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**ARBORICULTURAL IMPACT ASSESSMENT  
REPORT- AMMENDMENT 2**

**Penola Catholic College**

445-465 Camp Road Broadmeadows VIC  
(Accessed at 29A Gibson Street)

25<sup>th</sup> June 2021

Report Commissioned By

Mcildowie Partners.

[tdilorenzo@mcildowiepartners.com.au](mailto:tdilorenzo@mcildowiepartners.com.au)

**ADVERTISED  
PLAN**

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## 1. Executive Summary

1.1 Arborcraft Tree Services was engaged by Mcildowie Partners to undertake an Arboricultural Impact Assessment and prepare a report for the site trees located within the vicinity of proposed construction of VCE/ VCAL building to inform proposed site redevelopment. The Primary objective of the Arboricultural report include;

- Provide information on the species, origin, tree dimensions, health and structure of the trees specific to the site location of this project that may be impacted either directly or indirectly by the proposed development.
- Determine trees that require protection measures in accordance with Australian Standards AS4970-2009 *Protection of Trees on Development Sites*.

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1.2 Twenty-One (21) trees were assessed in total comprising of planted exotics and Australian Natives.

1.3 Trees 1, 18, 19, 20 and 21 were assessed to be of High Retention Value. These trees will not be located within the proposed development footprint, and with appropriate protection methods during construction, should not be compromised by the proposal.

1.4 Trees 2, 4, 7, 10 and 11 have been assessed to have a Medium Retention Value. Trees 2, 4 are subject to be directly impacted by the proposed development and will not be capable of retention. Tree 7 will have a minor encroachment by the proposed development but will be capable of retention with appropriate protection methods should not be compromised by the proposal. Trees 10 & 11 will not be directly impacted by the proposal.

1.5 While three medium retention trees will not be capable of retention, replacement with similar suitable specimens within the site will offset their removal.

1.6 The remaining trees 3,5,6,8,9,12-17 were assessed as low retention value trees. Trees 3,5,6 will be directly impacted by the proposed development, these trees are of either low quality in poor condition or generally provide little amenity value to the site. Low retention value trees should not constraint the proposed design.

1.7 The decision on which site trees are to be removed should be based on sound arboricultural advice and guided by arboricultural ratings attributed to each individual tree which related to combined tree condition factors such as; age, health, structure, useful life expectancy and retention value.

1.8 On the basis of future site safety and potential amenity, preference should be given to retaining trees primarily of High - Medium Retention Value in built areas or areas of increased target potential.

1.9 Tree protection measures must be put in place prior to any development for trees that are intended to remain in the landscape.

1.10 A Project Arborist should be appointed to assist in the protection of trees warranting retention.

## 2. Objectives

- 2.1 Arborcraft Tree Services was engaged by Mcildowie Partners to undertake an Arboricultural Impact Assessment and prepare a report on trees located within the vicinity of proposed construction of VCE/ VCAL building. The report aims to ascertain the status, condition and Arboricultural value of the trees specific to the site location of this project that may be impacted either directly or indirectly by the proposed development. The requirements of the Arboricultural report include;
- Assess all trees greater than three metres within the vicinity of the proposed project site to provide information on the species, origin, tree dimensions including trunk diameter at breast height (DBH) tree height, canopy width, health and structure, useful life expectancy (ULE) and Arboricultural Retention Value
  - Determine the Tree Protection and Structural Root Zones (TPZ & SRZ) in accordance with Australian Standard AS4970 - 2009 *Protection of Trees on Development Sites*
  - Provide an appropriate plan showing tree location with tree numbers, retention values and Tree Protection Zones (TPZ).

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## 3. Methodology

- 3.1 A Visual Tree Assessment (VTA) was conducted by Dylan Adcock (Dip.Arb) on the 7th of May 2021. Trees assessed were inspected from the ground and observations were made of the surrounding area.
- 3.2 Tree locations were recorded on an *Apple iPad* using *Fulcrum* data collection app.
- 3.3 Observations were made of the assessed trees to determine the species, age and condition, estimated tree height and canopy width and trunk dimensions (measured at 1.4m above ground level with a diameter tape).
- 3.4 Assessment details of individual trees are listed within *Appendix 1 Tree Data* and a copy of the tree location plan can be observed in *Section 6 Observations*. Characteristic Descriptors used in the assessment can be seen in *Appendix 3*.
- 3.5 Each tree assessed was attributed a 'Tree Retention Value' this value correlated the combination of tree health and structural rating with tree amenity value. Tree Retention Value matrix can be observed within *Appendix 4*.
- 3.6 Each tree assessed has an allocated Tree Protection Zone (TPZ). The TPZ have been measured and allocated within accordance of Australian Standard AS4970-2009 *Protection of Trees of Development Sites*. Tree Protection Zone (TPZ) is measured as a radius, from the centre of the trunk at (or near) ground level.
- 3.7 Trees outside of the proposed project site have not been included.

#### 4. Documents Reviewed

- 4.1 The following information was provided for the preparation of this assessment:
- *PENOLA CATHOLIC COLLEGE, BROADMEADOWS PROPOSED YEAR VCE / VCAL BUILDING*  
*Mcildowie Partners.*

#### 5. Local Government Permit Requirements

- 5.1 The subject site is located within Hume City Council. The following Planning Scheme applies;

- GRZ1 General Residential Zone - Schedule 1.
- Heritage Overlay - Schedule (HO207)

- 5.2 in accordance with the heritage overlay planning provision a planning permit is required to remove, destroy or lop a tree if the schedule to this overlay specifies the heritage place as one where tree controls apply. This does not apply:

- To any action which is necessary to keep the whole or any party of a tree clear of an electric line provided the action is carried out in accordance with a code of practice prepared under section 86 of the *Electricity safety Act 1998*

- If the tree presents an immediate risk of personal injury or damage to property.

