings is provided in Appendix 11. Height/Diameter Ratio should not exceed 1:30 (Mattheck, Breloer 1994)

**For Tree Protection Zones for each of the following trees refer to Clause 6.0 or Appendix 6 and 7. It should be noted that distance stated is a radius not a diameter. AS4970 states that an intrusion for the TPZ of less than 10% is considered minor. No intrusion into the TPZ is to exceed 20% of total TPZ area.**

**Note that:**

- 1. = VTA Assessment**
- 2. = Impact of proposed plan**
- 3. = TPZ Measures**

**Tree 1:** *Corymbia gummifera* (Red Bloodwood)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.5m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 2:** *Eucalyptus signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.1m, with an SRZ of 2.7m. It is in fair health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 3:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 7.6m, with an SRZ of 3.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 4:** *Angophora costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.6m, with an SRZ of 2.3m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 5:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.3m, with an SRZ of 2.5m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 6:** *Eucalyptus globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.1m, with an SRZ of 2.3m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 7:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.6m, with an SRZ of 2.6m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 8:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.8m, with an SRZ of 2.3m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 9:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.0m, with an SRZ of 2.0m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 10:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.9m, with an SRZ of 2.5m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 11:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.6m, with an SRZ of 2.1m. It is in good and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 12:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.6m (66.48m<sup>2</sup>), with an SRZ of 2.3m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 13:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.9m, with an SRZ of 2.5m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 14:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.4m, with an SRZ of 2.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 15:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.8m, with an SRZ of 2.3m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 16:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.9m, with an SRZ of 3.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 17:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.1m, with an SRZ of 2.1m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 18:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.8m, with an SRZ of 2.6m. It is in poor health, but fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 19:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.3m, with an SRZ of 2.4m. It is in fair health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 20:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.0m, with an SRZ of 2.9m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 21:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.6m, with an SRZ of 2.3m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 22:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.2m, with an SRZ of 2.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 23:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.4m, with an SRZ of 1.9m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 24:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.5m, with an SRZ of 2.6m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 25:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.6m, with an SRZ of 2.1m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 26:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.4m, with an SRZ of 2.0m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 27:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.9m, with an SRZ of 2.1m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 28:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.3m, with an SRZ of 1.9m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 29:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.8m, with an SRZ of 2.4m. It is in good health and fair structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 30:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.2m, with an SRZ of 2.7m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 31:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.8m, with an SRZ of 2.1m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.



**Tree 32:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.9m, with an SRZ of 2.3m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 33:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.2m, with an SRZ of 2.4m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 34:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 2.3m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 35:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.3m, with an SRZ of 2.5m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 36:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.6m, with an SRZ of 2.3m. It is in fair health and good structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 37:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.2m, with an SRZ of 2.0m. It is in good health and fair structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 38:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.8m, with an SRZ of 2.6m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 39:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.4m, with an SRZ of 2.5m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 40:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.4m, with an SRZ of 2.1m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 41:** *Sapium sebiferum* (Chinese Tallow)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.6m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 42:** *S. sebiferum* (Chinese Tallow)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.5m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 43:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.0m, with an SRZ of 2.1m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 44:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.4m, with an SRZ of 2.0m. It is in good health and structural condition. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 45:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.8m, with an SRZ of 2.1m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 46:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.0m, with an SRZ of 2.1m. It is in good health and fair structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 47:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.5m, with an SRZ of 2.3m. It is in good health and fair structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 48:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.9m, with an SRZ of 2.1m. It is in good health and fair structural condition. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 49:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.5m, with an SRZ of 2.0m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 50:** *S. sebiferum* (Chinese Tallow)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 51:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.1m, with an SRZ of 2.1m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8. N/A.

**Tree 52:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.0m, with an SRZ of 2.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 53:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.6m, with an SRZ of 2.2m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 54:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.2m, with an SRZ of 2.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 55:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.8m, with an SRZ of 2.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 56:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.5m, with an SRZ of 2.1m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 57:** *Acacia spp.* (Wattle)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.6m, with an SRZ of 1.9m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 58:** *Callistemon viminalis* (Weeping Bottlebrush)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 59:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.4m, with an SRZ of 1.8m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 60:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.5m, with an SRZ of 2.1m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 61:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.0m, with an SRZ of 2.3m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 62:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.3m, with an SRZ of 1.8m. It is in good health and structural condition. This tree lies within the proposed stormwater detention dam and has an unacceptable impact on its TPZ (see Appendix 1f). Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 63:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.8m, with an SRZ of 1.9m. It is in good health and fair structural condition. This tree lies within the proposed stormwater detention dam and has an unacceptable impact on its TPZ (see Appendix 1f). Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 64:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.6m, with an SRZ of 2.4m. It is in good health and structural condition. This tree lies within the proposed stormwater detention dam and has an unacceptable impact on its TPZ (see Appendix 1f). Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 65:** *Eucalyptus pilularis* (Blackbutt)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.0m, with an SRZ of 2.4m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 66:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.8m, with an SRZ of 2.1m. It is in fair health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 67:** *E. pilularis* (Blackbutt)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 6.5m, with an SRZ of 2.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 68:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.6m, with an SRZ of 2.2m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 69:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.3m, with an SRZ of 2.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 70:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.5m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 71:** *E. pilularis* (Blackbutt)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.5m, with an SRZ of 2.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 72:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.6m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 73:** *E. pilularis* (Blackbutt)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 6.0m, with an SRZ of 2.8m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 74:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.8m, with an SRZ of 2.5m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 75:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 5.5m, with an SRZ of ?m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 76:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.8m, with an SRZ of 2.3m. It is in good and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 77:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.8m, with an SRZ of 1.9m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 78:** *E. pilularis* (Blackbutt)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 6.2m, with an SRZ of 3.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 79:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.4m, with an SRZ of 1.9m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 80:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.2m, with an SRZ of 2.1m. It is in fair health and structural condition. Removal is recommended to facilitate the proposed development.
3. No TPZ fence is required.

**Tree 81:** *Hymenosporum flavum* (Native Frangipani)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.5m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 82:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.7m, with an SRZ of 2.8m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 83:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.6m, with an SRZ of 2.4m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 84:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 6.1m, with an SRZ of 2.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 85:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.1m, with an SRZ of 2.1m. It is in health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 86:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.9m, with an SRZ of 2.4m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 87:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.5m, with an SRZ of 2.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 88:** *Allocasuarina littoralis* (Black She-Oak)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.7m. It is in poor health but fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 89:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.7m, with an SRZ of 2.3m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 90:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.1m, with an SRZ of 2.1m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 91:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.6m, with an SRZ of 2.4m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 92:** *C. gummifera* (Red Bloodwood)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.5m, with an SRZ of 1.8m. It is in fair health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 93:** *A. littoralis* (Black She-Oak)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.6m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.



**Tree 94:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.2m, with an SRZ of 1.8m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 95:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 96:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.7m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 97:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.1m, with an SRZ of 2.5m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 98:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.7m, with an SRZ of 2.4m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 99:** *C. gummifera* (Red Bloodwood)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.8m, with an SRZ of 2.4m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 100:** *C. gummifera* (Red Bloodwood)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.9m, with an SRZ of 2.0m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 101:** *E. signata* (Scribbly Gum)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 3.8m, with an SRZ of 2.3m. It is in good health and fair structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 102:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.9m, with an SRZ of 2.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 103:** *A. littoralis* (Black She-Oak)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.7m. It is in fair health and good structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 104:** *C. gummifera* (Red Bloodwood)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.2m, with an SRZ of 1.7m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 105:** *A. costata* (Smooth-barked Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.9m, with an SRZ of 2.0m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. No TPZ fence is required.

**Tree 106:** *S. sebiferum* (Chinese Tallow)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.6m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 107:** *S. sebiferum* (Chinese Tallow)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.6m. It is in good health and structural condition. This tree is not impacted by the proposed development and is to be retained.
3. TPZ fence is required as per Appendix 8.

**Tree 108:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.5m, with an SRZ of 2.0m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 109:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 4.1m, with an SRZ of 2.3m. It is in fair health and good structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 110:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.6m, with an SRZ of 2.2m. It is in fair health and good structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 111:** *Angophora subvelutina* (Broad-leaved Apple)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 6.1m, with an SRZ of 2.9m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 112:** *E. globoidea* (White Stringybark)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.5m, with an SRZ of 2.0m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 113:** *Elaeocarpus reticulatus* (Blueberry Ash)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of m, with an SRZ of m. It is in health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 114:** *Lophostemon confertus* (Brushbox)

1. This tree passes the VTA. It is suitable to be considered for retention.
2. This tree has a full TPZ of 2.0m, with an SRZ of 1.6m. It is in good health and structural condition. This tree lies within the proposed building footprint or has an unacceptable impact from the proposed building. Removal is recommended to facilitate the proposed development.
3. N/A.

**Tree 115:** *S. sebiferum* (Chinese Tallow)

1. This tree fails the VTA (refer to Appendix 3 for details). It is not suitable to be considered for retention.
2. N/A.
3. N/A.

## 5.2 Discussion

The proposed building will require the removal of 29 trees out of 115 trees on the site.

The position of the building has been carefully located to ensure the least possible number of trees to be removed and there are no other options for the location of the construction.

### **TREES IMPACTED BY THE PROPOSED DEVELOPMENT AND RECOMMENDED FOR REMOVAL:**

29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 62, 63, 64, 107, 108, 109, 110, 111, 112, 113, 114 and 115 =32 Trees.

### **TREES TO BE RETAINED:**

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105 and 106 = 83 trees.

## 5.3 Tree Significance (Appendix 5)

The trees listed in this report are of medium to high significance. Many of the trees on the site are species listed in the Port Stephens Council Comprehensive Koala Plan of Management (CKPoM) and locally endemic species.

## 5.4 Identify Further Potential Impacts on Trees by Proposed Plans

- It would be preferable that no fill soils be used in any TPZ unless approved by the Port Stephens Council.
- Soil cuts should be kept to a minimum near any TPZ unless approved by the Port Stephens Council.
- Services should not be located in or run through any TPZ unless approved by the Port Stephens Council.
- Site Office/Toilet, etc., are not to be located in any TPZ unless approved by the Port Stephens Council.
- Materials are to be stored away from any TPZ unless approved by the Port Stephens Council.
- Aeration of the soil is managed by the TPZ fencing.
- An area is to be set aside for tradespeople to wash down equipment away from any TPZ. The location of the wash down point should be approved by the Consultant Arboriculturist unless approved by the Port Stephens Council.

## 5.5 Tree Protection Zones using AS4970-2009<sup>2</sup>

DBH – Diameter at Breast Height (1.4 metres)

DGL – Diameter at Ground Level

TPZ = DBH (stem) x 12 (radius)

SRZ radius =  $(D \times 50)^{0.42} \times 0.64$

See Appendix 6 and Appendix 7

**Refer to Appendix 3 for TPZ and SRZ details**

\* Minimum TPZ is 2 metres – Maximum TPZ is 15 metres

# Minimum SRZ is 1.5 metres

## 6.0 Tree Protection Works

- TPZ fences are to be erected around the retained trees 20-28, 49, 106 & 107 before construction commences (refer to Appendices 8 and 9).
- TPZ fences are required to be erected around trees (even those not directly affected by the proposed development) to prevent vehicles being parked near them and/or the storage of materials or the dumping of fill soil etc. in their TPZs.
- The distance from the tree trunk to the TPZ fence is specified in Appendix 3 and highlighted. N.B: This is a radius, not diameter.
- The TPZ fence is to be constructed of two (2) metres high temporary chain wire fencing. This is preferable to star pickets as it would require them to be hammered into the ground which could damage roots.
- This action will greatly reduce the stress on the trees. The TPZ fence should be left in place until the landscaping phase of construction begins.
- TPZ signage as per Appendix 8 to be attached to TPZ fencing.

## 6.1 Tree Works

Any tree work is to be carried out by a suitably qualified and insured Arborist. (AQF 3) to AS4373-2007 *Pruning of amenity trees*.

## 6.2 Works Prior to Demolition

TPZ fencing to be erected around retained trees as per Appendix 8.

## 6.3 Works During Demolition

There are no tree works to be carried out during demolition.

## 6.4 Earthworks

There will be earthworks to level the site. Any tree roots encountered within the works area need to be correctly terminated, which is cut by a hand saw and not smashed off with a backhoe bucket. Correctly terminating a root will ensure that the tree roots do not suffer from decay.

---

<sup>2</sup> AS4970-2009 *Protection of trees on development sites*.

## 6.5 Construction Works

TPZ fencing to remain in place during construction.

## 6.6 Landscaping Phase

The TPZ fencing may be removed during the Landscaping Phase.

All trees removed should, where practicable, be replaced at the landscaping phase as part of the proposed Development Application (DA).

At the landscaping phase the retained trees will not be impacted.

## 7.0 Conclusions

The position of the building has been carefully located to ensure the least possible number of trees to be removed and there are no other practical options for the location of the construction.

Suitable replacement trees are to be included in the landscape plan. These replacement trees will ensure the long-term amenity and address issues associated with the Port Stephens Council Comprehensive Koala Plan of Management (CKPoM).

## 8.0 Recommendations

Implement all recommendations contained in Clauses 5.1, 5.2, 5.4, 5.5, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5 and 6.6.

**Reason:** These recommendations have been developed in accordance with AS4970-2009 to reduce the impact of the proposed development on the retained trees.

The trees to be removed have been assessed as being unsuitable to be considered for retention or they have an unacceptable impact from the proposed development.



Russell Kingdom

AQF5 Arboriculturist & Horticulturist

MIACA MAIH MAA

Graduate Diploma of Horticulture

Diploma of Horticulture

Diploma of Horticulture/Arboriculture

## DISCLAIMER

The author and Advanced Treescape Consulting take no responsibility for actions taken and their consequence if contrary to those expert and professional instructions given as recommendations pertaining to safety. The conclusions and recommendations contained in this report refer to the tree(s) condition on the inspection day. All care has been taken using the most up-to-date Arboricultural information in the preparation of this report. The report is based on a visual inspection only. Tree health and environmental conditions can change irreversibly at any time due to unforeseen circumstances or events. Due to *Myrtaceae* family hybridisation some tree species are difficult to accurately identify. Unless trees are in full flower identification is only probable.

## REFERENCE LIST

AS 4373-2007 *Pruning of amenity trees*.

AS 4970-2009 *Protection of trees on development sites*.

Barrell, J. (1993-95) '*Pre-planning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression*' Arboricultural Journal Vol. 17, PP 33-46, Academic Publishers, Great Britain.

Costermans, L. F. (1994) *Native Trees and Shrubs of South-eastern Australia* Rev. ed. Landsdowne Publishing Pty Ltd.

Draper, B. D. and Richards, P. A. (2009) *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Harris, R. W.; Clark, J. R. and Matheny, N. P. (2004) *Arboriculture – Integrated Management of Landscape Trees, Shrubs, and Vines*, Fourth Edition, Prentice Hall.

IACA Adapted AS4970 Drawings and Protocol.

