

# **Arboricultural Impact Assessment Report & Tree Management Plan**

**Prepared for**  
Penrith City Council

**Property**  
27A Phoenix Crescent  
Erskine Park

**Date**  
December 2021  
Revision A



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## **1 Introduction**

- 1.1 The following Arboricultural Impact Assessment report was commissioned by Penrith City Council. The report is an assessment of fourteen trees within proximity to the proposed subdivision 27A Phoenix Crescent, Erskine Park.
- 1.2 The aim is to determine the tree's landscape significance, condition and vigour, assess the impacts of the proposed subdivision and provide an arboricultural method statement and tree management plan to ensure retained trees are protected from the adverse impacts of construction.
- 1.3 The proposal entails subdivision of the reserve into three lots, two of which will be residential development.
- 1.4 The subdivision and potential building and driveway footprint will require the removal of eleven trees, including one high retention value, three less critical for retention and seven low retention value trees. Of the low retention value specimens, Tree 6 contains hollows which may be of habitat value. It is feasible to retain three high retention value trees provided the proposed building footprint, underground services and landscaping afford a minor and acceptable encroachment of < 10% of the TPZ.

## **2 Methodology**

- 2.1 The trees were visually inspected from ground level to determine the crown condition, class, structural defects, decay, signs of stress, epicormic growth and dieback (refer Appendix A & B)
- 2.2 Useful Life Expectancy (ULE) was determined. A ULE rating provides an estimate of a tree's expected remaining life span and considers the current age, condition, vitality and life span of the species (refer Appendix B).
- 2.3 A Significance of a Tree Assessment Rating System (STARS) was determined. A STARS rating establishes the contribution of a tree to the overall landscape, amenity qualities or importance due to species, size, historical/cultural planting or significance to the site (refer Appendix C).
- 2.4 No root exploration, internal probing or aerial inspection was performed.
- 2.5 Tree height was measured with a Nikon Forestry Pro and rounded to the nearest metre. Canopy spread, and tree age were estimated. Diameter at Breast Height (DBH) and Diameter Above Root Buttress (DRB) were measured.
- 2.6 The comments and recommendations in this report are based on findings from a site inspection on 27 October 2021.
- 2.7 To maintain continuity tree numbers correspond to the Preliminary Arboricultural Assessment Report dated 10 November 2015 by Glenyss Laws.
- 2.8 A list of literature used in the preparation of this report is provided in the bibliography section.

2.9 Plans sighted in the preparation of the report include:

- Plan of Detail and Levels dated 22/7/20 Version A by Richard Hogan and Company.
- Plan of Proposed Subdivision dated 2021 by Richard Hogan and Company.
- Engineering Plans Sheet No DA301 Issue A dated 14/12/21 by J Wyndham Prince

### 3 Observations

#### 3.1 The Site

- 3.1.1 The site is public reserve identified as Lot 1444, DP 788282, known as 27A Pacific Drive, Erskine Park. The property is bounded by Pacific Rd to the north and Phoenix Cres to the south and residential properties to the east and west (refer Figure 1).