- 5.3 Under the Schedule of the heritage overlay (HO207) Pasture Hill Farm/Kerrslan/ St Joseph's founding Home tree controls do not apply.

#### 5.4 Native Vegetation - Hume Planning Scheme

A permit is required to remove, destroy or lop native vegetation, including dead native vegetation. This does not apply:

- If the table to Clause 52.17-7 specifically states that a permit is not required.

- if a native vegetation precinct plan corresponding to the land is incorporated into this scheme and listed in the schedule to Clause 52.16.

- To the removal, destruction or lopping of native vegetation specified in the schedule to this clause.

- 5.5 **\*\*\*Note Clause 52.17 (Native Vegetation) - NO Victorian Native will require removal as a part of the current design.**

- 5.4 The Following link is of the Hume Council "Biodiversity Planning Policy"

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<https://www.hume.vic.gov.au/files/sharedassets/public/your-council/policies-and-report/council-policies/pol150-biodiversity-planning-policy.pdf>

- 5.4 Hume Council “Biodiversity Planning Policy” applies to any proposed precinct structure plan, development plan, planning permit application or equivalent which has the potential to impact on native vegetation, scattered indigenous trees or waterway. This policy may also provide guidelines to the removal of non-indigenous vegetation that falls outside of the Hume planning scheme where the vegetation acts to contribute to the objectives of this policy.

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**6. Observations**

- 6.1 A total of Twenty-One (21) trees were assessed. The population of assessed trees comprised of various exotic and Australian native species that are all planted amenity tree specimens.
- 6.2 A section of the school grounds has been selected for a proposed building. Within this site are two existing classrooms and one maintenance shed all to be demolished.
- 6.3 Trees 2-6, are Medium and Low Retention Value Trees Located within the development footprint and would require removal for the development to proceed as currently proposed.
- 6.4 Trees 8-10,12-17 are Low Retention Value trees located outside of the proposed development footprint and will not require removal for the development to proceed.
- 6.5 Trees 1, 7, 11,18-21 are High and Medium Retention Value trees located outside of the proposed development footprint and will not require removal for the development to proceed.
- 6.6 Trees displayed on plans that have not been included in this report are under three metres in height, if these trees were subject for removal, they could easily be offset and replaced by similar specimens or local indigenous/Native specimens.

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Figure 1. Overhead Site Image existing buildings.

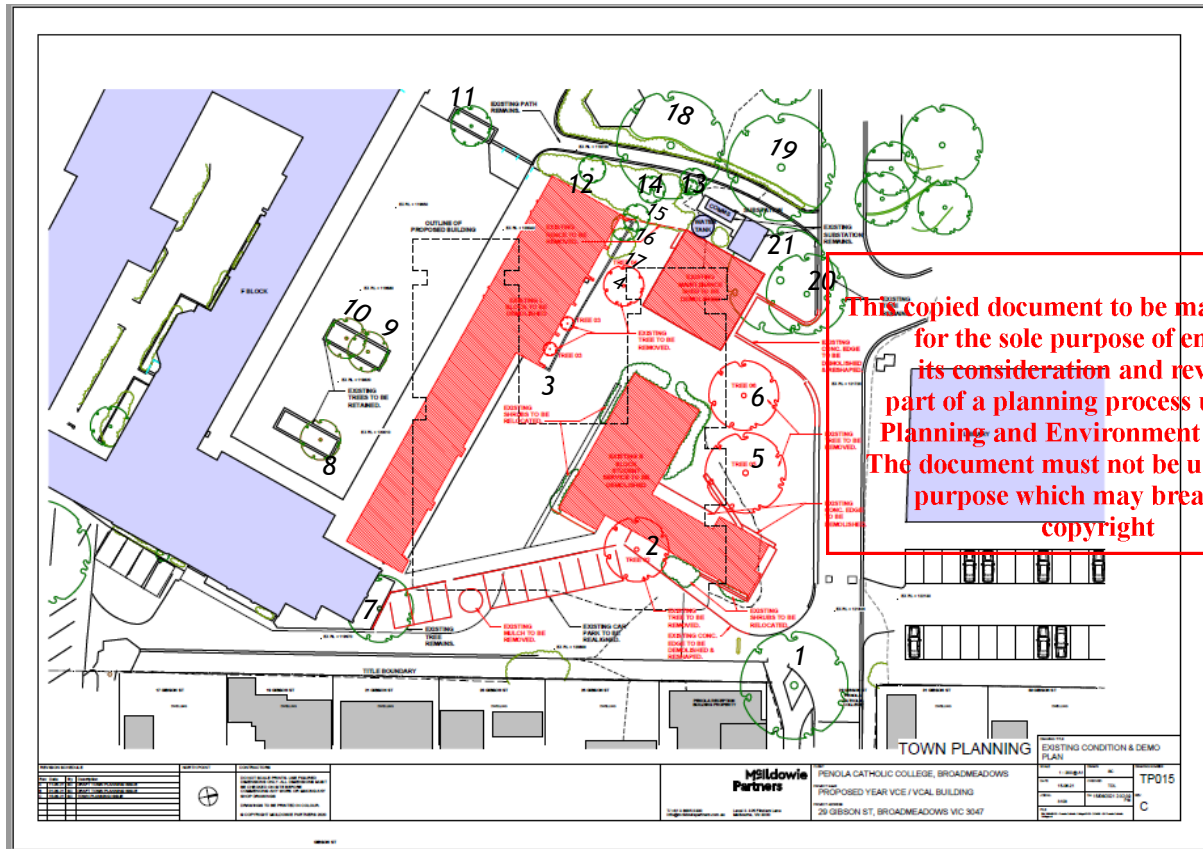


Figure 2. Site Demolition plan displaying trees with red proposed for removal. (Green depicts subject for retention while Red depicts subject for removal).