Mattheck, C and Breloer, H (1994) *The Body Language of Trees. A Handbook for Failure Analysis*. Research for Amenity Trees, The Stationary Office, London, England.

Matthei, L. E. (1995) *Soil Landscapes of the Newcastle 1:100 000 Sheet*. Department of Land & Water Conservation.

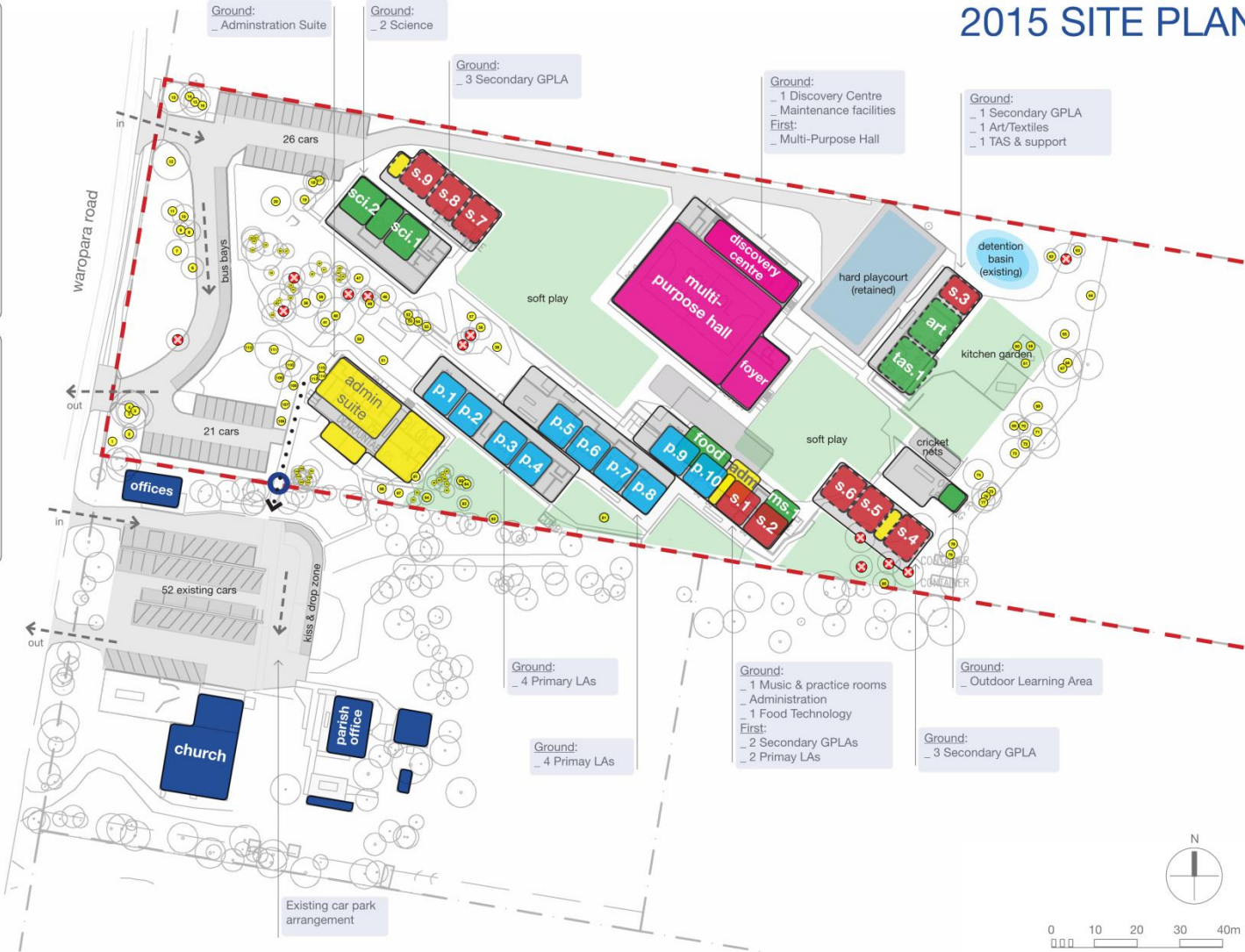


Appendix 1: Site Plan with Trees and Existing Development

Accommodation Projection	
10	Primary School LAs
9	Secondary GPLA
2	Science
1	TAS
1	Music
1	Art
0	Textile
1	Food
25	Total

Car Parking Provision	
44	FTE Staff (1:1) - on school site
3	Y12 students (1:8) - on school site
-	Bus Bays - on school site
-	Kiss & drop zone - on church site
<small>note: Parking provision based on Port Stephens Development Control Plan 2013 - B3 Parking, Traffic &amp; Transport.</small>	

Accommodation Key:	
p.1	Primary School
s.1	Secondary GLA
sci	Specialist Learning
mp	Shared Activities
ad	Administration