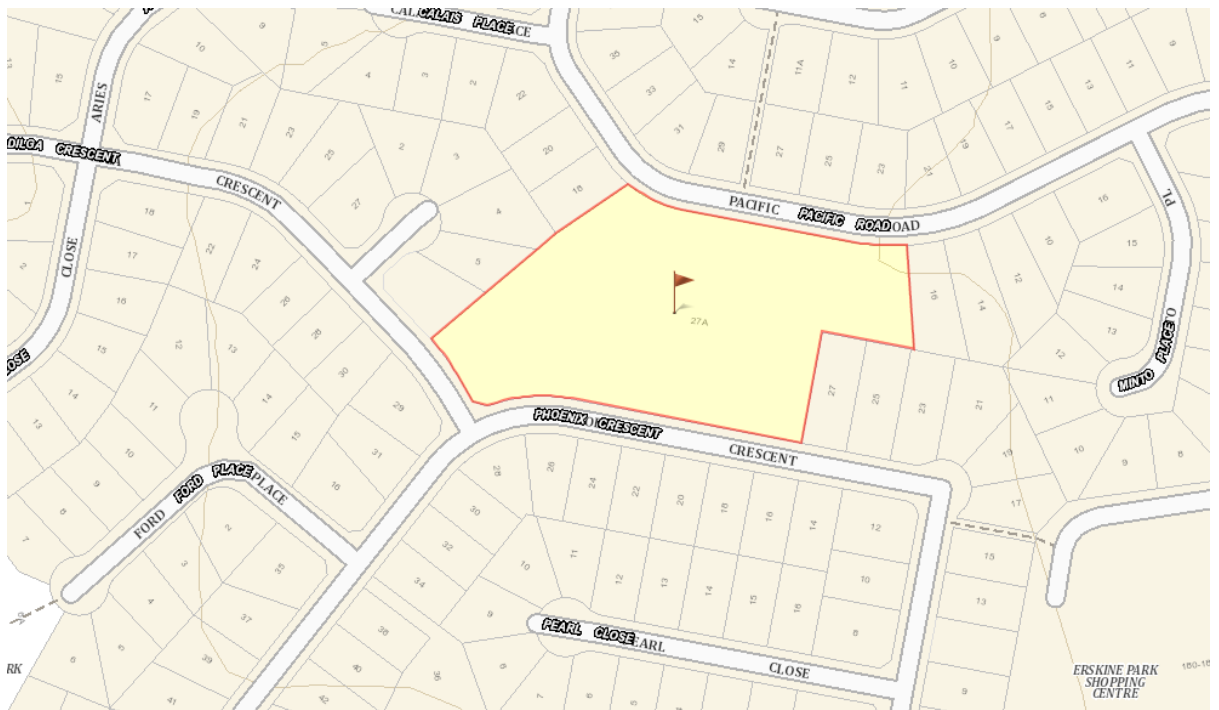


Figure 1. Location Phoenix and Pacific Reserve, 27A Phoenix Crescent Erskine Park (NSW Six Maps <https://maps.six.nsw.gov.au/> )

#### 3.2 The Trees

- 3.2.1 Details of the trees, their dimensions, condition, Useful Life Expectancy (ULE) and landscape significance (STARS) is attached in Appendix A.
- 3.2.2 Trees 11 & 16 have been removed or have died since the 2015 site inspection and Preliminary Assessment Report, subsequently they were not plotted within the survey plan.

## **4 Discussion**

### **4.1 Tree Protection, Ecological and Heritage Significance**

4.1.1 Tree Management Controls Penrith City Council applies under DCP 2014 and SEPP 2017 – Vegetation in Non-Rural Areas and State Environmental Planning Policy No 19—Bushland in Urban Areas. The Tree Management Controls protect:

- Any native tree (both living and dead) or other vegetation that is on land zoned E2 Environmental Conservation in the Penrith LEP 2010 Land Zoning Map, or on natural resources sensitive land identified in the Penrith LEP 2010 Natural Resources Sensitivity Land Map.
- In all areas, any native vegetation community including remnant native vegetation.
- In all areas, any tree or other vegetation whether native or introduced having a height of 3.5 metres or more or a trunk diameter exceeding 100mm at 1.4m above ground level.
- Any tree or other vegetation that is, or forms part of, a heritage item or is within a heritage conservation area.
- Any tree or other vegetation that is culturally, socially or biologically significant or a unique specimen and has been formally recognised by an appropriate government authority (e.g. a significant tree or vegetation register).

4.1.2 The subject property is not contained within one of Council's Heritage Conservation Areas nor is the property listed as an item of heritage under Sheet HER 020 of LEP 2010.

4.1.3 The reserve is not identified as being of sensitive land within Council's LEP 2010 Natural Resources Sensitivity Land Map, Sheet NRL 020.

4.1.4 However, the reserve is identified as being of biodiversity significance within the NSW Department of Planning, Industry and Environment Biodiversity Values Map (<https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap> accessed 12/11/21).

4.1.5 Trees 1, 2, 3, 6, 12 & 13 are identified as locally occurring *Eucalyptus moluccana* (Grey Box), *Eucalyptus tereticornis* (Grey Gum) and *Eucalyptus fibrosa* (Red Ironbark). Tree 6 has been lopped and retained as a habitat tree, there are 2 cavities/hollows at approx. 12m from ground level which may be suitable as habitat for wildlife.