## 7. Discussion

### 7.1 Tree Retention Value

7.1.1 Trees that provide important environmental and/or aesthetic contribution to the area and are in good condition scored a High or Medium retention value and conservation of these trees is encouraged. Trees identified as not suitable for retention or attained a low Tree Retention Rating, displayed one or a number of the following attributes:

- a. provide limited environmental/aesthetic benefit,
- b. short lived species,
- c. represent a material risk to persons or property,
- d. identified as causing or threatening to cause substantial damage to the structure of value,
- e. limited Useful Life Expectancy.
- f. young and easily replaced.

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7.1.2 See Appendix 4 for further details in relation to Tree Retention Value

### 7.2 High Retention Value Trees

7.2.1 As part of this assessment Five (5) specimens were observed to be of High Retention Value

7.2.2 The Following table details all High Retention Value trees

Tree #	Origin	Botanical Name	Common Name	Retention Value
1	Australian Native	<i>Angophora costata</i>	Smooth Barked Apple	High
		<i>Eucalyptus</i>	Myrtle	
18	Indigenous	<i>camaldulensis</i>	River Red Gum	High
19	Indigenous	<i>Eucalyptus sideroxylon</i>	Red Ironbark	High
		<i>Casuarina</i>		
20	Australian Native	<i>cunninghamiana</i>	River She-oak	High
		<i>Casuarina</i>		
21	Australian Native	<i>cunninghamiana</i>	River She-oak	High

*Table 1 High Retention Value Trees*

### 7.3 Medium Retention Value Trees

7.3.1 As part of this assessment Five (5) specimens were observed to be of Medium Retention Value.

7.3.2 The Following table details all Medium Retention Value trees

Tree #	Origin	Botanical Name	Common Name	Retention Value
2	Australian Native	<i>Lagunaria patersonii</i>	Norfolk Island Hibiscus	Medium
4	Exotic	<i>Photinia robusta</i>	Red Leaf Photinia	Medium
7	Australian Native	<i>Banksia integrifolia</i>	Coastal Banksia	Medium
10	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	Medium
11	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	Medium

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Table 2 Medium Retention Value Trees

### 7.4 Low Retention Value Trees

7.4.1 As part of this assessment Eleven (11) specimens were observed to be of Low Retention Value.

7.3.2 The Following table details all Medium Retention Value trees

Tree #	Origin	Botanical Name	Common Name	Retention Value
3	Exotic	<i>Trachycarpus fortunei</i>	Chinese Fan Palm	Low
5	Exotic	<i>Fraxinus angustifolia</i>	Desert Ash	Low
6	Exotic	<i>Acer negundo</i>	Box Elder Maple	Low
8	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	Low
9	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	Low
12	Exotic	<i>Robinia pseudoacacia</i>	Black Locust	Low
13	Exotic	<i>Robinia pseudoacacia</i>	Black Locust	Low
14	Exotic	<i>Robinia pseudoacacia</i>	Black Locust	Low
15	Exotic	<i>Photinia robusta</i>	Red Leaf Photinia	Low
16	Australian Native	<i>Melaleuca linariifolia</i>	Snow in Summer	Low
17	Exotic	<i>Photinia robusta</i>	Red Leaf Photinia	Low

Table 3 Low Retention Value Trees

## 8. Tree Protection

8.1 Australian Standard AS4970-2009 *Protection of trees on development sites* prescribes the use of a Tree Protection Zone (TPZ) as the principle means of protecting trees throughout the development process. If encroachment is required within any TPZ, the Project Arborist should be consulted to identify impacts and recommend mitigation measures. The Tree Protection Zones should be used to inform any future development of the site, maintaining these areas as open space.

8.2 Below is a list of the Tree Protection Zones and Structural Zone for each tree. These measurements that should be considered during any planning. Each measurement is given in metres as a radius from the trunk centre. Trees recommended for removal are not included within this list.

8.3 Tree Protection Zones as follows:

Tree #	Botanical Name	Common Name	Retention Value	TPZ [m]	SRZ [m]
1	<i>Angophora costata</i>	Smooth Barked Apple Myrtle	High	9.32	3.01
2	<i>Lagunaria patersonii</i>	Norfolk Island Hibiscus	Medium	7.26	2.74
3	<i>Trachycarpus fortunei</i>	Chinese Fan Palm	Low	1.91	1.53
4	<i>Photinia robusta</i>	Red Leaf Photinia	Medium	1.91	2.29
5	<i>Fraxinus angustifolia</i>	Desert Ash	Low	10.92	3.29
6	<i>Acer negundo</i>	Box Elder Maple	Low	6.11	2.56
7	<i>Banksia integrifolia</i>	Coastal Banksia	Medium	6.53	2.62
8	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Low	5.16	2.36
9	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Low	3.62	2.06
10	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Medium	3.82	2.10
11	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Medium	3.25	2.05
12	<i>Robinia pseudoacacia</i>	Black Locust	Low	2.00	1.50
13	<i>Robinia pseudoacacia</i>	Black Locust	Low	2.00	1.50
14	<i>Robinia pseudoacacia</i>	Black Locust	Low	2.00	1.50
15	<i>Photinia robusta</i>	Red Leaf Photinia	Low	2.00	1.50
16	<i>Melaleuca linariifolia</i>	Snow in Summer	Low	2.00	1.50
17	<i>Photinia robusta</i>	Red Leaf Photinia	Low	2.00	1.50