Appendix 1a: Site Plan with Trees and Existing Development

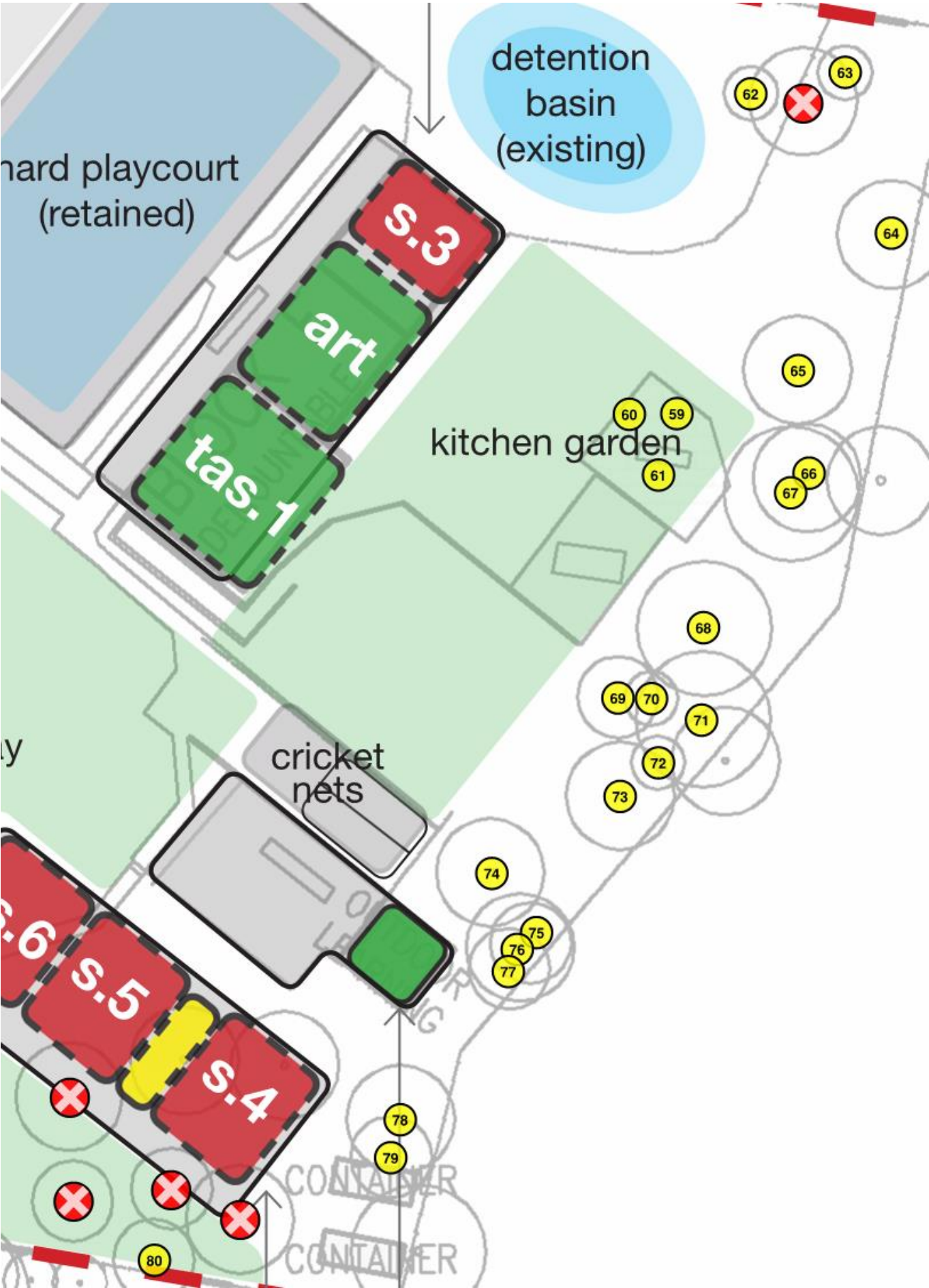


Appendix 1b: Site Plan with Trees and Existing Development

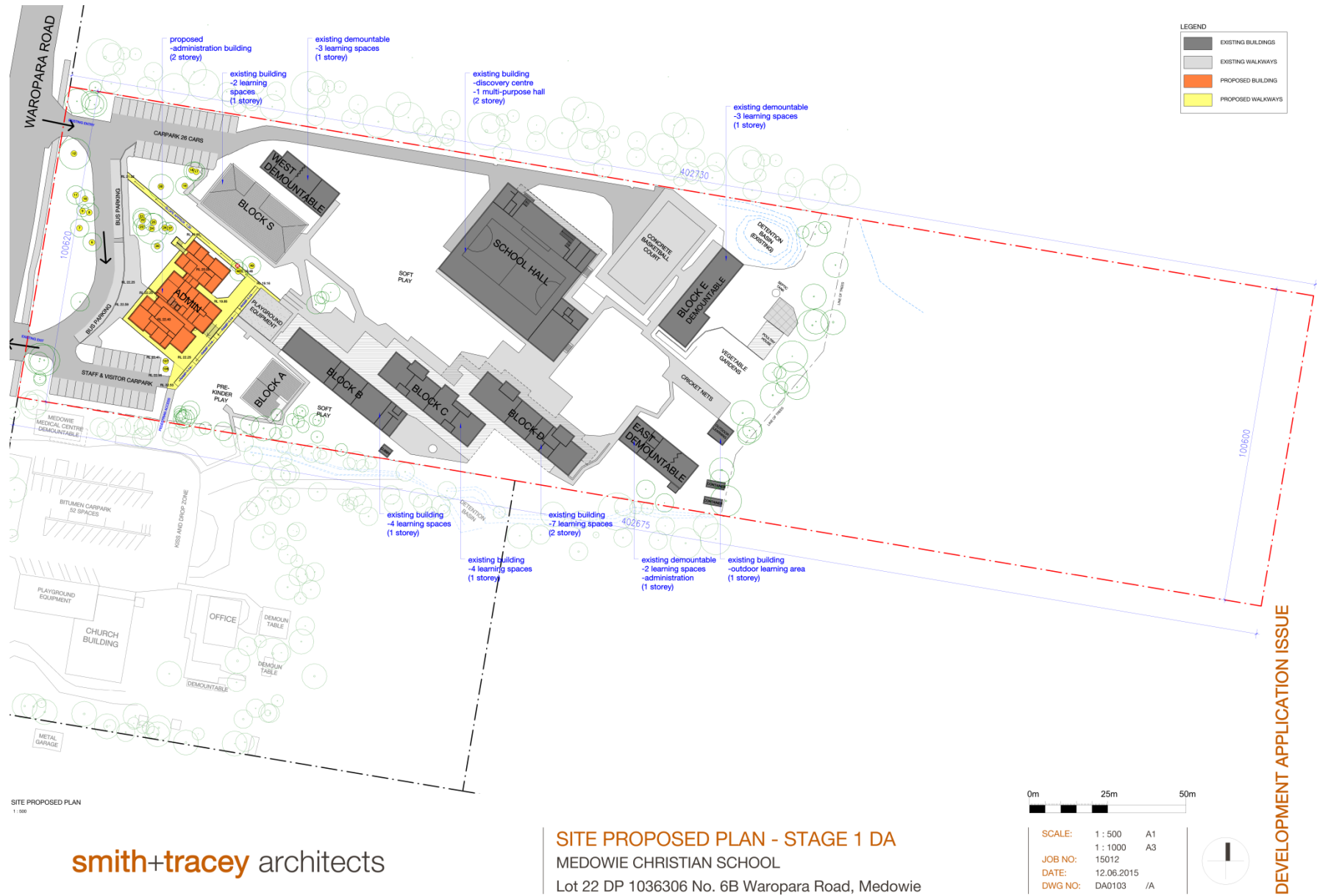




Appendix 1c: Site Plan with Trees and Existing Development

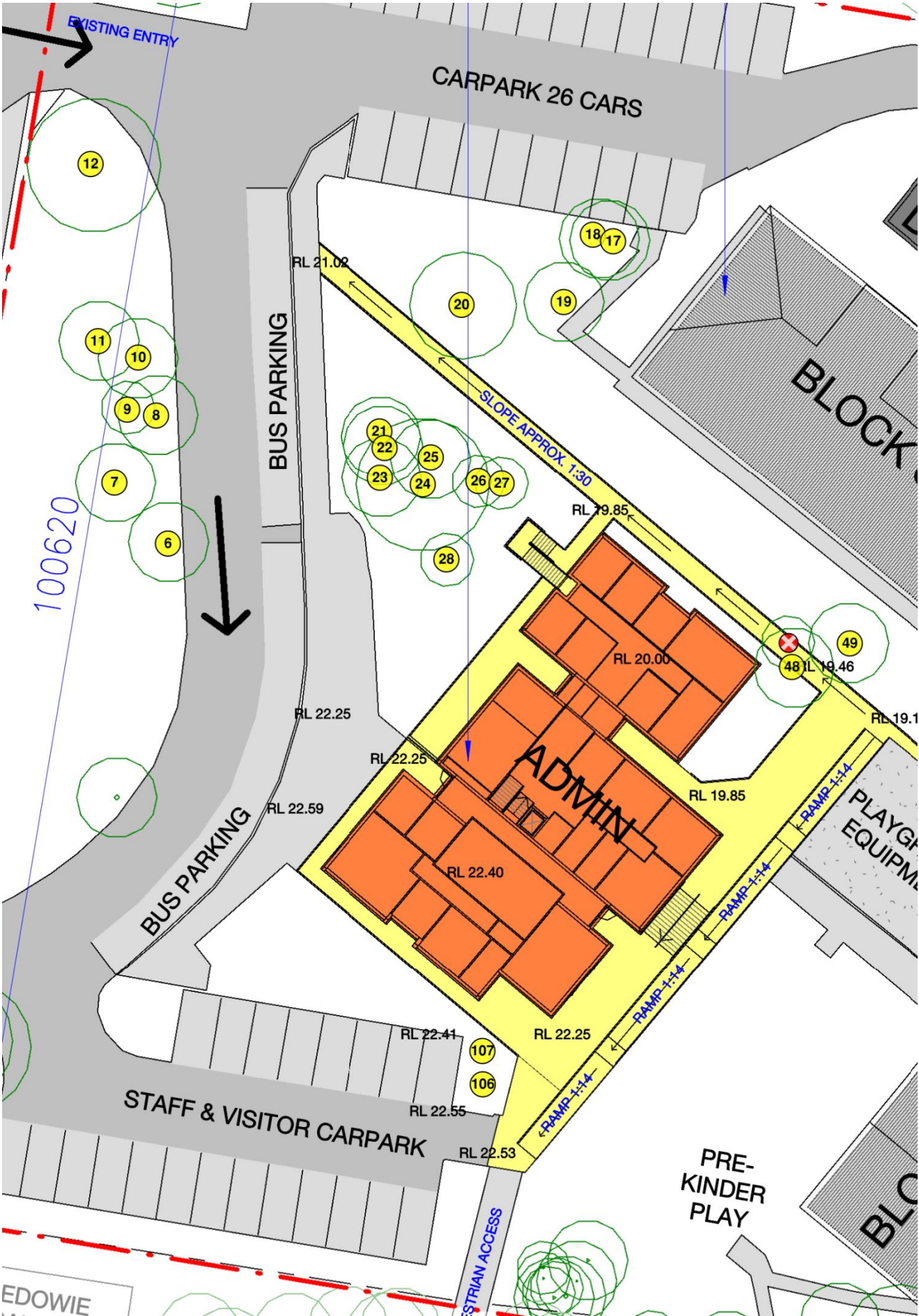


Appendix 1d: Site Plan with Trees and Proposed Development

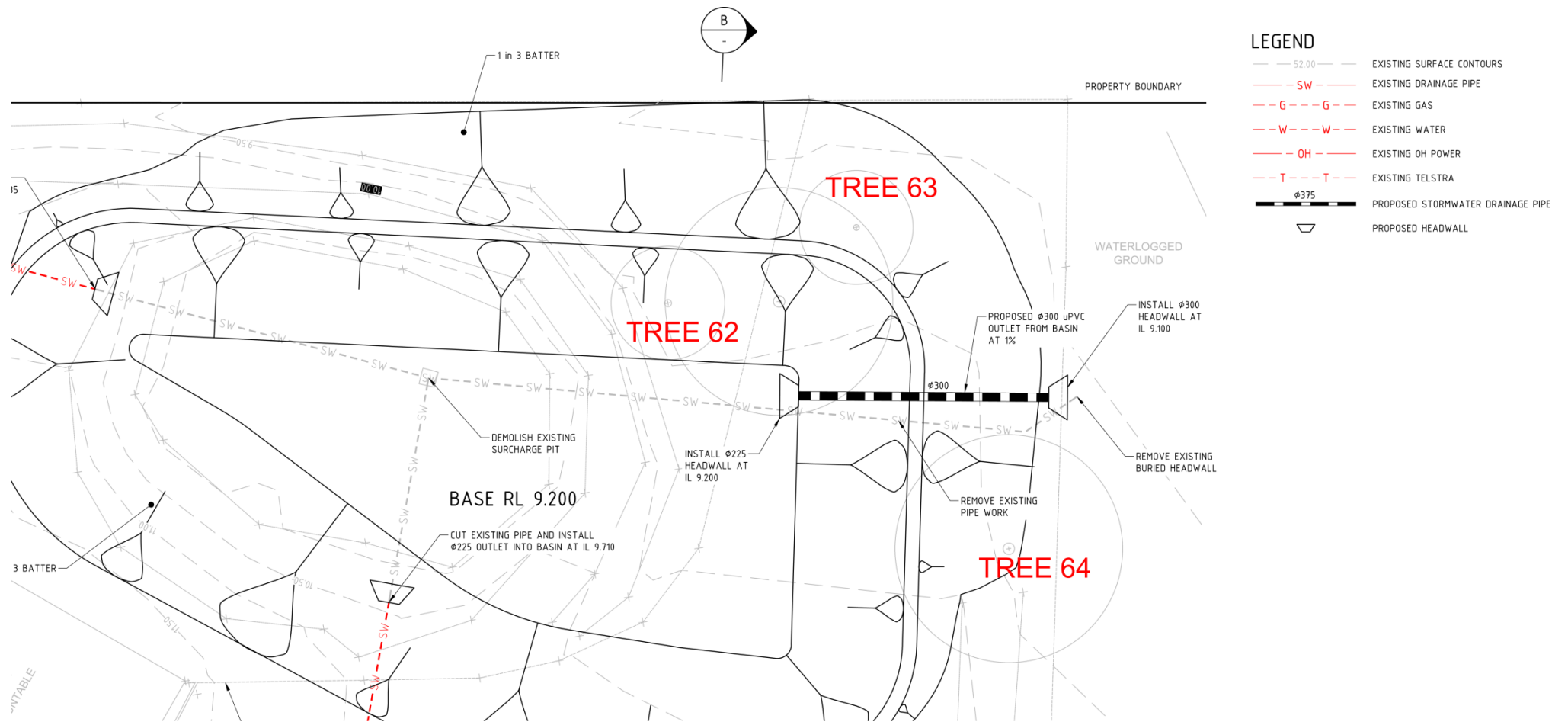




Appendix 1e: Site Plan with Trees and Proposed Development



## ***Appendix 1f: Stormwater Plan with Trees***





## Appendix 2: Digital Images



Figure 1: Tree 111.



Figure 2: Tree 111.



Figure 3: Tree 111.



Figure 4: Tree 111.





Figure 5: Tree 111.



Figure 6: Tree 111.



Figure 7: Tree 115.

### Appendix 3: Tree Schedule

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) Hazard Rating-3=low hazard, 12=dangerous, N/A-not applicable, SULE-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
1	<i>Corymbia gummifera</i> (Red Bloodwood)	12	120	150	2.0	1.5	G	G	1 radial	J	dw.	P	3	2B	S
2	<i>Eucalyptus signata</i> (Scribbly Gum)	14	CD 230 250 (340)	600	4.1	2.7	F	F	6 2 6 1	M	Basal TW@4m, crown suppressed.	P	4	2B	S
3	<i>E. signata</i> (Scribbly Gum)	20	630	760	7.6	3.0	G	G	8 8 8 4	M	Sewer to west (trench), PL to west.	P	4	2B	S
4	<i>Angophora costata</i> (Smooth-barked Apple)	15	300	430	3.6	2.3	G	G	4 4 1 4	YM	1.7m to driveway.	P	4	2B	S
5	<i>A. costata</i> (Smooth-barked Apple)	20	440	500	5.3	2.5	G	G	6 4 8 4	YM	1m to driveway, minor wound in crown, will cause damage to driveway in 5 - 10 years.	P	5	3B	S
6	<i>Eucalyptus globoidea</i> (White Stringybark)	16	340	400	4.1	2.3	F	G	6 radial	M	witches brooms in crown, 900mm to driveway, dw, E.	P	4	2B	S
7	<i>E. signata</i> (Scribbly Gum)	12	380	550	4.6	2.6	G	G	6 radial	M	dw.	P	4	2B	S
8	<i>E. globoidea</i> (White Stringybark)	15	320	440	3.8	2.3	F	G	6 4 6 2	M	Witches brooms, basal TW, TDB.	P	4	2B	S
9	<i>A. costata</i> (Smooth-barked Apple)	15	250	300	3.0	2.0	F	G	1 radial	YM	Sparse canopy.	P	4	2B	S
10	<i>A. costata</i> (Smooth-barked Apple)	18	410	500	4.9	2.5	G	G	8 4 8 4	M	K@8m, dw.	P	4	2B	S
11	<i>A. costata</i> (Smooth-barked Apple)	14	300	360	3.6	2.1	G	G	4 4 - 4	YM	dw.	P	4	2B	S



**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) Hazard Rating-3=low hazard, 12=dangerous, N/A-not applicable, SULE-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
12	<i>E. signata</i> (Scribbly Gum)	16	380	440	4.6	2.3	G	G	6 6 8 6	M	Fill soil in SRZ, dw, hanger (small).	P	5	2B	S
13	<i>E. signata</i> (Scribbly Gum)	16	410	520	4.9	2.5	G	G	6 6 6 4	M	PL to the west, E.	P	4	2B	S
14	<i>E. signata</i> (Scribbly Gum)	12	200	300	2.4	2.0	G	G	4 1 3 3	YM		P	3	2B	S
15	<i>A. costata</i> (Smooth-barked Apple)	16	320	420	3.8	2.3	G	G	6 - 3 3	M	Tropism to the north.	P	3	2B	S
16	<i>A. costata</i> (Smooth-barked Apple)	16	Multi 3x<100 200 320 (410)	800	4.9	3.0	G	G	8 6 8 4	M	dw, in group.	P	4	2B	S
17	<i>A. costata</i> (Smooth-barked Apple)	16	260	350	3.1	2.1	F	G	6 1 8 1	M	1m to carpark, drain 2m to the east, cut 3m to the east, FA, unbalanced, tropism to the east.	P	5	3B	S
18	<i>E. globoidea</i> (White Stringybark)	18	400	560	4.8	2.6	P	F	6 8 6 6	M	Hangers, termite mud, 1m to carpark, dw, TDB, basal TW, hollow (not H).	P	5	3B	S
19	<i>E. globoidea</i> (White Stringybark)	18	360	450	4.3	2.4	F	F	6 8 6 6	M	1m to footpath, cut 2m to the east, TDB, dw, E.	P	5	3B	S
20	<i>E. signata</i> (Scribbly Gum)	20	420	720	5.0	2.9	G	G	8 8 8 6	M	dw, hangers, RFSs, K in MFU@12m.	P	5	2D	S
21	<i>E. globoidea</i> (White Stringybark)	17	380	440	4.6	2.3	F	G	6 6 6 4	M	Witches brooms, DW, TDB, E, IMFU, crossed branches (with Tree 22), fill at base.	P	4	2B	S
22	<i>E. signata</i> (Scribbly Gum)	15	CD 100 250 (270)	600	3.2	2.7	G	G	6 4 4 1	YM	Basal TW, power trench in SRZ, fill at base.	P	4	2B	S
23	<i>A. costata</i> (Smooth-barked Apple)	10	200	250	2.4	1.9	G	G	1 6 2 1	YM	Fill at base.	P	4	2B	S

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec.-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) Hazard Rating-3=low hazard, 12=dangerous, N/A-not applicable, SULE-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
24	<i>E. globoidea</i> (White Stringybark)	20	460	560	5.5	2.6	G	G	8 8 8 4	M	dw.	P	4	2B	S
25	<i>A. costata</i> (Smooth-barked Apple)	16	220	350	2.6	2.1	G	G	4 - 8 -	YM	Unbalanced canopy, crown suppressed by Tree 24.	P	4	2B	S
26	<i>A. costata</i> (Smooth-barked Apple)	12	200	300	2.4	2.0	G	F	- 2 2 1	YM	Basal decay - was CD, FA.	P	4	2B	S
27	<i>A. costata</i> (Smooth-barked Apple)	14	240	350	2.9	2.1	G	F	3 2 2 -	YM	Burl@4m, FA.	P	4	2B	S
28	<i>A. costata</i> (Smooth-barked Apple)	14	190	260	2.3	1.9	G	F	2 2 2 1	YM	FA.	P	4	2B	S
29	<i>A. costata</i> (Smooth-barked Apple)	20	320	480	3.8	2.4	G	F	2 6 6 1	M	dw, TDB, 600mm to driveway. In building footprint.	P	4	3B	R
30	<i>A. costata</i> (Smooth-barked Apple)	20	430	600	5.2	2.7	G	G	6 4 8 2	M	TW@3m, K, DW. In building footprint.	P	4	2B	R
31	<i>A. costata</i> (Smooth-barked Apple)	14	230	340	2.8	2.1	G	G	6 1 4 4	YM	FA, dw. In building footprint.	P	4	2B	R
32	<i>E. globoidea</i> (White Stringybark)	14	240	400	2.9	2.3	G	G	6 2 4 4	M	E, dw, PFS. In building footprint.	P	4	2B	R
33	<i>A. costata</i> (Smooth-barked Apple)	16	350	450	4.2	2.4	G	G	6 1 4 4	M	In building footprint.	P	4	2B	R
34	<i>A. costata</i> (Smooth-barked Apple)	10	CD 100 110 (150)	400	2.0	2.3	G	G	1 1 2 1	J	E, dw. In building footprint.	P	4	2B	R
35	<i>A. costata</i> (Smooth-barked Apple)	18	360	490	4.3	2.5	G	G	4 2 6 6	M	dw. In building footprint.	P	4	2B	R

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec.-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) Hazard Rating-3=low hazard, 12=dangerous, N/A-not applicable, SULE-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
36	<i>E. globoidea</i> (White Stringybark)	17	300	420	3.6	2.3	F	G	6 2 6 2	M	Cut 4m to the north, dw, TDB, E. In building footprint.	P	4	2B	R
37	<i>A. costata</i> (Smooth-barked Apple)	14	180	300	2.2	2.0	G	F	1 2 2 -	J	Basal TW, FA. In building footprint.	P	4	2B	R
38	<i>E. globoidea</i> (White Stringybark)	20	400	540	4.8	2.6	G	G	6 2 8 4	M	Hangers, RFSs, dw, INFU, E. In building footprint.	P	5	2B	R
39	<i>A. costata</i> (Smooth-barked Apple)	12	CD 150 240 (280)	500	3.4	2.5	G	G	4 radial	YM	In building footprint.	P	4	2B	R
40	<i>A. costata</i> (Smooth-barked Apple)	12	280	360	3.4	2.1	G	G	6 6 8 3	YM	In building footprint.	P	4	2B	R
41	<i>Sapium sebiferum</i> (Chinese Tallow)	6	120	280	2.0	1.6	G	G	2 radial	YM	Surface roots, 1m to footpath. In building footprint.	P	4	3B	R
42	<i>S. sebiferum</i> (Chinese Tallow)	6	80	120	2.0	1.5	G	G	1.5 radial	YM	Surface roots, wet soil, 600mm to footpath. In building footprint.	P	4	3B	R
43	<i>A. costata</i> (Smooth-barked Apple)	12	250	320	3.0	2.1	G	G	6 - 4 -	YM	2m to cut - SRZ impacted, tropism to the north-east, unbalanced, in group. In building footprint.	P	5	2B	R
44	<i>E. signata</i> (Scribbly Gum)	10	200	300	2.4	2.0	G	G	3 1 3 1	YM	dw. In building footprint.	P	4	2B	R
45	<i>E. globoidea</i> (White Stringybark)	12	230	350	2.8	2.1	G	G	4 radial	YM	Basal TW with good callus. In building footprint.	P	4	2B	R
46	<i>A. costata</i> (Smooth-barked Apple)	15	250	320	3.0	2.1	G	F	2 radial	YM	FA, basal TW, good callus. In building footprint.	P	4	2B	R
47	<i>A. costata</i> (Smooth-barked Apple)	16	290	400	3.5	2.3	G	F	6 6 6 2	M	On bank, FA, old TW fully callused. In building footprint.	P	4	2B	R