### **4.2 Tree Retention Value and Landscape Significance**

4.2.1 It is possible to determine a tree's significance and retention value based upon several factors including size, condition and maturity coupled with the methodologies STARS and ULE.

4.2.2 Generally trees identified as having a medium to long ULE and of high landscape value, street trees and trees on adjoining properties are given a high priority for retention in the design process.

Trees 1, 2 & 3 fall in this category.

- 4.2.3 Trees of high landscape significance with a short ULE should not be given importance for preservation, and unless found to be habitat for endangered or critically endangered fauna, then these trees are considered to be short term prospects and are best replaced with advanced trees grown to AS2303 – 2018 Tree stock for landscape use.

Trees 6 & 12 & 13 fall in this category

- 4.2.4 Trees identified with a medium landscape value together with a medium ULE are considered less critical and should be marked for retention where possible.

Trees 9, 10 & 14 fall in this category

- 4.2.5 While trees assessed with a short ULE and a medium to low STARS value are unsuitable for retention and should be considered for removal. Unless exempt Council approval will be required prior to tree removal.

Trees 4, 5, 6, 7 & 8 fall in this category.

### **4.3 AS4970-2009 Protection of trees on development sites**

- 4.3.1 Australian Standard 4970-2009, Protection of trees on development sites, provides appropriate guidelines to ensure the long-term viability and stability of trees to be retained on development sites.

- 4.3.2 Tree Protection Zones (TPZ) are based on the diameter of the tree measured at 1.4 metres above ground level x 12 (refer Table 1 for calculated TPZ's). The TPZ is a radial distance measured from the centre of the tree's trunk to the edge of proposed works. The TPZ is an exclusion zone where construction, trenching, soil level changes and use of machinery is avoided.

- 4.3.3 The Structural Root Zone (SRZ) is the area required for stability, a far larger area is necessary to maintain a viable tree. Therefore, **no** excavation or construction shall encroach within the SRZ (refer Table 1 for calculated SRZ's). The SRZ is determined adopting the formula from AS4970-2009 where the SRZ radius =  $(D \times 50)^{0.42} \times 0.64$ . Where D = trunk diameter, in m, measured above the root buttress.

- 4.3.4 Under AS4970-2009 a minor encroachment of 10% of the area is allowable, provided this is compensated for elsewhere and contiguous to the TPZ. Should more than a 10% encroachment occur then the Project Arborist must demonstrate the tree or palm can be protected and remain in a viable state.

- 4.3.5 Under Clause 3.3.4 of AS4970 when determining the impacts of an encroachment into the TPZ, some consideration may be given to the following;

- The potential loss of root mass resulting from the encroachment determined by root mapping (number, size and percentage)
- Species tolerance to root disturbance
- Age and vigour of the trees
- or tree sensitive design construction such as pier and beam, suspended slab systems or discontinuous footings which may minimise the impact upon a tree's root system.

Tree No	DBH (cm)	DRB (cm)	TPZ Radius (m)	TPZ Area (m <sup>2</sup> )	SRZ Radius (m)
1	40	50	4.8	72	2.5
2	49	58	5.9	109	2.7
3	87	92	10.4	342	3.2
4	15	22	2.0	10	1.8
5	32	40	3.8	46	2.3
6	73	87	8.8	241	3.2
8	32	37	3.8	46	2.2
9	36	48	4.3	59	2.5
10	38	55	4.6	65	2.6
12	68	100	8.2	209	3.4
13	46	55	5.5	96	2.6
14	41	43	4.9	76	2.4
17	30	35	3.6	41	2.2

Table 1. Tree Protection and Structural Root Zones.