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Tree #	Botanical Name	Common Name	Retention Value	TPZ [m]	SRZ [m]
18	<i>Eucalyptus camaldulensis</i>	River Red Gum	High	7.79	3.13
19	<i>Eucalyptus sideroxylon</i>	Red Ironbark	High	7.45	3.38
20	<i>Casuarina cunninghamiana</i>	River She-oak	High	5.69	2.85
21	<i>Casuarina cunninghamiana</i>	River She-oak	High	8.02	3.15

Table 4 Tree Protection Zone Measurements

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- 8.4 Ideally all works should be excluded from the *Structural Root Zone (SRZ)* of any retained tree. It is within this area that those roots are responsible for anchoring the trees in the soil are likely to be found. Damage caused to these roots may cause the tree to become unstable.
- 8.5 New works within the Tree Protection Zone should be minimised. Any intrusion into a Tree Protection Zone of greater than 10% (measured in m<sup>2</sup> of the total area of the radial Tree Protection Zone) is considered unacceptable in accordance with AS 4970 - 2009 Protection of trees on development sites. An intrusion of greater than 10% may be manageable but requires review by the Project Arborist to ascertain acceptability based on the specific conditions and any management criteria that may be applicable.

### 8.6 Tree Protection Zone Incursion

8.6.1 The following table indicates the percentage of incursion with a tree's protection zone, as per the Australian Standard AS4970-2009 Protection of Trees on Development Sites <10% incursion is deemed a minor and >10% incursion is deemed a major incursion.

Tree #	Botanical Name	Common Name	Retention Value	Conflict Level	TPZ incursion %
1	<i>Angophora costata</i>	Smooth Barked Apple Myrtle	High	None	0%
2	<i>Lagunaria patersonii</i>	Norfolk Island Hibiscus	Medium	Major	100%
3	<i>Trachycarpus fortunei</i>	Chinese Fan Palm	Low	None	0%
4	<i>Photinia robusta</i>	Red Leaf Photinia	Medium	Major	100%
5	<i>Fraxinus angustifolia</i>	Desert Ash	Low	Major	34.42%
6	<i>Acer negundo</i>	Box Elder Maple	Low	Major	24.7%
7	<i>Banksia integrifolia</i>	Coastal Banksia	Medium	Minor	9.8%
8	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Low	Major	0%
9	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Low	Major	0%

<i>Tree #</i>	<i>Botanical Name</i>	<i>Common Name</i>	<i>Retention Value</i>	<i>Conflict Level</i>	<i>TPZ incursion %</i>
10	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Medium	Major	0%
11	<i>Pyrus calleryana 'Bradford'</i>	Bradford Pear	Medium	None	0%
12	<i>Robinia pseudoacacia</i>	Black Locust	Low	None	0%
13	<i>Robinia pseudoacacia</i>	Black Locust	Low	None	0%
14	<i>Robinia pseudoacacia</i>	Black Locust	Low	None	0%
15	<i>Photinia robusta</i>	Red Leaf Photinia	Low	Minor	0.8%
16	<i>Melaleuca linariifolia</i>	Snow in Summer	Low	Minor	8.29%
17	<i>Photinia robusta</i>	Red Leaf Photinia	Low	None	0%
18	<i>Eucalyptus camaldulensis</i>	River Red Gum	High	None	0%
19	<i>Eucalyptus sideroxylon</i>	Red Ironbark	High	None	0%
20	<i>Casuarina cunninghamiana</i>	River She-oak	High	None	0%
21	<i>Casuarina cunninghamiana</i>	River She-oak	High	Minor	0.1%

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*Table 5 Tree Protection Zone incursions*

## 9. Conclusions

- 9.1 The retention of trees on site will be dependent on development and landscape plans endorsed by Hume City Council and/or relevant authorities.
- 9.2 High Retention Value trees **must be included** in future site surveys for development of this site. Tree Protection Zones (TPZ) & Structural Root Zones (SRZ) (see section 8.3) should be included and clearly displayed in site development building plans for submission to council
- 9.3 Low Retention Value trees should not be a constraint on development plans and may be considered for removal.
- 9.4 Trees 2,4-6 will be incurred by greater than 10% and will not remain viable if retained, these trees will require removal to compensate for the proposed development, these trees are of medium - low retention value and can easily be replaced through replanting
- 9.5 Trees 7,15,16 & 21 will be incurred by less than 10% and will remain viable if retained, if retained works within the tree protection zones of these trees should be supervised by the assigned project arborist.
- 9.6 Trees 1,3, 8-14 & 17-20 will not be impacted by the proposed development are will remain viable into the future.
- 9.7 Tree protection measures must be implemented prior to commencement of any development on this site.

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## 10. Recommendations

The Following recommendations are in accordance with industry best practices and with *Australian Standard AS4970-2009 Protection of Trees on Development Sites*.