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) Hazard Rating-3=low hazard, 12=dangerous, N/A-not applicable, SULE-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
48	<i>A. costata</i> (Smooth-barked Apple)	16	240	360	2.9	2.1	G	F	3 2 3 1	YM	On bank, FA. In building footprint.	P	4	2B	R
49	<i>A. costata</i> (Smooth-barked Apple)	14	210	300	2.5	2.0	G	F	2 2 3 2	YM	FA.	P	4	2B	S
50	<i>S. sebiferum</i> (Chinese Tallow)	6	100	200	2.0	1.7	G	G	2 radial	YM	In garden bed.	P	4	2B	S
51	<i>E. signata</i> (Scribbly Gum)	12	260	350	3.1	2.1	G	G	3 radial	YM	In garden bed, PFS, dw.	P	4	2B	S
52	<i>A. costata</i> (Smooth-barked Apple)	12	250	300	3.0	2.0	G	G	4 - 2 2	YM	Tropism to the north.	P	3	2B	S
53	<i>A. costata</i> (Smooth-barked Apple)	15	CD 100 280 (300)	370	3.6	2.2	G	G	6 2 2 4	YM	TW@8m (minor).	P	4	2B	S
54	<i>A. costata</i> (Smooth-barked Apple)	18	CD 160 400 (430)	600	5.2	2.7	G	G	4 radial	M	IMFU@10m, K, vertical leaders.	P	4	2B	S
55	<i>A. costata</i> (Smooth-barked Apple)	14	230	310	2.8	2.0	G	G	3 1 3 1	YM	Basal TW (minor), bark splits (minor).	P	4	2B	S
56	<i>E. signata</i> (Scribbly Gum)	12	290	360	3.5	2.1	G	G	3 1 3 2	YM	dw.	P	4	2B	S
57	<i>Acacia spp.</i> (Wattle)	3	220	250	2.6	1.9	G	G	3 1 3 3	M	dw.	P	3	3B	S
58	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	3	QD 4x50 (100)	200	2.0	1.7	G	G	1 radial	YM	Previously lopped@500mm.	P	3	2B	S
59	<i>A. costata</i> (Smooth-barked Apple)	12	200	240	2.4	1.8	G	G	2 - 1 1	YM	In chicken run, dw.	P	3	2B	S

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) **Hazard Rating-3**=low hazard, **12**=dangerous, **N/A**-not applicable, **SULE**-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
60	<i>A. costata</i> (Smooth-barked Apple)	16	210	340	2.5	2.1	G	F	2 1 - 2	YM	FA	P	4	2B	S
61	<i>A. costata</i> (Smooth-barked Apple)	15	CD 130 210 (250)	440	3.0	2.3	G	G	2 radial	YM	In chicken run, dw, canker in crown (minor).	P	3	2B	S
62	<i>E. globoidea</i> (White Stringybark)	12	190	240	2.3	1.8	G	G	2 radial	YM	dw, E. In building footprint.	P	3	2B	R
63	<i>E. globoidea</i> (White Stringybark)	10	CD 140 180 (230)	250	2.8	1.9	G	F	2 1 3 1	YM	IFUs, E, dw. In building footprint.	P	3	2B	R
64	<i>E. globoidea</i> (White Stringybark)	16	380	450	4.6	2.4	G	G	5 3 4 4	M	Basal TW, good callus, fill soil in TPZ. In building footprint.	P	4	2B	R
65	<i>Eucalyptus pilularis</i> (Blackbutt)	22	420	460	5.0	2.4	G	G	8 4 6 6	YM	E, dw, fill soil in TPZ.	P	4	2B	S
66	<i>E. globoidea</i> (White Stringybark)	16	230	320	2.8	2.1	F	F	2 radial	M	E, DW, TDB, fill around base.	P	5	3B	S
67	<i>E. pilularis</i> (Blackbutt)	20	540	610	6.5	2.7	G	G	4 8 4 6	YM	dw.	P	4	2B	S
68	<i>A. costata</i> (Smooth-barked Apple)	18	220	370	2.6	2.2	G	F	4 2 4 4	YM	FA.	P	4	2B	S
69	<i>A. costata</i> (Smooth-barked Apple)	22	QD 100 140 200 250 (360)	600	4.3	2.7	G	G	6 radial	M	Possibly old coppice, dw.	P	4	2B	S
70	<i>E. globoidea</i> (White Stringybark)	12	100	140	2.0	1.5	F	G	1 radial	J	dw, TDB, E, suppressed.	P	4	3B	S

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) Hazard Rating-3=low hazard, 12=dangerous, N/A-not applicable, SULE-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
71	<i>E. pilularis</i> (Blackbutt)	24	460	620	5.5	2.7	G	G	10 6 6 6	M	dw, E.	P	4	2B	S
72	<i>A. costata</i> (Smooth-barked Apple)	8	110	180	2.0	1.6	G	G	1 radial	J	E.	P	3	2B	S
73	<i>E. pilularis</i> (Blackbutt)	24	CD 200 460 (500)	650	6.0	2.8	G	G	8 radial	M	dw, E.	P	4	2B	S
74	<i>A. costata</i> (Smooth-barked Apple)	20	CD 260 300 (400)	510	4.8	2.5	G	G	8 6 6 6	M	dw, crossed branches, E.	P	4	2B	S
75	<i>A. costata</i> (Smooth-barked Apple)	10	100	460	2.0	2.4	G	G	1 radial	J	Basal decay, old leader, FA.	P	3	2B	S
76	<i>E. globoidea</i> (White Stringybark)	19	320	440	3.8	2.3	G	G	6 4 6 6	M	dw, E.	P	4	2B	S
77	<i>A. costata</i> (Smooth-barked Apple)	12	230	260	2.8	1.9	G	G	- 3 1 2	J	CD@3m, tropism to the south.	P	4	2B	S
78	<i>E. pilularis</i> (Blackbutt)	24	520	800	6.2	3.0	G	G	10 8 8 6	M	dw, E.	P	4	2B	S
79	<i>A. costata</i> (Smooth-barked Apple)	10	200	260	2.4	1.9	G	G	3 2 1 2	J	E.	P	3	2B	S
80	<i>E. globoidea</i> (White Stringybark)	16	180	320	2.2	2.1	F	F	1 4 2 3	YM	FA, concrete drain at base.	P	5	3B	S
81	<i>Hymenosporum flavum</i> (Native Frangipani)	4	100	150	2.0	1.5	F	G	1 radial	J	In plater - struggling.	P	3	3B	S
82	<i>A. costata</i> (Smooth-barked Apple)	20	310	650	3.7	2.8	G	G	6 radial	M	dw, RFS, soil excavated 300mm in TPZ.	P	4	2B	S



**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec.-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) Hazard Rating-3=low hazard, 12=dangerous, N/A-not applicable, SULE-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
83	<i>E. signata</i> (Scribbly Gum)	19	380	460	4.6	2.4	G	G	6 2 6 2	M	dw, soil excavated 300mm in TPZ.	P	4	2B	S
84	<i>E. signata</i> (Scribbly Gum)	20	510	640	6.1	2.7	G	G	8 2 6 4	M	dw, tropism to the north.	P	4	2B	S
85	<i>A. costata</i> (Smooth-barked Apple)	16	260	330	3.1	2.1	G	G	3 1 1 2	YM	dw, K@8m (minor).	P	4	2B	S
86	<i>E. signata</i> (Scribbly Gum)	22	410	480	4.9	2.4	G	G	6 2 4 6	M	dw, IFU@6m, vertical leaders.	P	4	2B	S
87	<i>E. signata</i> (Scribbly Gum)	10	210	300	2.5	2.0	G	G	2 1 2 2	J	dw, E.	P	3	2B	S
88	<i>Allocasuarina littoralis</i> (Black She-Oak)	6	140	200	2.0	1.7	P	F	1.5 radial	YM	Decl, crown dead, bark lifting.	P	3	3B	S
89	<i>E. signata</i> (Scribbly Gum)	16	310	400	3.7	2.3	G	G	4 radial	YM	FA, dw.	P	4	2B	S
90	<i>E. signata</i> (Scribbly Gum)	16	260	360	3.1	2.1	G	G	6 radial	M	dw.	P	4	2B	S
91	<i>E. signata</i> (Scribbly Gum)	22	380	460	4.6	2.4	F	G	4 2 3 4	M	1.2m to building, paved and concreted, dw, E, PFS, burl, crown over building.	P	5	3B	S
92	<i>C. gummifera</i> (Red Bloodwood)	15	210	230	2.5	1.8	F	F	2 1 2 1	YM	dw, E, TW@2m, K (minor).	P	4	2B	S
93	<i>A. littoralis</i> (Black She-Oak)	6	120	180	2.0	1.6	G	G	2 radial	M	Male tree.	P	4	2B	S
94	<i>E. signata</i> (Scribbly Gum)	10	180	240	2.2	1.8	G	F	3 - 1 3	YM	Basal TW (minor), dw.	P	3	2B	S
95	<i>E. signata</i> (Scribbly Gum)	10	120	210	2.0	1.7	G	G	2 - 1 2	J	dw.	P	3	2B	S

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruited body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec.-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) **Hazard Rating-3**=low hazard, **12**=dangerous, **N/A**-not applicable, **SULE**-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
96	<i>A. costata</i> (Smooth-barked Apple)	10	120	200	2.0	1.7	G	F	1 radial	YM	FA.	P	4	2B	S
97	<i>E. signata</i> (Scribbly Gum)	18	340	510	4.1	2.5	G	G	6 8 6 4	M	On 600mm cut to north, old bark splits (minor), dw.	P	4	2B	S
98	<i>A. costata</i> (Smooth-barked Apple)	18	TD 200 210 260 (390)	450	4.7	2.4	G	G	4 4 4 5	M	On 500mm cut to north, dw.	P	4	2B	S
99	<i>C. gummifera</i> (Red Bloodwood)	18	CD 120 300 (320)	460	3.8	2.4	G	G	6 radial	M	dw.	P	4	2B	S
100	<i>C. gummifera</i> (Red Bloodwood)	16	240	300	2.9	2.0	G	F	4 - 1 4	YM	FA.	P	4	2B	S
101	<i>E. signata</i> (Scribbly Gum)	20	320	420	3.8	2.3	G	F	8 radial	M	FA, dw.	P	4	2B	S
102	<i>A. costata</i> (Smooth-barked Apple)	16	240	300	2.9	2.0	G	G	- 4 - 4	M	FA, dw.	P	3	2B	S
103	<i>A. littoralis</i> (Black She-Oak)	8	120	200	2.0	1.7	F	G	2 2 - 1	M	dw, sparse canopy.	P	3	3B	S
104	<i>C. gummifera</i> (Red Bloodwood)	12	180	190	2.2	1.7	G	G	2 radial	YM	dw.	P	3	2B	S
105	<i>A. costata</i> (Smooth-barked Apple)	14	CD 160 180 (240)	300	2.9	2.0	G	G	3 1 - 1	YM	dw.	P	3	2B	S
106	<i>S. sebiferum</i> (Chinese Tallow)	6	120	180	2.0	1.6	G	G	2 radial	YM		P	3	2B	S

**ABBREVIATIONS:** m-metres, mm-millimetres, DBH-trunk diameter @ 1.4m, DGL-trunk diameter at ground level, VP-very poor, P-poor, F-fair, G-good, VG-very good, CD-co-dominant trunk, TD-tri-dominant trunk, QD-4x trunk, TL-trunk lean, TW-trunk wound, Insp-inspect, L-longicorns, E-epicormics, K-Kino, FA-forest architecture, FR-Forest Remnant, dw-deadwood small, DW-deadwood large, TDB-tip dieback, PFS-previous failure site, RFS-recent failure site, BEW-branch end weight, MTU-multi tree union, MFU-main fork union, IFU-inclusive fork union, IMFU-inclusive main fork union, IMBU-inclusive main branch union, MBA-Multiple branch attachments, FB-fruiting body, BF-bracket fungus, U/C-under canopy, Decl-declining, B-borers, PD-parrot damage, LD-leaf damage, CMP-chewing mouth piece, RW-reaction wood, H/D-Height/Diameter ratio test [Mattheck, Breloer (1994)], J-juvenile, YM-young mature, SM-semi mature, M-mature, OM-over mature, HFP-high failure potential, D-dangerous, VD-very dangerous, X-no room to grow/unsuitable, H-habitat, HB-habitat box, Rec.-recommendation, S-save, R-remove, T-transplant, C-council determination, W-work needed to be carried out, mon-monitor, TPO-tree preservation order, HV-high voltage, PL-power lines, VTA (P-pass, F-fail) **Hazard Rating-3**=low hazard, **12**=dangerous, **N/A**-not applicable, **SULE**-Safe & Useful Life Expectancy.

Tree No.	Type	Height (m)	DBH (mm)	DGL (mm)	Radius of full TPZ (m)	Radius of full SRZ (m)	Health Vigour	Structural Condition	Canopy Spread (m) N S E W	Age Class	Comments	VTA	Hazard Rating 3-12	SULE	Rec
107	<i>S. sebiferum</i> (Chinese Tallow)	6	130	180	2.0	1.6	G	G	2 radial	YM	Group of 6 in bed - all smaller. In building footprint.	P	3	2B	R
108	<i>E. globoidea</i> (White Stringybark)	16	210	300	2.5	2.0	G	G	2 radial	YM	dw, E. In building footprint.	P	4	2B	R
109	<i>E. globoidea</i> (White Stringybark)	18	340	440	4.1	2.3	F	G	6 6 8 2	M	dw, E, witches brooms. In building footprint.	P	4	2B	R
110	<i>E. globoidea</i> (White Stringybark)	18	220	380	2.6	2.2	F	G	4 2 6 4	M	Witches brooms. In building footprint.	P	4	2B	R
111	<i>Angophora subvelutina</i> (Broad-leaved Apple)	24	510	720	6.1	2.9	G	G	8 radial	M	dw, K@3m (minor). In building footprint.	P	4	1A	R
112	<i>E. globoidea</i> (White Stringybark)	16	210	300	2.5	2.0	G	G	2 radial	YM	dw, E, witches brooms. In building footprint.	P	4	2B	R
113	<i>Elaeocarpus reticulatus</i> (Blueberry Ash)	6	100	140	2.0	1.5	G	G	1 radial	YM	<2m to building. In building footprint.	P	3	2B	R
114	<i>Lophostemon confertus</i> (Brushbox)	5	120	180	2.0	1.6	G	G	1 radial	YM	<500mm to building. In building footprint.	P	3	3B	R
115	<i>S. sebiferum</i> (Chinese Tallow)	6	180	220	2.2	1.8	G	P	1.5 radial	YM	<500mm to building, good large surface root under building and 1 root cut.	F	5	4AC	R

## Appendix 4: Notes on Tree Assessment

Key	Criteria	Comments
<b>Tree No</b>	Must relate to the number on your site diagram	
<b>Species</b>	Botanical name and common name of Tree	
<b>Diameter of trunk</b>	DBH     Diameter at Breast Height (1.4 metres) DGL     Diameter at Ground Level	
<b>Height</b>	In metres	
<b>Spread</b>	Average diameter of canopy in metres	
<b>Crown Condition</b>	Overall vigour and vitality 0        Dead 1        Severe decline (<20% canopy; major dead wood) 2        Declining (20-60% canopy density; twig and branch dieback) 3        Average/low vigour (60-90% canopy density; twig dieback) 4        Good (90-100% crown cover; little or no dieback or other problems) 5        Excellent (100% crown cover, no deadwood or other problems)	This requires knowledge of species.
<b>Age class</b>	Y        Young = recently planted S        Semi-mature (< 20% of life expectancy) M        Mature (20-80% of life expectancy) O        Over-mature (> 80% of life expectancy)	
<b>Special Significance</b>	A        Aboriginal C        Commemorative Ha      Habitat Hi      Historic M       Memorial R       Rare U       Unique form O       Other	This may require specialist knowledge.
<b>Services/adjacent structures</b>	Bs      Bus stop Bu      Building within 3m HVo    High voltage open-wire construction HVb    High Voltage bundled (ABC) LVo    Low Voltage open-wire construction LVb    Low Voltage bundled (ABC) Na      No services above Nb      No services below ground Si      Signage Sl      Street light T       Transmission lines (>33KV) U       Underground services O       Other	More than one of these may apply.
<b>Defects</b>	B       Borers C       Cavity D       Decay dw      Deadwood E       Epicormics FA      Forest Architecture H/D     Height/Diameter ratio I       Inclusions L       Lopped LDCMP Leaf damage by chewing mouthpieced insects	More than one of these may apply.  H/D if ratio is higher than 50:1 then tree is defective (Mattheck, Breloer 1994).