#### 4.4 Proposed Subdivision Impacts

- 4.4.1 Trees 1 & 2 a 4.8 & 5.9m respective TPZ applies. Provided appropriate building line setbacks are implemented is feasible to retain both specimens with a minor and acceptable encroachment of < 10%. It is recommended all underground services including stormwater management plans consider the 4.8m & 5.9m respective TPZ. In addition, it is recommended the area of landscape within the TPZ's be maintained as soft landscaping and exclude soil level changes, hard surfaces and retaining walls.
- 4.4.2 Due to their location within the proposed Lots, Trees 3, 4, 5, 7, 8, 9, 10, 11, 12, 13 & 14 are likely to fall within the footprint or the proposed building layout will constitute a major TPZ/SRZ encroachment. The trees are assessed with a medium to low retention value, their removal should not be seen as a constraint to the subdivision or residential development.
- 4.4.3 Tree 6 an 8.8m TPZ applies, the proposed regrading falls within the tree's footprint, while the future driveway will constitute a major TPZ/SRZ encroachment of the 8.8m TPZ.
- 4.4.4 Tree 17 a 3.6m TPZ applies, provided a minimum 4m building setback is conditioned, there is unlikely to be any encroachment of the TPZ. Proposed stormwater management and landscaping are potential future impacts, however these can be managed with appropriate design and consideration of the 3.6m TPZ.

## 5 Conclusions/Recommendations

- 5.1 Fourteen (14) trees were assessed, the proposal entails subdivision of the reserve into three lots, two of which will be set aside for residential development.
- 5.2 Tree 11 has been removed since the 2015 Preliminary Assessment Report and Tree 16 is dead and was not plotted on the survey plan.
- 5.3 The proposed subdivision, regrading and potential building footprints require the removal of eleven (11) trees. This includes one (1) tree of high retention value, three (3) trees less critical for retention and seven (7) trees of low retention value. Of the low retention value specimens, Tree 6 contains cavities/hollows which may be of habitat value.

High Retention	Less Critical for Retention	Low Retention
3	9, 10 & 14	4, 5, 6, 7, 8, 12 & 13

Table 2. Potential impacts and tree removal.

- 5.4 The proposed subdivision and potential impacts indicate it is feasible to retain three high retention value trees

High Retention	Less Critical for Retention	Low Retention
1, 2 & 17	-	-

Table 3. Trees which may be retained dependent upon development layout

- 5.5 All trees to be retained shall be protected in accordance with the following Arboricultural Method Statement.

## 6 Arboricultural Method Statement

### 6.1 Pre-commencement and Arboricultural Hold Points

- 6.1.1 Prior to demolition and construction works, a Project Arborist shall be appointed to supervise all tree protection procedures detailed in this statement. The Project Arborist shall have a minimum level 5 AQF qualification in Arboriculture.
- 6.1.2 A pre-commencement site meeting shall take place between the Project Manager and the Project Arborist, the meeting is to take place before any development activity to determine specific arboricultural inspections and required tree protection.
- 6.1.3 Development Stage is subject to site monitoring by the Project Arborist at intervals as agreed at the pre-commencement site meeting. These visits are to ensure the protection measures are maintained in good order and works within the Tree Protection Zone (TPZ) meet with this Arboricultural Method Statement and AS4970.
- 6.1.4 It is the responsibility of the Project Manager to provide a minimum 3 days' notice to the Project Arborist for the pre-determined witness points.
- 6.1.5 Any breaches to the Arboricultural Method Statement shall be reported immediately.
- 6.1.6 The following pre-determined stages are Project Arborist hold points to document the works and demonstrate an inspection has taken place.



Hold Point	Action	Project Arborist Supervision
<b>Tree Protection</b>	The Site Arborist shall inspect the Tree Protection Fencing and any necessary Ground Protection complies with Appendix E & F and section 6.2.	Inspected, documented & certified by Project Arborist
<b>Machinery Access</b>	An access route for machinery shall be determined prior to construction works. Any temporary ground protection within the Tree Protection Zones shall be undertaken as per Appendix E & F and section 6.2	Inspected, documented & certified by Project Arborist
<b>Earth Works</b>	The Site Arborist to monitor any earthworks within the TPZ's. <b>Note</b> these works must be undertaken by hand or with an air knife.	Inspected, documented & certified by Project Arborist
<b>Practical Completion</b>	The Site Arborist to inspect and assess the trees condition and provide certification of tree protection at all the above-mentioned Hold Points.	Inspected, documented & certified by Project Arborist