- 10.1 Engage a Project Arborist to develop a *Tree Protection Management Plan* for all assessed trees to be retained.
- 10.2 Trees subject for removal should be offset with replanting of suitable trees of similar shape and size or local indigenous specimens
- 10.3 Works proposed within the Tree Protection Zones of trees subject to retention must be conducted under the supervision of a project arborist.

Arboricultural Impact Assessment report written by:



**Dylan Adcock**  
 Consulting Arborist  
 Diploma of Arboriculture (AQF5)  
[d.adcock@arborcrafttreeservices.com.au](mailto:d.adcock@arborcrafttreeservices.com.au)

Arboricultural Impact Assessment Amended by:



**Ricky Howell**  
 Senior Arborist  
 Diploma of Arboriculture (AQF5)  
[rhowell@arborcrafttreeservices.com.au](mailto:rhowell@arborcrafttreeservices.com.au)

*If you have any further questions in regard to this report or any other Arboricultural concerns, please do not hesitate to contact me at [rhowell@arborcrafttreeservices.com.au](mailto:rhowell@arborcrafttreeservices.com.au)*



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Harris, Matheny, Clark, 2003, *Arboriculture: Integrated Management of Landscape Trees, Shrubs, and Vines* (4th Edition), Prentice Hall

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Standards Australia 2009, AS 4970-2009 Protection of trees on development sites, Sydney

Standards Australia 2007, AS4373-2007 Pruning of Amenity Trees, Sydney

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## 12. Appendix 1 Tree Data

tree #	origin	Botanical_name	common_name	height_m	crown_diameter_m	DBH_cm	DAB_cm	TPZ_m	SRZ_m	structure	age_class	useful_life_expectancy	tree_retention_value	comments
1	Australian Native	<i>Angophora costata</i>	Smooth Barked Apple Myrtle	8	5	78	79.6	9.32	3.01	Poor	Mature	20-40 years	High	
2	Australian Native	<i>Lagunaria patersonii</i>	Norfolk Island Hibiscus	6	5	61	63.7	7.26	2.74	Poor	Mature	40+ years	Medium	Previously lopped
3	Exotic	<i>Trachycarpus fortunei</i>	Chinese Fan Palm	6	1	16	15.9	1.91	1.53	Good	Mature	40+ years	Low	
4	Exotic	<i>Photinia robusta</i>	Red Leaf Photinia	4	3	16	41.4	1.91	2.29	Fair	Mature	40+ years	Medium	
5	Exotic	<i>Fraxinus angustifolia</i>	Desert Ash	5	3	91	98.7	10.9	3.29	Fair	Over Mature	10 - 20 years	Low	Senescent
6	Exotic	<i>Acer negundo</i>	Box Elder Maple	5	5	51	54.1	6.11	2.56	Fair	Mature	10 - 20 years	Low	
7	Australian Native	<i>Banksia integrifolia</i>	Coastal Banksia	6	4	54	57.3	6.53	2.62	Poor	Mature	10 - 20 years	Medium	
8	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	5	7	43	44.6	5.16	2.36	Very Poor	Mature	5 - 10 years	Low	
9	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	4	5	30	32.5	3.62	2.06	Very Poor	Mature	1 - 5 years	Low	Suppressed/ past failures
10	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	5	7	32	33.7	3.82	2.1	Poor	Mature	5 - 10 years	Medium	

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11	Exotic	<i>Pyrus calleryana</i> 'Bradford'	Bradford Pear	4	4	27	31.8	3.25	2.05	Poor	Mature	10 - 20 years	Medium	
12	Exotic	<i>Robinia pseudoacacia</i>	Black Locust	3	1	8	8	0.96	1.15	Fair	Mature	10 - 20 years	Low	
13	Exotic	<i>Robinia pseudoacacia</i>	Black Locust	3	1	8	8	0.96	1.15	Fair	Mature	10 - 20 years	Low	
14	Exotic	<i>Robinia pseudoacacia</i>	Black Locust	3	1	8	8	0.96	1.15	Fair	Mature	10 - 20 years	Low	
15	Exotic	<i>Photinia robusta</i>	Red Leaf Photinia	3	3	4.8	6.4	0.58	1.04	Poor	Semi Mature	10 - 20 years	Low	Suppressed shrub
16	Australian Native	<i>Melaleuca linariifolia</i>	Snow In Summer	2	1	3.2	6.4	0.38	1.04	Very Poor	Semi Mature	5 - 10 years	Low	Suppressed
17	Exotic	<i>Photinia robusta</i>	Red Leaf Photinia	1	1	3.2	6.4	0.38	1.04	Very Poor	Semi Mature	10 - 20 years	Low	Suppressed
18	Indigenous	<i>Eucalyptus camaldulensis</i>	River Red Gum	11	6	65	87.5	7.79	3.13	Good	Mature	40+ years	Very High	
19	Indigenous	<i>Eucalyptus sideroxylon</i>	Red Ironbark	12	6	62	105	7.45	3.38	Poor	Mature	40+ years	Very High	
20	Australian Native	<i>Casuarina cunninghamiana</i>	River She-oak	10	5	47	70	5.69	2.85	Good	Mature	40+ years	High	
21	Australian Native	<i>Casuarina cunninghamiana</i>	River She-oak	113	7	67	89.1	8.02	3.15	Good	Mature	40+ years	High	

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**13. Appendix 2 Tree Protection Zone Mapping**

*Nil.*

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## 14. Appendix 3 Characteristic Descriptors

The descriptors used within this report are derived from the accepted International Society of Arboriculture (ISA) industry standard, adjusted for localised environmental factors