Key	Criteria	Comments
	M Mistletoe/Parasites MBA Multiple Branch Attachments PD Parrot Damage PFS Previous Failure Sites S Splits/cracks T Termites TL Trunk Lean TW Trunk Wound O Other	
<b>Root zone</b>	C Compaction D Damaged/wounded roots (eg by mowers) E Exposed roots Ga Tree in garden bed Gi Girdled roots Gr Grass Kb Kerb close to tree L+ Raised soil level L- Lowered soil level M Mulched Pa Paving/concrete/bitumen Pr Roots pruned O Other	More than one of these may apply.
<b>Failure Potential</b>	Identifies the most likely failure and rates the likelihood that the structural defect(s) will result in failure within the inspection period.  1. Low – defects are minor (eg dieback of twigs, small wounds with good wound wood development) 2. Medium – defects are present and obvious (eg cavity encompassing 10-25% of the circumference of the trunk) 3. High – numerous and or significant defects present (eg cavity encompassing 30-50% of the circumference of the trunk, major bark inclusions) 4. Severe – defects are very severe (eg heart rot fruiting bodies, cavity encompassing more than 50% of the trunk)	This requires specialist knowledge
<b>Size of defective part</b>	Rates the size of the part most likely to fail. The larger the part that fails, the greater the potential for damage. 1. most likely failure less than 150mm in diameter 2. Most likely failure 150-450mm in diameter 3. Most likely failure 450-750mm in diameter 4. Most likely failure more than 750mm in diameter	
<b>Target Rating*</b>	Rates the use and occupancy of the area that would be struck by the defective part 1. Occasional use (e.g. jogging/cycle track) 2. Intermittent use (e.g. picnic area, day use parking) 3. Frequent use, secondary structure (e.g. seasonal camping area, storage facilities) 4. Constant use, structures (e.g. year-round use for a number of hours each day, residences)	
<b>Hazard rating*</b>	Failure potential + size of part + target rating Add each of the above sections for a number out of 12	The final number identifies the degree of risk. The next step is to determine a management strategy. A rating in this column does not condemn a tree but may indicate the need for more investigation and a risk management strategy.

## **Appendix 5: Rating System for Tree Significance**

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating tree significance becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site.

Once landscape significance of an individual tree has been defined, the retention value can then be determined. (Table 1.0 in this Appendix). The terms used in the Assessment Criteria and Tree Retention Value - Priority Matrix, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

### **TREE SIGNIFICANCE - ASSESSMENT CRITERIA**

#### **1. High Significance in landscape**

- The tree is in good condition, or normal vigour and form typical of the species,
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of grand age.
- The tree is listed as a Heritage Item, Threatened Species or part of a Threatened Community or listed on council's significant tree register.
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape by bulk and scale and makes a positive contribution to the local amenity.
- The tree has been influenced by historic figures, events or part of the heritage development of the place.
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.
- The growing environment supports the tree to its full dimensions above and below ground without conflict or constraint.

#### **2. Medium Significance in landscape**

- The tree is in fair-good condition, or normal or low vigour and form typical or atypical of the species.
- The tree is a planted locally indigenous or a common species with its taxa readily planted in the local area.
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street.
- The tree provides a fair contribution to the visual character and amenity of the area.
- The tree is moderately constrained by above or below ground influences of the built environment to reach full dimensions.

#### **3. Low Significance in landscape**

- The tree is in fair-poor condition, or normal or low vigour and form typical or atypical of the species,
- The tree is not visible or is partly from surrounding properties as obstructed by other vegetation or buildings.
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the area.
- The tree is severely constrained by above or below ground by influences of the built environment and therefore will not reach full dimensions; tree is inappropriate to the site conditions.
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order.
- The tree has a wound or defect that has potential to become structurally unsound.

#### **4. Environmental Pest/Noxious Weed Species**

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties.
- The tree is a declared noxious weed by legislation.

#### **5. Hazardous/Irreversible Decline**

- The tree is structurally unsound and/or unstable and is considered potentially dangerous.
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

**The tree is to correspond with at least three (3) of the criteria in categories 1, 2 and 3, and one (1) criteria only is required in categories 4 and 5 to be classified in that group.**

Note: The assessment criteria are for individual trees only and are not to be applied to stands of trees.

**TABLE 1.0 TREE RETENTION VALUE - PRIORITY MATRIX.**

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
Legend for Matrix Assessment						
		<b>Priority for Retention (High)</b> - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as detailed in Table 2. Special construction works must be implemented e.g. pier and beam, etc, if works are to proceed within the Tree Protection Zone.				
		<b>Consider for Retention (Medium)</b> - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.				
		<b>Consider for Removal (Low)</b> – These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.				
		<b>Priority for Removal</b> – These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.				

## **Appendix 6: Extract from AS4970-2009 Protection of trees on development sites, Section 3, Determining the tree protection zones of the selected trees,**

### **3.1 Tree protection zone (TPZ)**

#### **3.1 TREE PROTECTION ZONE (TPZ)**

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

*The TPZ incorporates the structural root zone (SRZ) (refer to Clause 3.3.5).”*

#### **3.2 DETERMINING THE TPZ**

##### TPZ for Single Trunked Trees

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

$$\text{TPZ} = \text{DBH} \times 12$$

##### TPZ for Multiple Trunked Trees

The radius of the TPZ for multiple trunked trees is calculated using the following formula:

-----

$$\sqrt{(\text{DBH}_1)^2 + (\text{DBH}_2)^2 + (\text{DBH}_3)^2} = \text{total DBH} \times 12$$

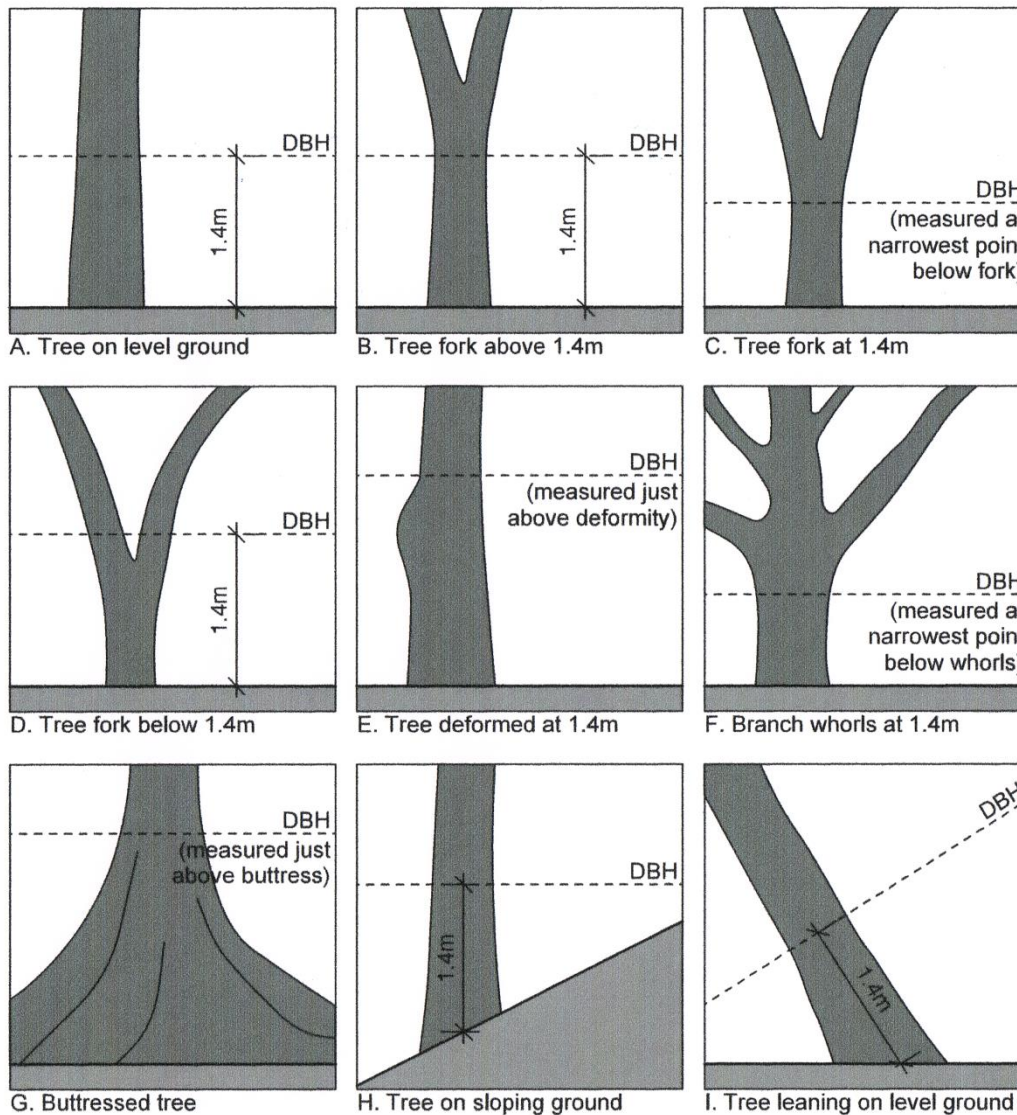
DBH = trunk diameter measured at 1.4 metres above ground.

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

A TPZ should not be less than 2 metres nor greater than 15 metres (except where crown protection is required).

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





**DBH = Diameter at Breast Height**  
DBH is measured 1.4m above ground level.

**Note:**  
For multi-stemmed trees (eg. figure D), the DBH may be calculated using the formula:

$$Total\ DBH = \sqrt{(DBH_1)^2 + (DBH_2)^2 + (DBH_3)^2}$$

Appendix 7: Extract from AS4970-2009 Protection of trees on development sites, Section 3, Determining the protection zones of the selected trees, 3.3.5 Structural root zone (SRZ)

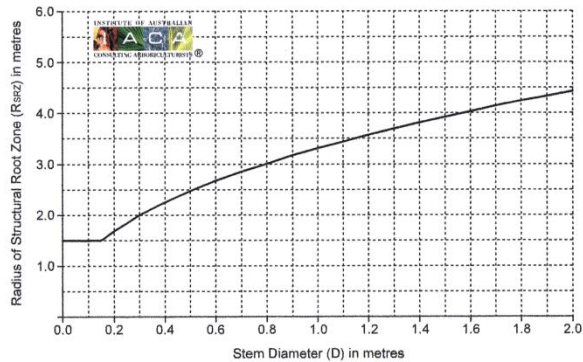
3.3.5 Structural root zone (SRZ)

"The SRZ is the area required for street stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when a major encroachment into a TPZ is proposed. Root investigation may provide more information on the extent of these roots."

Determining the SRZ

Note: The SRZ for trees with trunk diameters less than 0.15 m will be 1.5 m.  
(see Figure 01 and 02) and Table 2.0.

Based on IACA Members licence of AS4970-2009



SRZ = Structural Root Zone  
Referred to as radius in metres.

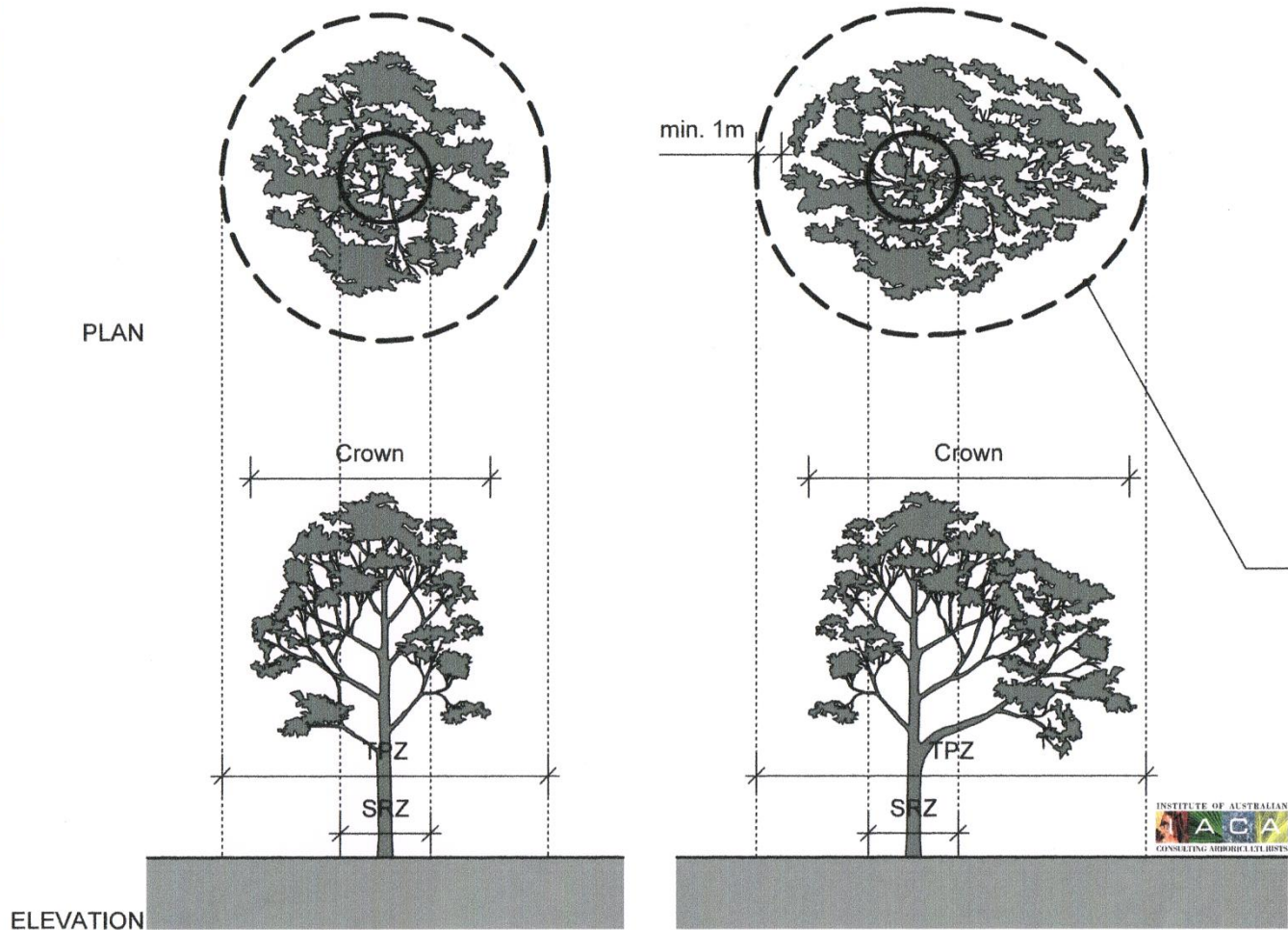
Note:  
a) The SRZ curve can be calculated using the formula:

$$R_{SRZ} = (D \times 50)^{0.42} \times 0.64$$

where:  
R<sub>SRZ</sub> = Radius of Structural Root Zone  
D = Stem Diameter (measured directly above root buttress in metres)

b) SRZ of trees <0.15m diameter is 1.5m.

c) SRZ formula and curve do not apply to trees with an asymmetrical root plate, palms, cycads or tree ferns.