Table 4. Hold Points for Project Arborist Inspections

## 6.2 Tree Protection – to be installed prior to commencement of works

- 6.2.1 Tree Protection Fencing shall be installed prior to commencement of works and be maintained in a good condition during the construction processes.
- 6.2.2 Trunk Protection shall be achieved by strapping hessian or carpet underlay around the trunk followed by placing two metre lengths of timbers (100 x 50mm) spaced at 100mm intervals and secured together with galvanised wire. The timber slats shall be strapped around the trunk to avoid mechanical injury or damage. No wire/nails or securing devices shall damage or contact the trunk.
- 6.2.3 Tree Protection shall consist of a 1.8m high chain link temporary fencing erected at the distances nominated in Appendix F - Tree Protection Plan.
- 6.2.4 Weatherproof signage indicating the area is a Tree Protection Zone (TPZ) shall be displayed on the fence line at 10m intervals. Signage shall be a minimum A4 and state No Access – Tree Protection Zone and include the contact details of the Project Manager and Project Arborist.
- 6.2.5 Once erected, the TPF shall be regarded as sacrosanct and shall not be removed or altered without prior agreement of the project arborist.
- 6.2.6 Attention shall be given to ensuring the TPZ remains rigid and complete and excludes all construction activity and storage of materials.
- 6.2.7 If works occur within the TPZ the Project Arborist shall determine if appropriate ground protection is required. Ground protection shall consist of a layer of geotextile fabric spread with a 100mm layer of fine woodchip mulch and overlaid with thick recycled railway sleepers, timber planks or steel plates in accordance Appendix F.
- 6.2.8 Mulch shall be spread within the TPZ's of the retained trees or as instructed by the Project Arborist. The mulch shall consist of mixed leaf and fine woodchip mulch as certified to AS4454:2012 Composts, Soil Conditioners and Mulches. Mulch shall be spread to a depth of 75mm and maintained at this depth for the duration of works.

### **6.3 Restricted Activities**

6.3.1 The following activities are restricted within the Tree Protection Zone;

- Parking of vehicles or plant
- Installation of temporary site offices or amenities.
- Wash down areas
- No mechanical excavation
- Preparation of chemicals including paint, cement or mortar.
- Vehicular movement
- Pedestrian access
- Excavation, trenching or tunnelling unless under the supervision of the Project Arborist
- No ground level changes are permitted

### **6.4 Installation of Services**

- 6.4.1 Where feasible, all underground services will be routed & installed beyond the identified TPZ's. Where it is impossible to divert services beyond the TPZ's, detailed plans showing the proposed routing will be drawn in conjunction with advice from an AQF Level 5 Arborist.
- 6.4.2 The method for trenching within a TPZ shall either be by hand methods e.g. hand digging with a spade or trowel or an air spade. Trenchless technology such as directional underground boring shall be considered in the first instance.
- 6.4.3 Topsoil and subsoil excavated from the trench shall be deposited into separate piles and kept apart and covered until required for backfilling.
- 6.4.4 No roots > 30mm in diameter are to be severed without prior agreement with the Project Arborist.
- 6.4.5 In cases of extreme heat or unless the trench is to be backfilled within the same day, all exposed roots > 30mm in diameter shall be wrapped with damp hessian to prevent drying out.
- 6.4.6 Where is it necessary to sever any woody roots, they shall be clean cut with secateurs or a pruning saw.
- 6.4.7 The underground services shall be positioned below the network of protected roots without causing damage to roots > 30mm in diameter. The hessian shall be removed prior to backfilling.

### **6.5 Back filling**

- 6.5.1 Once works have been completed, backfilling shall be undertaken by hand using the subsoil first. The subsoil shall be filled into the trench in layers of no > 20cm and each layer shall be gently consolidated. Once the subsoil has reached the level of the existing subsoil, the topsoil shall be placed on top until the original levels are reached.

**6.6 Construction of masonry fences and retaining walls**

- 6.6.1 Where retaining walls or masonry fences are proposed, exploratory hand excavation to a depth of 600mm will determine the presence of any woody roots > 30mm in diameter. Exploratory trenching shall be under the supervision of and documented by the Project Arborist.
- 6.6.2 In cases of extreme heat or unless the footings are to be backfilled within the same day, then the exposed roots shall be covered in damp hessian until back filling takes place.
- 6.6.3 Backfill shall be undertaken in accordance with section 6.5 of the method statement.

**6.7 Soft and Hard Landscaping**

- 6.7.1 Installation of soft or hard landscaping including paving, turf or plant material within the TPZ shall be undertaken by hand.
- 6.7.2 Planting holes are to be hand dug with a shovel or garden trowel.