### Health

Category	Vigour/Extension Growth	Decline symptoms/Dead wood	Foliage density, size, colour, intactness	Pests and or disease
Good	Above typical	None or minimal	Better than typical	None or minimal
Fair	Typical	Typical or expected	Typical	Typical, with no damage thresholds
Fair to Poor	Below typical	More than typical	Showing deficiencies	Exceeds damage thresholds
Poor	Minimal	Excessive and large amount/size	Showing severe deficiencies	Extreme and contributing to decline
Dead	N/A	N/A	N/A	N/A

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### Structure

Category	Root plate and lower stem	Trunk	Structural limbs	Outer crown and roots
Good	No damage, disease, or decay; obvious basal flare/stable in ground	No damage, disease, or decay; well tapered	Well formed, attached, spaced, and tapered.	No damage, disease, decay, or structural defect.
Fair	Minor damage or decay. Basal flare present.	Minor damage or decay	Typically formed, attached, spaced, and tapered.	Minor damage, disease, or decay; minor branch end-weight or over-extension.

<b>Fair to Poor</b>	Moderate damage or decay; minimal basal flare	Moderate damage or decay; approaching recognised thresholds	Weak, decayed or with acute branch attachments; previous branch failure evidence.	Moderate damage, disease, or decay; moderate branch end-weight or over-extension.
<b>Poor</b>	Major damage, disease, or decay; fungal fruiting bodies present. Excessive lean placing pressure on root plate	Major damage, disease, or decay; exceeds recognised thresholds; fungal fruiting bodies present. Acute lean. Stump re-sprout.	Decayed, cavities or has acute branch attachments with included bark, excessive compression flaring; failure likely.	Major damage, disease, or decay; fungal fruiting bodies present; major branch end-weight or over-extension.
<b>Very Poor</b>	Excessive damage, disease, or decay; unstable/loose in ground; altered exposure; failure probable	Excessive damage, disease, or decay; cavities. Excessive lean. Stump re-sprout.	Decayed, cavities or branch attachments with active split; failure imminent.	Excessive damage, disease, or decay; excessive branch end-weight or over-extension.

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### Age

<b>Category</b>	<b>Description</b>
<b>Juvenile</b>	Young trees that are yet to reach one third of their expected size, generally less than 10 years old
<b>Semi-Mature</b>	Trees which have reached approximately half of their expected size and are less than one third of the way through their expected lifespan; species and location dependent
<b>Mature</b>	Trees which have reached their expected size and are between one third and two thirds of the way through their expected lifespan' species and location dependent
<b>Over-Mature</b>	Trees which have over-matured within the surrounding landscape and present symptoms of decline; tip dieback, fungal decay, branch shedding, pest infestation
<b>Dead</b>	Trees which present a non-functional crown, stem cambium completely dead, and no evidence of root suckering or lignotuberous sprouting



ULE

Category	Description
Dead	<ul style="list-style-type: none"> <li>• Dead trees</li> </ul>
1-5 years	<ul style="list-style-type: none"> <li>• Declining trees through disease or inhospitable conditions</li> <li>• Dangerous trees through instability or recent loss of adjacent trees</li> <li>• Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form</li> <li>• Damaged trees that are considered unsafe to retain</li> <li>• Trees that are listed as noxious weeds in the subject area</li> <li>• Trees conflicting with structures, underground utilities or hard surfaces that cannot easily be remedied through engineering solutions</li> </ul>
6-10 years	<ul style="list-style-type: none"> <li>• Trees that may only live for 5 to 10 years</li> <li>• Trees that may live for more than 10 years but would be removed to allow for new plantings</li> <li>• Trees that may live for more than 10 years but would be removed during the course of normal management for safety or nuisance reasons</li> <li>• Defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term</li> </ul>
11-20 years	<ul style="list-style-type: none"> <li>• Trees that may only live between 11 and 20 years</li> <li>• Trees that may live for more than 20 years but would be removed to allow for new plantings</li> <li>• Trees that may live for more than 20 years but would be removed during the course of normal management for safety or nuisance reasons</li> <li>• Minimally defective trees that can be made suitable for retention in the medium term by remedial arboricultural practices</li> </ul>
20-40/40+ years	<ul style="list-style-type: none"> <li>• Structurally sound trees located in positions that can accommodate future growth</li> <li>• Minimally defective trees that could be made suitable for retention in the long term by remedial arboricultural practices</li> <li>• Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention</li> </ul>

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## 15. Appendix 4 Tree Retention Value (TRV)

The Tree Retention Value was conducted assessing Tree Health and Structure (TRR Matrix 1) and then assessing this result against the estimated Useful Life Expectancy (TRR Matrix 2). These results were then assessed against the recognised environmental and social benefits that the tree presents (TRR Matrix 2) thereby providing a quantitative measure to determine the tree retention value.

TRR Matrix 1: Structure and Health

Structure	Health			
	Good	Fair	Poor	Dead
Good	A1	A1	A2	A3
Fair	A1	A2	A2	A3
Poor	A3	A3	A3	A3

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TRR Matrix 2: Expectancy and Structure/Health

ULE	TRV Matrix 1		
	A1	A2	A3
Long	High	High	Medium
Medium	High	Medium	Medium
Short	Low	Low	Low
Dead	Low	Low	Low

Tree Retention Rating

Amenity Value	TRV Matrix 2		
	High	Medium	Low
Meets all Criteria	High	High	Medium
Rare and or Endangered	High	High	Medium
Environmental Habitat	High	Medium	Medium
Amenity Character	High	Medium	Low
Minor Contribution i.e. shade/aesthetics	Medium	Low	Low
Small or Young Tree	Low	Low	Low

**High Retention Value** These trees are considered important and should be retained and protected using measures from AS4970-2009 *Protection of Trees on Development Sites*.