**TPZ = Tree Protection Zone**  
Referred to as radius in metres and calculated using the formula:

$$TPZ = 12 \times DBH$$

where:

**DBH** = Diameter at Breast Height  
(measured 1.4 m above ground level)

**SRZ = Structural Root Zone**  
Referred to as radius in metres and calculated using the formula:

$$R_{SRZ} = (D \times 50)^{0.42} \times 0.64$$

where:

**R<sub>SRZ</sub>** = Radius of Structural Root Zone  
**D** = Stem Diameter (measured directly above root buttress in metres)

**TABLE 2.0 TPZ AND SRZ TABLE**

DBH for TPZ (mm)	DGL for SRZ (mm)	TPZ (m)	SRZ (m)	DBH for TPZ (mm)	DGL for SRZ (mm)	TPZ (m)	SRZ (m)	DBH for TPZ (mm)	DGL for SRZ (mm)	TPZ (m)	SRZ (m)
100	100	2.0	1.5	500	500	6.0	2.5	900	900	10.8	3.2
110	110	2.0	1.5	510	510	6.1	2.5	910	910	10.9	3.2
120	120	2.0	1.5	520	520	6.2	2.5	920	920	11.0	3.2
130	130	2.0	1.5	530	530	6.4	2.5	930	930	11.2	3.2
140	140	2.0	1.5	540	540	6.5	2.6	940	940	11.3	3.2
150	150	2.0	1.5	550	550	6.6	2.6	950	950	11.4	3.2
160	160	2.0	1.5	560	560	6.7	2.6	960	960	11.5	3.3
170	170	2.0	1.6	570	570	6.8	2.6	970	970	11.6	3.3
180	180	2.2	1.6	580	580	7.0	2.6	980	980	11.8	3.3
190	190	2.3	1.7	590	590	7.1	2.7	990	990	11.9	3.3
200	200	2.4	1.7	600	600	7.2	2.7	1000	1000	12.0	3.3
210	210	2.5	1.7	610	610	7.3	2.7	1010	1010	12.1	3.3
220	220	2.6	1.8	620	620	7.4	2.7	1020	1020	12.2	3.3
230	230	2.8	1.8	630	630	7.6	2.7	1030	1030	12.4	3.4
240	240	2.9	1.8	640	640	7.7	2.7	1040	1040	12.5	3.4
250	250	3.0	1.9	650	650	7.8	2.8	1050	1050	12.6	3.4
260	260	3.1	1.9	660	660	7.9	2.8	1060	1060	12.7	3.4
270	270	3.2	1.9	670	670	8.0	2.8	1070	1070	12.8	3.4
280	280	3.4	1.9	680	680	8.2	2.8	1080	1080	13.0	3.4
290	290	3.5	2.0	690	690	8.3	2.8	1090	1090	13.1	3.4
300	300	3.6	2.0	700	700	8.4	2.9	1100	1100	13.2	3.4
310	310	3.7	2.0	710	710	8.5	2.9	1110	1110	13.3	3.5
320	320	3.8	2.1	720	720	8.6	2.9	1120	1120	13.4	3.5
330	330	4.0	2.1	730	730	8.8	2.9	1130	1130	13.6	3.5
340	340	4.1	2.1	740	740	8.9	2.9	1140	1140	13.7	3.5
350	350	4.2	2.1	750	750	9.0	2.9	1150	1150	13.8	3.5
360	360	4.3	2.1	760	760	9.1	3.0	1160	1160	13.9	3.5
370	370	4.4	2.2	770	770	9.2	3.0	1170	1170	14.0	3.5
380	380	4.6	2.2	780	780	9.4	3.0	1180	1180	14.2	3.6
390	390	4.7	2.2	790	790	9.5	3.0	1190	1190	14.3	3.6
400	400	4.8	2.3	800	800	9.6	3.0	1200	1200	14.4	3.6
410	410	4.9	2.3	810	810	9.7	3.0	1210	1210	14.5	3.6
420	420	5.0	2.3	820	820	9.8	3.0	1220	1220	14.6	3.6
430	430	5.2	2.3	830	830	10.0	3.1	1230	1230	14.8	3.6
440	440	5.3	2.3	840	840	10.1	3.1	1240	1240	14.9	3.6
450	450	5.4	2.4	850	850	10.2	3.1	1250	1250	15.0	3.6
460	460	5.5	2.4	860	860	10.3	3.1				
470	470	5.6	2.4	870	870	10.4	3.1				
480	480	5.8	2.4	880	880	10.6	3.1				
490	490	5.9	2.5	890	890	10.7	3.2				



## Appendix 8: Tree Protection Zones – Standard Procedure

### 1.0 TREE PROTECTION ZONES - STANDARD PROCEDURE

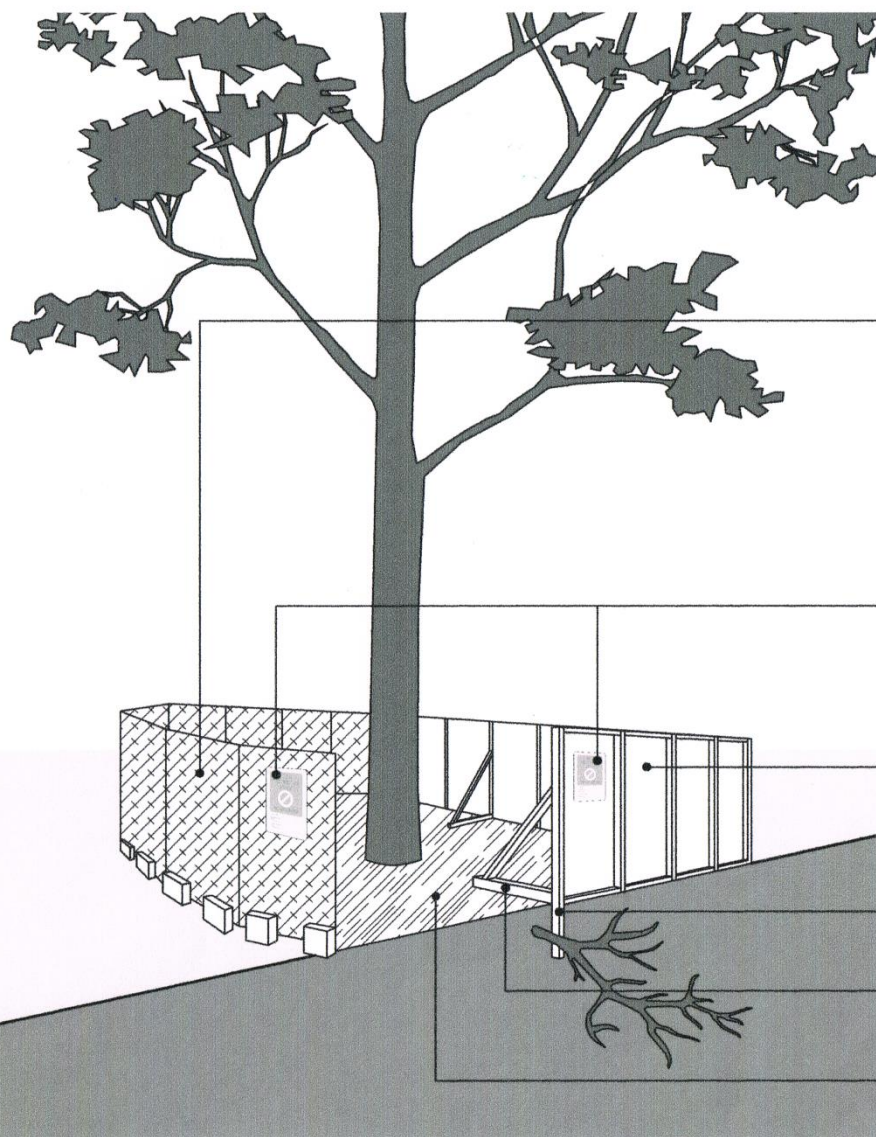
- 1.1 The Protective fencing where required may delineate the **TPZ** and should be located as determined by the project Arborist either in accordance with the specific Council's guidelines or if no guidelines given by the Council then using AS4970 *Protection of trees on development sites*, Section 4, 4.3. *"Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ must be secured to restrict access. AS4687 Temporary fencing and hoardings specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area. Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of the protective fencing."*

Figure 03 Protective fencing shows examples of such fencing.

- 1.2 AS4970 Section 4, Tree protection measures, 4.2 Activities restricted within the TPZ

*"Activities generally excluded from the TPZ included but are not limited to-*

- (a) Machine excavation including trenching;*
- (b) Excavation for silt fencing*
- (c) Cultivation;*
- (d) Storage;*
- (e) Preparation of chemicals, including preparation of cement products;*
- (f) Parking of vehicles and plant;*
- (g) Refuelling;*
- (h) Dumping of waste;*
- (i) Wash down and cleaning of equipment;*
- (j) Placement of fill;*
- (k) Lighting of fires;*
- (l) Soil level changes;*
- (m) Temporary or permanent installation of utilities and signs, and*
- (n) Physical damage to the tree."*



**Note:**

No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

**Option 1 - Fencing**

1.8m high chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet.

Tree Protection Zone (TPZ) sign

**Option 2 - Fencing**

Plywood or wooden panel paling fence. This type of fencing material also prevents building materials or soil entering the TPZ.

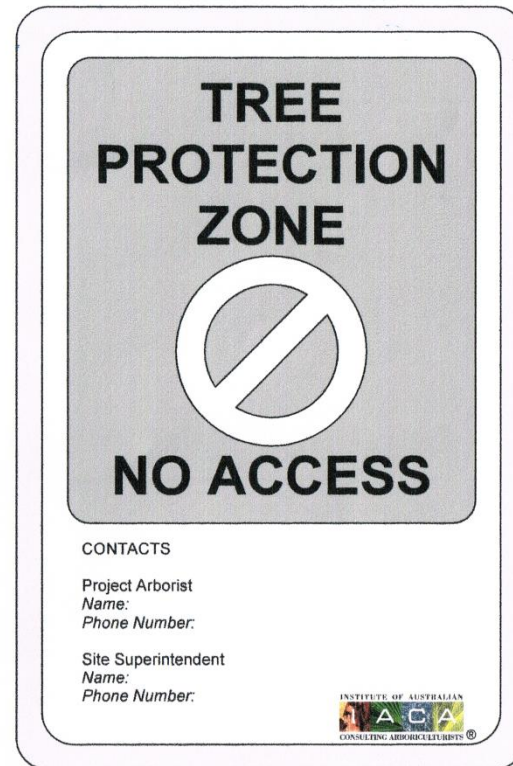
Installation of supports should avoid damaging roots.

Bracing is permissible within the TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer installed across surface of TPZ.

- 1.3 Tree Protection signage is to be attached to each **Tree Protection Zone** and displayed from within the development site in accordance with AS4970-2009 *Protection of trees on development sites*, Section 4.4 and example Figure 08.

Based on IACA Members licence of AS4970-2009



08

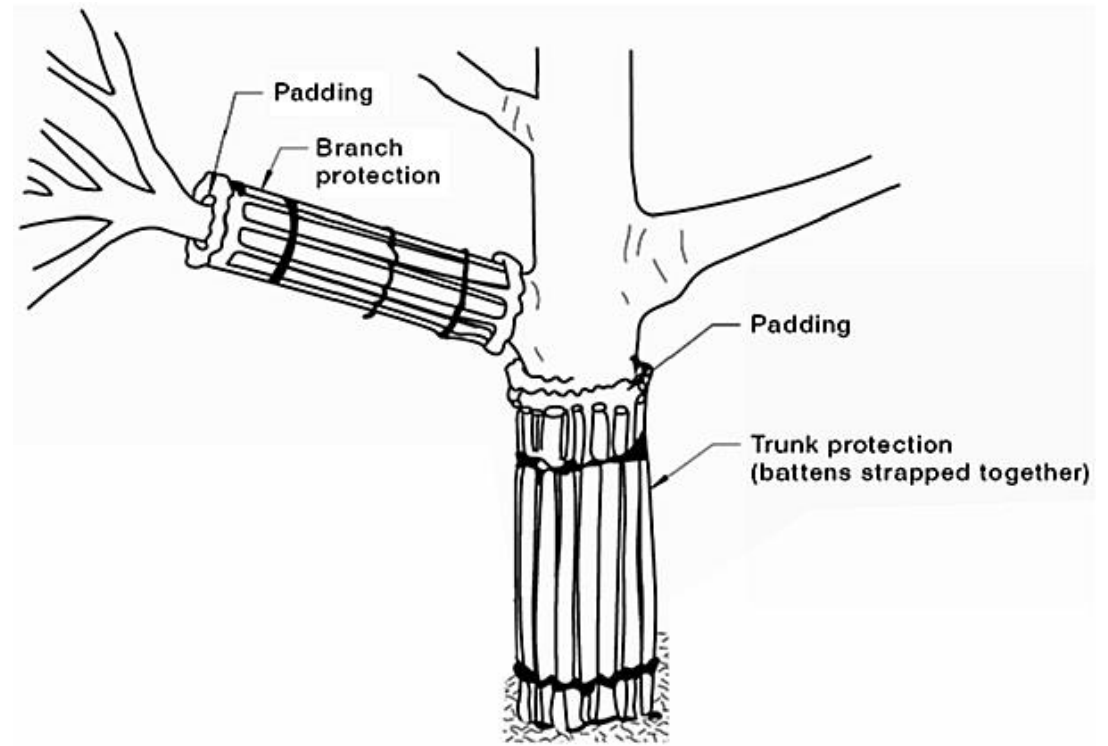
Example of Tree Protection Zone (TPZ) Signage

Scale 1:5 @ A4

Copyright © 2010 IACA

- 1.4 Where a tree is to be retained and a **Tree Protection Zone** cannot be adequately established due to restricted access e.g. tree located along side an access way, the trunk and branches in the lower crown will be protected by wrapping 2 layers of hessian or carpet underfelt around the trunk and branches for a minimum of 2 m or as lower branches permit, then wire or rope secures 75x50x2000 mm hardwood battens together around the trunk (do not nail or screw to the trunk or branches). The number of battens to be used is as required to encircle the trunk and the planks are to extend to the base of the tree (AS4970-2009 *Protection of trees on development sites*, Figure 4 Examples of Trunk, Branch and ground protection below).