**6.8 Breach of tree protection**

- 6.8.1 Any above or below ground damage (including soil compaction) to a protected tree shall be reported to the Project Arborist immediately.
- 6.8.2 Where activities occur which breach the tree protection measures, the Project Arborist shall be advised immediately and work within the TPZ be halted until an assessment has been made and any mitigation measures deemed necessary have been undertaken.

Any questions relating to this arborist report should be directed to the undersigned.



### Glenyss Laws

*Graduate Certificate in Arboriculture, The University of Melbourne (AQF Level 8)*

*Diploma of Horticulture (Arboriculture) TAFE NSW (AQF Level 5)*

*Assoc Diploma Applied Science (Landscape) TAFE NSW*

*ISA Tree Risk Assessment Qualified Assessor (2014)*

*Member I.A.C.A., A.I.H & I.S.A*

*Qualified and Practicing Arborist/Horticulturist.*

*Since 1997*

### Assumptions/Disclaimer

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However, Glenyss Laws – Consulting Arborist can neither guarantee nor be responsible for the accuracy of information provided by others.

#### Unless stated otherwise:

- Information contained in this report covers only the trees that were examined and reflects the condition of the trees at the time of inspection: and
- The inspection was limited to visual examination of the subject trees without dissection, probing or coring.
- No risk assessment was commissioned or carried out as part of the investigation.
- Trees are living organisms whose health and condition can change rapidly. Any changes to the soil surrounds e.g. excavation or construction works or extreme weather events will invalidate this report.
- There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.
- Any tree, whether it has a visible weakness or not, will fail if the forces applied exceed the strength of the tree or its parts.



### BIBLIOGRAPHY/REFERENCES

Barrell J (1995). 'Pre-development Tree Assessments', in Trees and Building Sites, Proceedings of an International Conference held in the Interest of Development a Scientific Basis for Managing Trees in Proximity to Buildings. International Society of Arboriculture, Illinois, USA pp132-142.

IACA (2010) IACA Significance of a Tree, Assessment Rating System (STARS). Institute of Australian Consulting Arboriculturists, Australia, [www.iaca.org.au](http://www.iaca.org.au)

Standards Australia (2007), AS4970-2009 Protection of trees on development sites.

## APPENDIX A

### Tree Survey Notes

Tree No	Tree Species	Age Class	DBH (mm)	DRB (mm)	Tree height (m)	Crown diameter (m)	Crown condition	Crown class	STARS	ULE	Root Zone/ Defects/ Services	Comments
1	<i>Eucalyptus tereticornis</i> (Grey Gum)	M	400	500	21	6	3	C	1	2	Gr, C/-/-	Forms two leaders at 8m, union appears sound. Wound in lower trunk and associated decay measures 50 x 20cm.
2	<i>Eucalyptus fibrosa</i> (Red Ironbark)	M	490	580	22	11	3	C	1	2	Gr, C/-/-	Forms codominant leaders at 4m union is sound.
3	<i>Eucalyptus moluccana</i> (Grey Box)	M	500 & 710	920	29	12	3	C	1	2	Gr, C/-/-	Forms three leaders at 1m unions appear sound.
4	<i>Corymbia maculata</i> (Spotted Gum)	O	150	220	12	3	3	S	3	3	Gr, C/B/-	Poor vigour, heavily infested with borer in basal area to south. Planted specimen.
5	<i>Corymbia citriodora</i> (Lemon-scented Gum)	O	320	400	10	7	3	S	3	3	Gr,C/B,W/-	Excessive borer in lower trunk with associated damage measuring 27cm x 50cm. Forms two leaders at 1.3m with borer damage within branch union. Exhibits poor vigour.
6	<i>Eucalyptus tereticornis</i> (Grey Gum)	O	730	870	10	3	1	D	1	4	Gr, C/C/-	Specimen has been previously lopped and retained as a habitat tree. 2 x cavities/hollows suitable for birdlife evident at 10m (refer Appendix D).
7	<i>Eucalyptus bicostata</i> (Southern Blue Gum)	dead	-	-	10	0	0	C	3	4	Gr, C/B/-	Dead specimen (refer Appendix D).
8	<i>Eucalyptus bicostata</i> (Southern Blue Gum)	O	220 & 220	370	6	6	2	Partial S	3	3	Gr,C/B,W/-	Canopy biased to the north. Trunk on a 17° lean to the north. Wound in lower trunk 35cm x 12. Specimen forms two leaders at 1.1m. Planted specimen
9	<i>Corymbia citriodora</i> (Lemon-scented Gum)	M	360	480	18	10	3	C	2	2	Gr, C/B/-	Planted specimen