**Medium Retention Value** These trees are considered for retention and protected under measures from AS4970-2009 *Protection of Trees on Development Sites*.

**Low Retention Value** These trees are considered as not requiring special works or design modifications.

**16. Appendix 5 Tree Protection Measures**

**16.1 Tree Protection Zones**

Tree Protection Zones (TPZ) are the principal means of protecting trees on development sites and are defined by *AS 4970-2009 Protection of trees on development sites (Standards Australia, 2009)*. Provided below is an outline of how TPZs are defined, restrictions on activities within TPZs (see following section) and calculations to measure TPZs.

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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), described in section 2.2.2. As defined in AS 4970-2009, the radius of the TPZ for an individual tree is calculated as follows:

$$TPZ = DBH \times 12$$

Where DBH = trunk diameter, measured at 1.4m above ground level

A TPZ should not be less than 2m nor greater than 15m (except where crown protection is required). It may be possible to encroach into or make variations to the standard TPZ. This is further outlined in section 3.3 of *AS4970-2009 Protection of Trees on Development Sites*

**16.2 Structural Root Zones**

The Structural Root Zone (SRZ) is an area considered essential for tree stability: loss of roots in this area are likely to cause the tree to become unstable in the ground. As defined in AS 4970-2009, the radius of the SRZ for an individual tree is calculated as follows:

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

Where D = trunk diameter in metres, measured above the root buttress

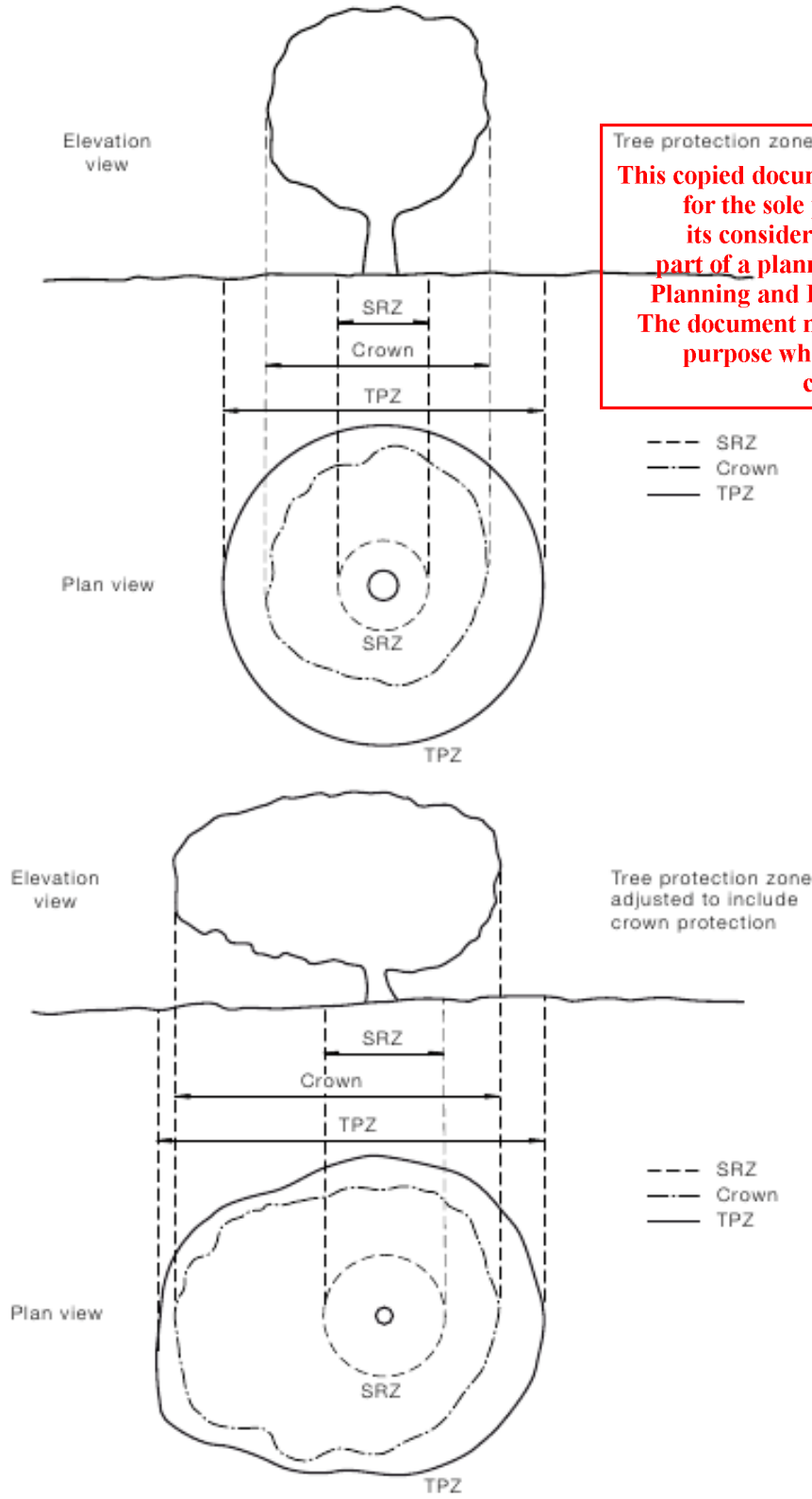
### **16.3 Restricted Activities with a Tree Protection Zone**