- 1.5 If a tree is growing down slope from an excavation, a silt fence located along the contours of the site in the area immediately above the **Tree Protection Zone** fencing may need to be installed and regularly maintained to prevent burial and asphyxiation of the roots of the tree. To allow for the maintenance of both fences, the silt fence must be constructed separately to the tree protection fence and the 2 fences must be constructed independently of each other and standalone. To reduce competition with the tree the area within the **Tree Protection Zone** is to be kept free of weeds. These are best removed by the application of foliar herbicide with Glyphosate as the active constituent. This is the preferred method rather than removal by cultivation of the soil within the dripline, to minimise root disturbance to the tree. The removal of woody weeds such as Privet should use the cut and paint method of herbicide application. Weeds are to be controlled within the **Tree Protection Zone**, for the duration of the project.





- 1.6 The area of the Tree Protection Zone to be mulched to a depth of 50mm with organic material being 75% leaf litter and 25% wood, and this being composted material. The depth of mulch and type as indicated, to be maintained for the duration of the project. Where deep excavation will expose the soil profile to drying out the root plate is to be protected by pegging jute matting across the ground surface 2 m back from the edge of the profile and 2 m down the face of the profile and is to be in one continuous sheet or layers up to 5 mm thick and overlapped 300 mm and pegged. Pegs are to be a minimum length of 200 mm and spaced at 500 mm increments in a grid pattern. Once installed mulch is to be placed on top of the jute matting previously described.
- 1.7 No services either temporary or permanent are to be located within the **Tree Protection Zone**. If services are to be located within the **Tree Protection Zone**, special details will need to be provided by a qualified Consulting Arboriculturist for the protection of the tree regarding the location of the service/s. Works within the TPZ should be hand dug or tunnelled.
- 1.8 A tree will not be fertilised during its protection within the **Tree Protection Zone**, as this may hasten its decline if it were to decline. If a tree is to be fertilised this should be in consultation with a qualified Consulting Arboriculturist.
- 1.9 In the event of prolonged dry periods, or where a tree has been transplanted, or where excavation nearby, especially up slope, leads to drying out of a soil profile, or modification to ground water flow, or flows across an existing ground surface to the tree and its growing environment; deep root watering thoroughly at least twice a week is to be undertaken to irrigate the tree. The need for such watering is determined readily by observing the dryness of the soil surface within the dripline of the tree by scraping back some mulch. Mulch is to be reinstated afterwards. In the event of disrupted ground or surface water flows to the tree due to excavation, filling or construction, a reticulated irrigation system may be required to be installed within the **Tree Protection Zone**. If an irrigation system is to be installed, consideration must be given to volume, frequency, and drainage of water delivered, and this should be in consultation with a qualified Consulting Arboriculturist.

## **Appendix 9: Tree Protection on Construction Sites**

### **1.0 TREE PROTECTION ON CONSTRUCTION SITES**

Note: Individual protection measures to be applied where stated as applicable.

#### 1.1.0 General notes

#### 1.2.0 Cautionary notes for the protection of retained trees

#### 1.3.0 Demolition of built structures - precautions to protect trees

#### 1.4.0 Excavation and construction close to Tree Protection Zones

#### **1.1.0 General notes**

1.1.1 The application of any measures for the protection of trees on development sites is determined by the species characteristics of the subject tree, and the existing physical constraints of the growing environment on site both above and below ground.

1.1.2 This report considers where applicable, Australian Standard AS4970-2009 *Protection of trees on development sites*.

1.1.3 This report applies the **Tree Protection Zone - Standard Procedure** However, this does not restrict the author from applying additional or alternative conditions where it is deemed appropriate by the author for the protection of trees on development sites. Such additional or alternative conditions may be founded upon professional judgement based on:

- the experience of the Consulting Arboriculturist
- scientific research
- new technology
- industry best practice
- consideration of the individual tree species and its relative tolerance to development impacts
- the individual or cumulative factors present or proposed to impact upon the growing environment essential for the trees' survival

1.1.4 Where this report makes reference to the retention of subject trees it is for their incorporation into the landscaping works for the site, and they are to be documented on a Landscape Plan for the site.

#### **1.2.0 Cautionary notes for the protection of retained trees**

### 1.2.1 Installing underground services within TPZ

If an underground utility service is to be located within the area of the TPZ Australian Standard AS4970-2009 *Protection of trees on development sites*, Section 4, 4.5.5 Installing underground services within TPZ provides the following:

*“All services should be routed outside the TPZ. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches.*

*The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees.*

*For manual excavation trenches the project Arborist should advise on roots to be retained and should monitor the works. Manual excavation may include the use of pneumatic and hydraulic tools. Refer Clause 4.5.3.”*

#### 1.2.1.1 Location of services Option B (Driveway Construction)

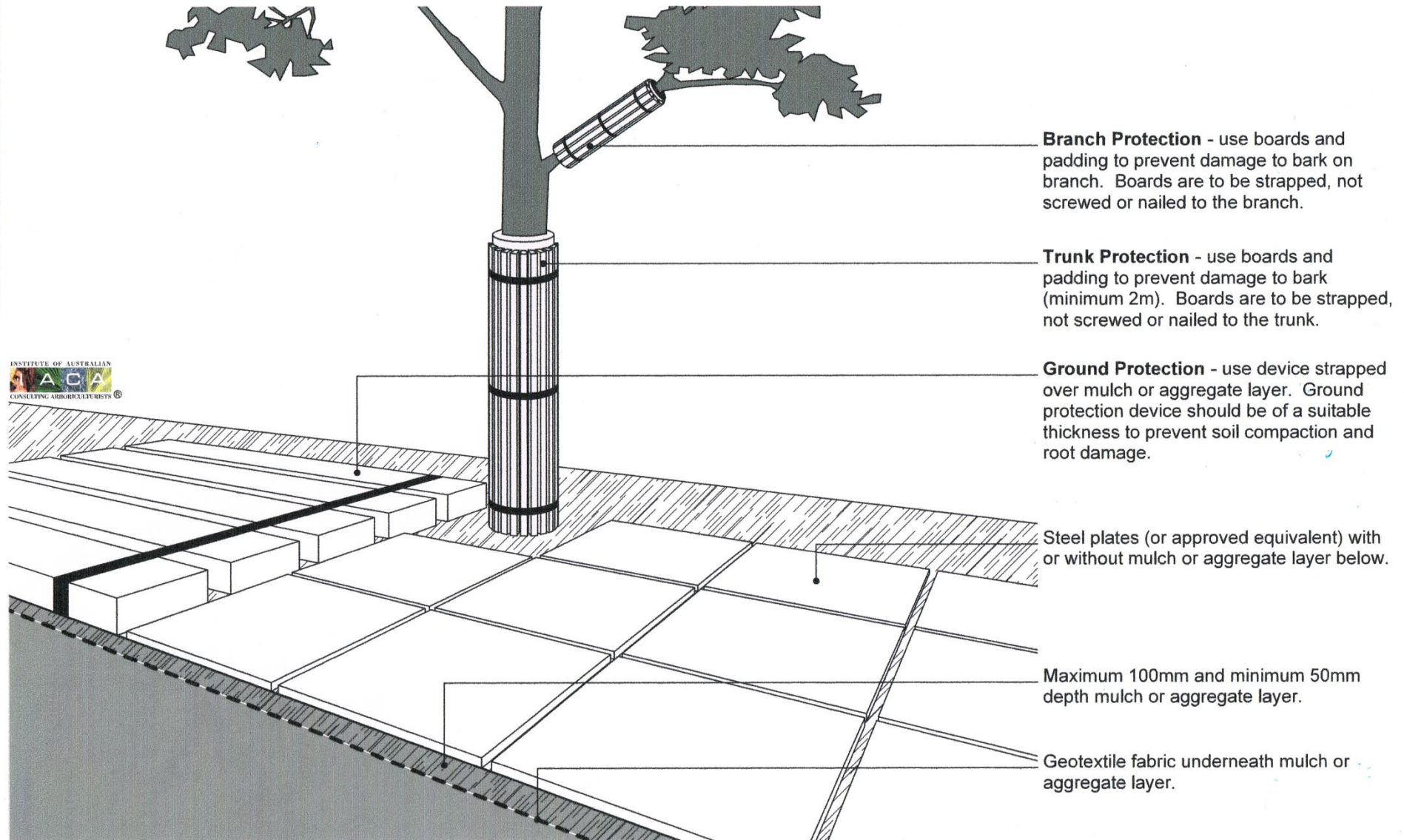
If a service is to be located within the area of the dripline of a protected tree or within the Tree Protection Zone, and site conditions such as shallow bed rock or if mass rooting has occurred from multiple trees growing in close proximity to each other, the service trench is to be elevated and positioned above natural ground level within the new driveway structure. The existing driveway surface is to be scabbled and a reinforced concrete topping is to be provided with down turned thickened edges constructed under the kerb edging to prevent lateral movement. A suitable sub grade material to manufacturers’ recommendations is to be utilised if and where appropriate. Construction is to occur in a manner so as not to cause damage to the subject trees root system. All works to be in accordance with engineers’ details.

### 1.2.2 Precautions in Respect of Temporary Work

For Precautions in respect of temporary work, Australian Standard AS4970-2009 *Protection of trees on development sites*, Section 4, Tree protection measures, 4.5 Other tree protection measures, provides the following:

#### ***“4.5.3 Ground protection***

*If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards as per Figure 4. These measures may be applied to root zones beyond the TPZ.”*

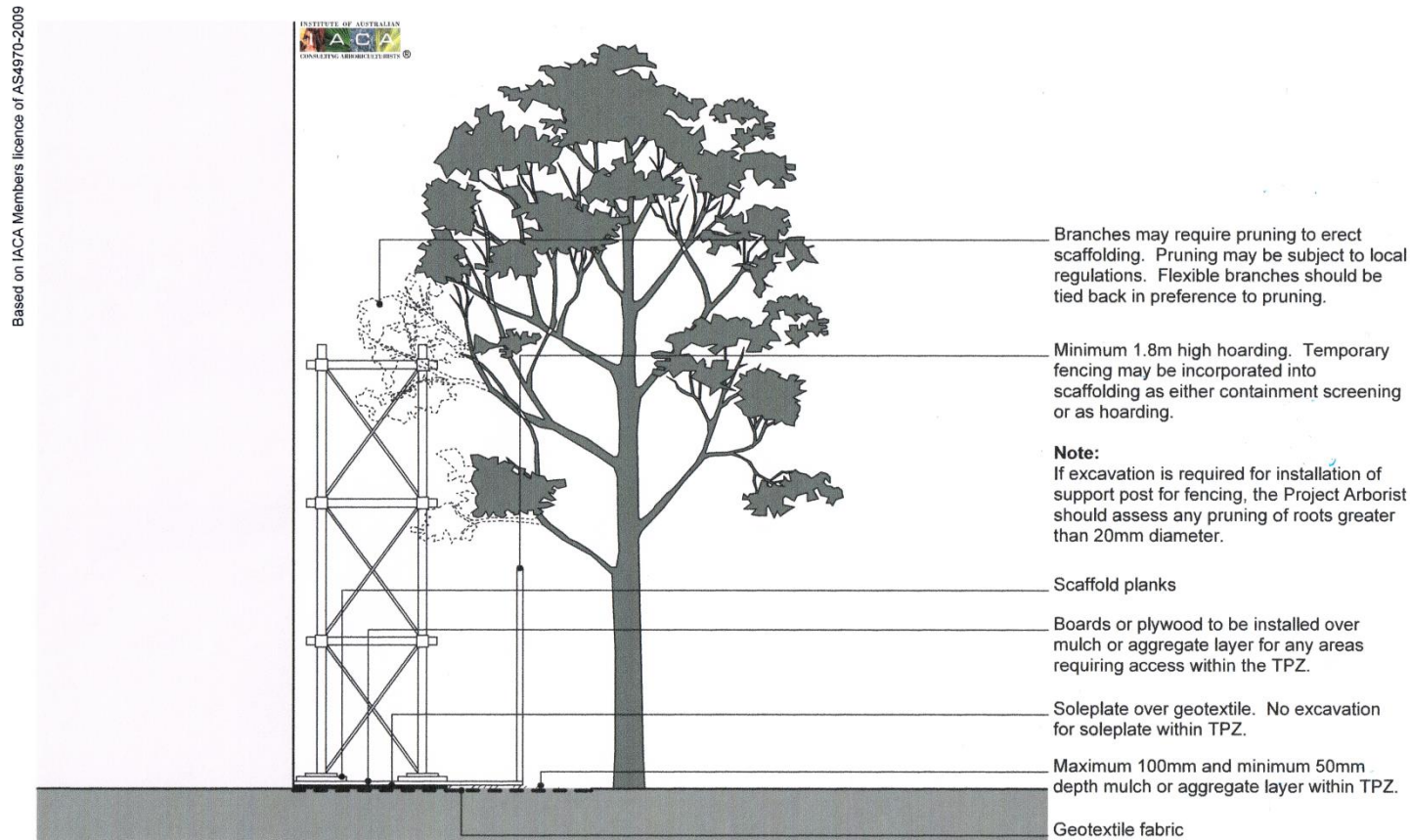


#### "4.5.6 Scaffolding

Where scaffolding is required it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimized. This can be achieved by designing scaffolding to avoid branches or tying back branches. Ground below the scaffolding should be protected by boarding (e.g. scaffolding board or plywood sheeting) as shown in Figure 5. Where access is required, a board walk or other surface material should be installed to minimise soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed."

"Notes:

- 1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
- 2 Rumble boards should be a suitable thickness to prevent soil compaction and root damage."



05

Indicative Scaffolding within a Tree Protection Zone (TPZ)

Not to Scale

Copyright © 2010 IACA

### 1.3.0 **Demolition of Built Structures - Precautions to Protect Trees**

#### 1.3.1 **Demolition of Existing Buildings**

The demolition of the buildings should be undertaken with access restricted to the driveway and the building platform for each of the existing buildings, or to areas of the land where no trees are growing within 6m of any tree to be retained. Where access or space for a safe working environment is restricted, or where the area of the 6m set back must be compromised, a 100 mm layer of Eucalyptus wood mulch must be laid over the area of encroachment. Where vehicular access is required across the mulch layer further root protection should be provided by laying a temporary pathway over the mulch. The temporary pathway should be constructed of a grated steel material capable of supporting the vehicles used during demolition e.g. similar to ramps used to load vehicles onto the backs of trucks. Trunks of trees are to be protected from vehicular damage as per section 1.2.2 above.