Tree No	Tree Species	Age Class	DBH (mm)	DRB (mm)	Tree height (m)	Crown diameter (m)	Crown condition	Crown class	STARS	ULE	Root Zone/ Defects/ Services	Comments
10	<i>Corymbia citriodora</i> (Lemon-scented Gum)	M	380	550	17	12	4	Partial S	2	2	Gr, C/-/-	Borer damage in lowest northern 1 <sup>st</sup> order branch attachment. Feasible to prune defective branch. Planted specimen
11	<i>Eucalyptus bicostata</i> (Southern Blue Gum)	Removed										Tree removed since 2015 inspection
12	<i>Eucalyptus moluccana</i> (Grey Box)	O	430 & 520	16	24	16	2	C	1	4	B/W/-	Forms codominant leaders near ground level. Complete dieback of southern leader. Significant borer damage in base of northern leader accounts for and has effectively ringbarked 40 - 50% of trunk circumference
13	<i>Eucalyptus moluccana</i> (Grey Box)	M	460	550	18	8	3	C	1	3	B/-/-	Failure or recent pruning of lowest northern 1 <sup>st</sup> order branches. Canopy holds minor epicormic shoots.
14	<i>Corymbia citriodora</i> (Lemon-scented Gum)	M	410	430	14	8	4	Partial S	2	2	Gr, C/-/-	Planted specimen
15	<i>Eucalyptus sp.</i>	dead	-	-	-	-	-	-	3	4	Gr, C/-/-	
16	<i>Eucalyptus bicostata</i> (Southern Blue Gum)	dead	-	-	-	-	-	-	3	4	Gr, C/-/-	
17	<i>Syzygium sp.</i> (Lilly Pilly)	M	150 x 4	350	7	4	4	C	2	2		Tree on neighbouring property. Trees on neighbouring properties are allocated a high retention value

Trees in **Green** assessed with a high landscape value coupled with a medium to long ULE are allocated a high priority for retention.

Trees in **Blue** are assessed as less critical for retention, their retention should be a priority with removal considered if all design options have been exhausted & adversely affecting the proposal.

Trees in **Pink** are of low retention value, nor require special works or design modifications to be implemented.

Tree in **Orange** are considered hazardous, in irreversible decline or environmental weed species and recommended for removal irrespective of development.

## APPENDIX B

### Notes on tree inventory schedule

Tree No:	Relates to number on site diagram.		
Species:	Botanical and Common Name		
Age Class:	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	
Height:	In metres		
Crown Spread:	In metres		
Crown Class:	D	Dominant	Crown extends above general canopy; not restricted by other trees.
	C	Co-dominant	Crown forms the bulk of the general Canopy but crowded by other trees.
	I	Intermediate	Crown extends into dominant/ codominant canopy but quite crowded on all sides.
	S	Suppressed	Crown development restricted from Overgrowing trees.
Crown Condition:	Overall vitality		
	0	Dead	
	1	Severe decline (<20% canopy density; major dead wood)	
	2	Declining (20-60% canopy density; twig and branch dieback)	
	3	Average/ low vigour (60-90% canopy density; twig dieback)	
	4	Good (90-100% canopy density; little or no dieback or other problems)	
	5	Excellent (100% canopy density; no deadwood or other problems)	
Root Zone:	C	Compaction	
	D	Damaged/wounded roots	
	E	Exposed roots	
	Ga	Tree in garden bed	
	Gi	Girdled roots	
	Gr	Grass	
	K	Kerb close to tree	
	L+	Raised soil level	
	L-	Lowered soil level	
	M	Mulched	
	Pa	Paving/concrete/bitumen	
	Pr	Roots pruned	
	O	Other	