Activities excluded from the TPZ (AS 4970-2009) include but are not limited to:

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

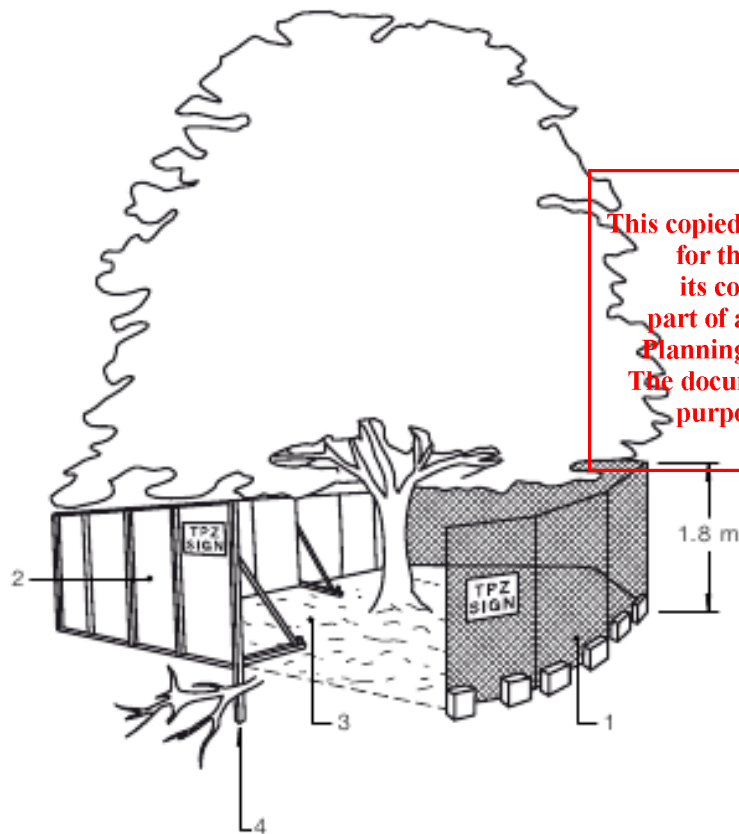
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**16.4 Indicative Tree Protection Zone**



**Tree protection zone**  
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**16.5 Indicative Tree Protection Fencing**

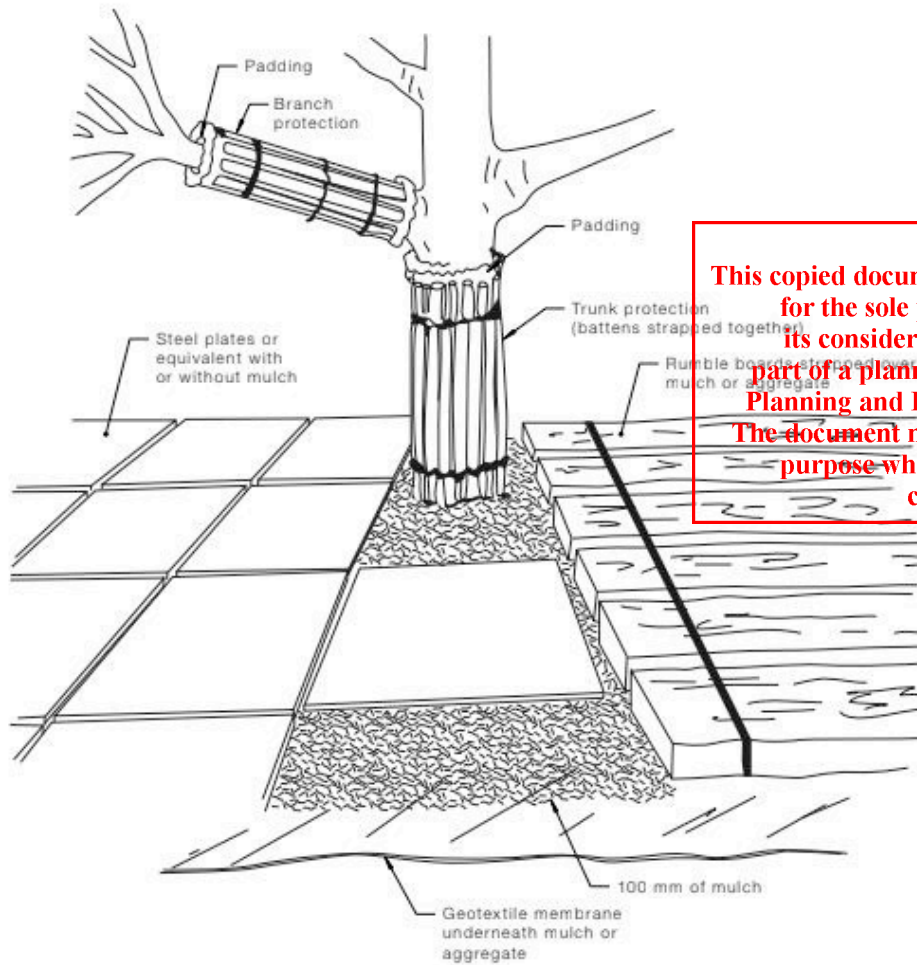


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**LEGEND:**

- 1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
- 2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
- 3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
- 4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.





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**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 of a suitable thickness to prevent soil compaction and root damage.

16.6 *Indicative Tree Protection Zone Signage*



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