#### 1.3.2 **Demolition of Landscape Structures**

The demolition of walls, driveways retaining walls, paths and pools etc. within 6 m of a tree to be retained should be undertaken manually using hand tools. Where a driveway is to be demolished being of concrete strip or slab type construction, it should be undertaken by working from the end of the driveway closest to the building back towards the street by utilising the driveway as a stable platform to prevent soil compaction. Where a concrete slab driveway passes less than 1 m from the base of a tree and the area beneath the driveway is to be undisturbed and incorporated into the landscape works for the site, the volume of space previously occupied by the driveway must be replaced with local top soil from the site or otherwise a loamy sand, to replace the mass of the concrete on the root plate which may be critical to the ballast and centre of mass for the stability of the tree. If the tree becomes unstable immediately contact the Consultant Arboriculturist.

#### 1.3.3 **Removal of Existing Trees near Trees to be Retained**

Removal of a tree within 6 m of a tree to be retained should be undertaken only by cutting down such a tree without damaging the trees to be retained, and by grinding out its stump. Where possible the structural roots of 20 mm diameter or greater of the tree to be cut down should not be removed, to minimise soil disturbance and to reduce the impact on the roots of any tree to be retained nearby. Where structural roots are to be removed this should be undertaken manually by the use of non-motorized hand tools after the stump has been ground out when such roots are often easier to locate from the site of the stump from which they have been severed.

### 1.4.0 **Excavation and Construction close to Tree Protection Zones**

#### 1.4.0.1

Where structural woody roots with a diameter of 20 mm or greater are to be pruned outside the area of the Tree Protection Zone, they are to be excavated manually first by using hand tools to determine their location. A Waterknife or Airknife can be used as a mechanised alternative to locate such structural woody roots. Once located those roots to be severed are to be cut cleanly with a final cut to undamaged woody tissue and this will prevent tearing damage to the roots from excavation equipment which can extend beyond the point of excavation back towards the tree.

- 1.4.0.2 Where a large vigorous tree is to be retained near to a built structure, and dependent upon its taxa, age class and propensity for its roots system to regenerate, it may be prudent to install a root barrier immediately adjacent to the footing of the new building, or to deepen and strengthen the footings themselves to act as a root barrier, but for such structural advice an appropriately qualified chartered structural engineer should be consulted.

**1.4.1 Root Location and Protection where Structures are to be Positioned near a Retained Tree**

- 1.4.1.1 If walls or a driveway or other structures are to be constructed near a protected tree, careful excavation is to be undertaken manually by using non-motorized hand tools to determine the location of first order and lower order structural roots with a diameter of 20 mm (*structural woody roots*) or greater, without damaging them. Boundary walls or fences should use columns or posts within fill panels, or a wall to be constructed with suspended sections 100 mm clear above or beside any structural woody root or further as required, or any new wall to be built only to the depth of that existing. Structural woody roots to be further protected by utilising the construction techniques of pier or bridge footings, or screw piles between or over them with a minimum clearance above or beside of 100 mm, or further as required to allow for future and on-going growth.
- 1.4.1.2 Where a driveway or footpath is to pass by the tree a suspended slab is to be constructed or approved similar, to protect the roots that may be encountered at, near, or above ground, and may be constructed on gap graded fill. Where such a driveway or footpath is to be constructed the edge of the structure closest to the tree is to terminate no closer than 0.5 m from the closest edge of trunk, or further depending on the species and its likely further growth to allow for future development and expansion of the trunk, buttresses, and first order and lower order roots as may be advised by a Consultant Arboriculturist. The side of the driveway closest to a tree is to be edged with a concrete kerb of minimum dimensions of 150 x 150 mm, to prevent vehicular collision with the trunk. Here a *Waterknife* or an *Airknife* can be used as a mechanised alternative to locate first order and lower order structural woody roots.
- 1.4.1.3 Alternatively a footpath or driveway may be constructed at ground level without any excavation, removing turf by raking, having sprayed with herbicide first if time permits. Here the path or driveway section is to extend for a distance past the tree equivalent to the lateral spread of the crown of that tree alongside the footpath, or driveway.

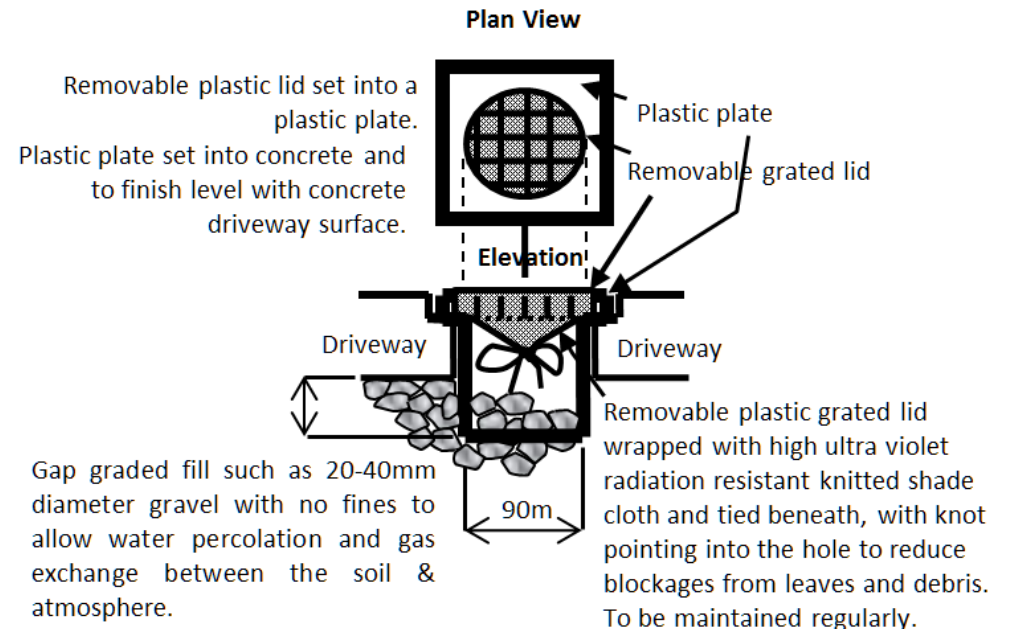


1.4.1.4 Watering / Gaseous exchange vents are to be installed in the area of the dri be concealed with the finished level beside the path equivalent to the top of the path by minimal filling with a sandy soil and turf, or mulch, or a garden bed with minimal cultivation, or other landscape treatments as appropriate.

1.4.2 **Root Protection where a Driveway close to a Tree is to be Demolished and a New Driveway Constructed in a Similar Location to a Previous Driveway.**

After demolition of an existing driveway as per 1.3.2, the level of the base for the new driveway should be located at the same existing level as that of the base of the previous driveway, and should extend for a distance past the tree equivalent to the lateral spread of the crown of that tree alongside the driveway. To prevent excavation from damaging the existing roots which may be located at, near or above the surface of the soil beneath the base of the previous driveway, the new driveway may need to be raised by constructing it on pier or bridge footings between or over them (see 1.4.2 for minimum clearances), or based on a gap graded fill and the driveway constructed with any exposed edges concealed to the top of the driveway by minimal filling with a sandy soil and turf, or mulch, or a garden bed with minimal cultivation, or other landscape treatments as appropriate. Where roots have grown to occupy the soil between the concrete strips of a concrete, stone or brick strip driveway, they and the soil may be excavated to the level of the base of the concrete strips, but where such roots have a diameter of 20 mm or greater, a Consulting Arboriculturist should be contacted prior to such works being undertaken. Where roots are to be severed, they are to be cut cleanly with a final cut to undamaged woody tissue.

**Irrigation / Gaseous Exchange Vent** Zone area



**NOTE:** Such vents can be installed in a grid pattern at 1 per 1 m<sup>2</sup> and their planning and construction utilised in consultation with an appropriate structural or civil engineer.



#### 1.4.3 **Root Protection where a Footpath is to be Constructed close to a Tree.**

- 1.4.3.1 A footpath may be constructed at ground level without any excavation, by first killing with herbicide the plants to be removed from the pathway area, and then removing that plant material by cutting the trunks of woody shrubs to ground level and by raking all other plant material to expose the top soil surface without organic matter. This will remove the need for physically disturbing the soil and the roots of the tree. The path section is to extend for a distance past each tree equivalent to the lateral spread of the crown of that tree where it extends alongside the footpath.
- 1.4.3.2 To prevent excavation from damaging the existing roots which may be located at, near, or above the surface of the soil, a gap graded fill as a fill material of a media as appropriate, to a depth of 100 mm above the soil surface, or above the top of the root of any tree to be retained, or above the soil surface may be utilised as a base treatment to construct the foot path. Any exposed edges to be concealed to the top of the edges of the footpath and tapering back to the base of the trunk of each tree by minimal filling at each trunk of no greater than 100 mm with a sandy soil and turf, or mulch, or a garden bed with minimal cultivation with ground covers, or other landscape treatments as appropriate. A Consultant Arboriculturist should be contacted prior to such works being undertaken or if any structural roots are considered appropriate to be severed being those roots of 20 mm diameter or greater.
- 1.4.4 **Structural Soil to Accommodate Load Bearing Conditions**  
A structural soil should only be considered as a new media into which the trees could be planted if the planting was into a new area where the area surrounding was to be load bearing such as a footpath, driveway or road.
- 1.4.5 **Gap Graded Fill to Accommodate Compacted Sub Grade and Root Growth**  
To further protect woody roots with a diameter of 20 mm or greater, a gap graded fill with no fines such as gravel 40 mm diameter should only be considered as a fill media above existing grade when soil levels are to be increased near existing trees and the roots can utilise the new media to develop on-going and future root growth and provide for gaseous exchange between the soil and the atmosphere.

## ***Appendix 10: Glossary***

Please refer to *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA) 2009. (Draper & Richards)

## Appendix 11: SULE

SULE (an acronym for **Safe & Useful Life Expectancy**). There are a number of SULE categories that indicate the safe useful life anticipated for each tree. Factors such as the location, age, condition and health of the tree are significant to determining this rating. Other influences such as the tree's effect on better specimens and the economics of managing the tree successfully in its location are also relevant to SULE (Barrell 1993, 1995).

### SULE Categories and Subgroups

#### 1 = Long SULE OF > 40 years

<b>A</b> Structurally sound in suitable location	<b>B</b> Suitable to retain with some remedial care	<b>C</b> Significant status – requires special care to preserve
---	--	--

#### 2 = Medium SULE of 15-40 years

<b>A</b> Lifespan limit	<b>B</b> Eventual removal for safety or nuisance	<b>C</b> Remove for adjacent trees or replanting	<b>D</b> Requires extensive remedial care
----------------------------	---	---	--

#### 3 = Short SULE of 5-15 years

<b>A</b> Lifespan limit	<b>B</b> Eventual removal for safety or nuisance	<b>C</b> Remove for adjacent trees or replanting	<b>D</b> Requires extensive remedial care
----------------------------	---	---	--

#### 4 = Remove tree within 5 years

<b>A</b> Dead, dying or disease	<b>B</b> Unstable or exposed by new clearing	<b>C</b> Structurally defective	<b>D</b> Damaged and unsafe	<b>E</b> Remove for adjacent trees or replanting	<b>F</b> Damaging existing structures	<b>G</b> Clearing will affect stability
------------------------------------	---	------------------------------------	--------------------------------	---	--	--

#### 5 = Trees suitable to transplant

<b>A</b> Less than 5m high	<b>B</b> Young trees over 5m high	<b>C</b> Height/width contained by pruning
-------------------------------	--------------------------------------	---

The SULE rating given to any tree in this report assumes that reasonable maintenance will be provided by a qualified Arboriculturist (AQF 3) using the correct and acknowledged techniques. Retained trees are to be protected from root damage. Incorrect tree work practices can significantly accelerate tree decline and increase hazard potential.

## **Appendix 12: Curriculum Vitae**

<b>U W S (Hawkesbury)</b>	Graduate Diploma in Horticulture  Diploma in Horticulture
<b>Hortus Australia</b>	Diploma of Horticulture (Arboriculture) (RTF50203-6522-6/12/2005) Qualified AQF5
<b>Ryde School of Horticulture</b>	Tree Surgery  Arboriculture Techniques
<b>Central Coast Community College</b>	Excel Module 1 and 2  Excel – Advanced
<b>Workcover</b>	OHS General Induction for Construction Work in NSW (CGI00871464SEQ1)  St Johns Ambulance First Aid Certificate

## **CONFERENCE ATTENDANCE & TRAINING**

2015	Quantified Tree Risk Assessment System A Practitioners Guide to Visual Tree Assessment
2011	Institute of Australian Consulting Arboriculturists (IACA) AS4970 Forum
2011	Ecological Consultants Association of NSW - Impacts of Invasive Species
2010	Root Barrier Field Day
2009	Matheny & Clark: Arboriculture
2007	Quantified Tree Risk Assessment System A Practitioners Guide to Visual Tree Assessment
2006	Barrell Tree A-Z 2 Day Workshop  IML Resistograph F500S Training Course
2005	Urban Tree Forum – Sydney City Council  Urban Tree Risk Management – Treelogic  DA Workshop Preparing Development Applications for Local Council –AIH  Urban Forest – The New Imperative – Parks and Leisure Australia
2004	Visual Tree Assessment Workshop – Professor Doctor Claus Mattheck
2003	Urban Trees - Our Urban Urgency – Parks and Leisure Australia
1999	Tree Hazard Assessment – Parramatta Park – NAAA
1990	Aero Advanced Climbers Seminar NSW

## BUSINESS ACHIEVEMENT

Finalist in Central Coast Advocate Community Business Awards 2005 for Specialised Business category.

## INDUSTRY BACKGROUND

*20<sup>th</sup> June '01 to present*

*Proprietor*

**Advanced Treescape Consulting**  
(formerly known as RJK Consulting)

*January '02 to January '05*

*Part Time Horticulturist*

**Acorn/Bushlands Nursery/Aquarium Centre, Erina Heights**

*1997 to present*

*Consultant*

**Horticulturist**

*1997 to present*

*Public Speaker*

**Horticulturist/Arboriculturist Topics**

*November '97 to October '01*

*Part Time Horticulturist*

**Flower Power, Glenhaven**

*January '91 to February '95*

*Proprietor*

**KAC Peninsula Firewood**

Assembled team to clear backlog of firewood

*June '90 to January '96*

*Proprietor/Climber*

**Kingdom's Arbor Care** until it's sale.

*January '86 to May '90*

*Tree Worker*

**Arbor 2000 Pro-Climb, Sydney**

*1972 – present*

*Bonsai enthusiast*

## MEMBERSHIPS

*Institute of Australian Consulting Arboriculturists*

*Australian Institute of Horticulture*

*Arboriculture Australia*

*Gosford City Council Tree Protection Committee - Committee Member - August 1998 to June 2004.*