<b>Defects:</b>	B	Borers
	C	Cavity
	D	Decay
	F	Previous failures
	I	Inclusions
	L	Lopped
	M	Mistletoe/parasites
	S	Splits/Cracks
	T	Termites
	O	Other

<b>Services adjacent structures:</b>	Bs	Bus stop
	Bu	Building within 3 metres
	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
	Si	Signage
	Sl	Street light
	T	Transmission lines
	U	Underground services
	O	Other

**STARS:** Significance of a Tree Assessment Rating System (copyright Institute of Australian Consulting Arborists 2010)

**ULE:** Useful Life Expectancy adapted from Barrell J (2001)

<b>1</b>	<b>Long ULE</b>	<b>Trees that appear to be retainable at the time of assessment for more than 40 years</b>
<b>2</b>	Medium ULE	Trees that appear to be retainable at the time of assessment for more than 15-40 years
<b>3</b>	Short ULE	Trees that appear to be retainable at the time of assessment for more than 5-15 years
<b>4</b>	Remove	Trees that are dead or in irreversible decline with a life expectancy of < 5 years.
<b>5</b>	Small, young or regularly pruned	Small trees less than 5 metres in height or young trees less than 15 years old but over 5 metres in height.



## APPENDIX C

# IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

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 the significance of a tree 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. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

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. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

## Tree Significance - Assessment Criteria

### 1. High Significance in landscape

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

### 2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

### 3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

#### Environmental Pest / Noxious Weed Species

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

#### Hazardous/Irreversible Decline

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

**The tree is to have a minimum of three (3) criteria in a category to be classified in that group.**

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

**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 prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures 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.

**USE OF THIS DOCUMENT AND REFERENCING**

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, [www.iaca.org.au](http://www.iaca.org.au)

**REFERENCES**

Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, [www.icomos.org/australia](http://www.icomos.org/australia)

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

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, [www.footprintgreen.com.au](http://www.footprintgreen.com.au)

## **APPENDIX D**

### **Site Photographs**



Figure 2. Trees 1 – 5





Figure 3. Tree 6 contains cavities of habitat value

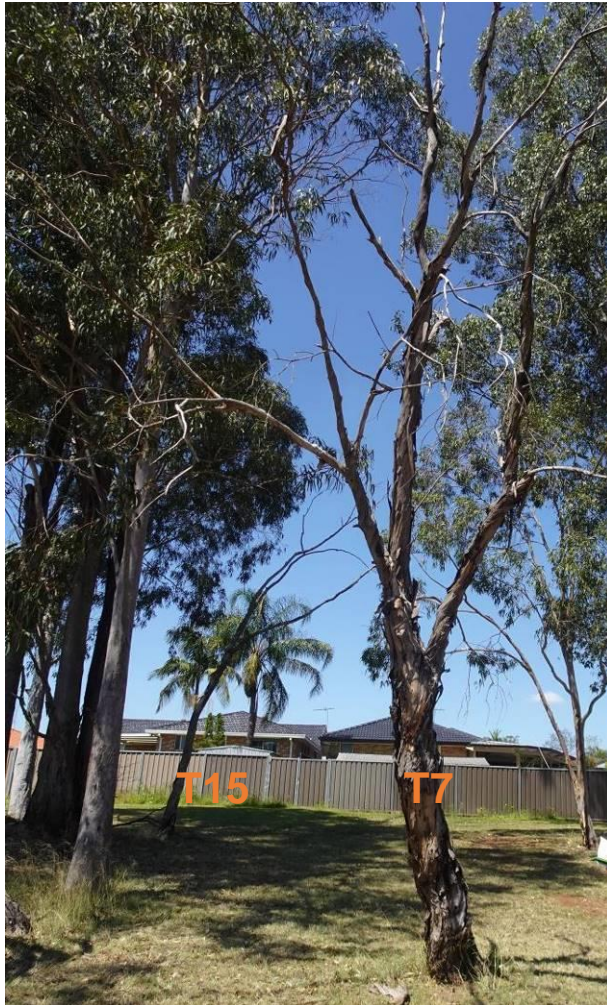


Figure 4. Dead specimens identified as Trees 7 &15



Figure 5. Lower trunk of Tree 12 heavily infested with borer, effectively ringbarking 40% of trunk circumference.

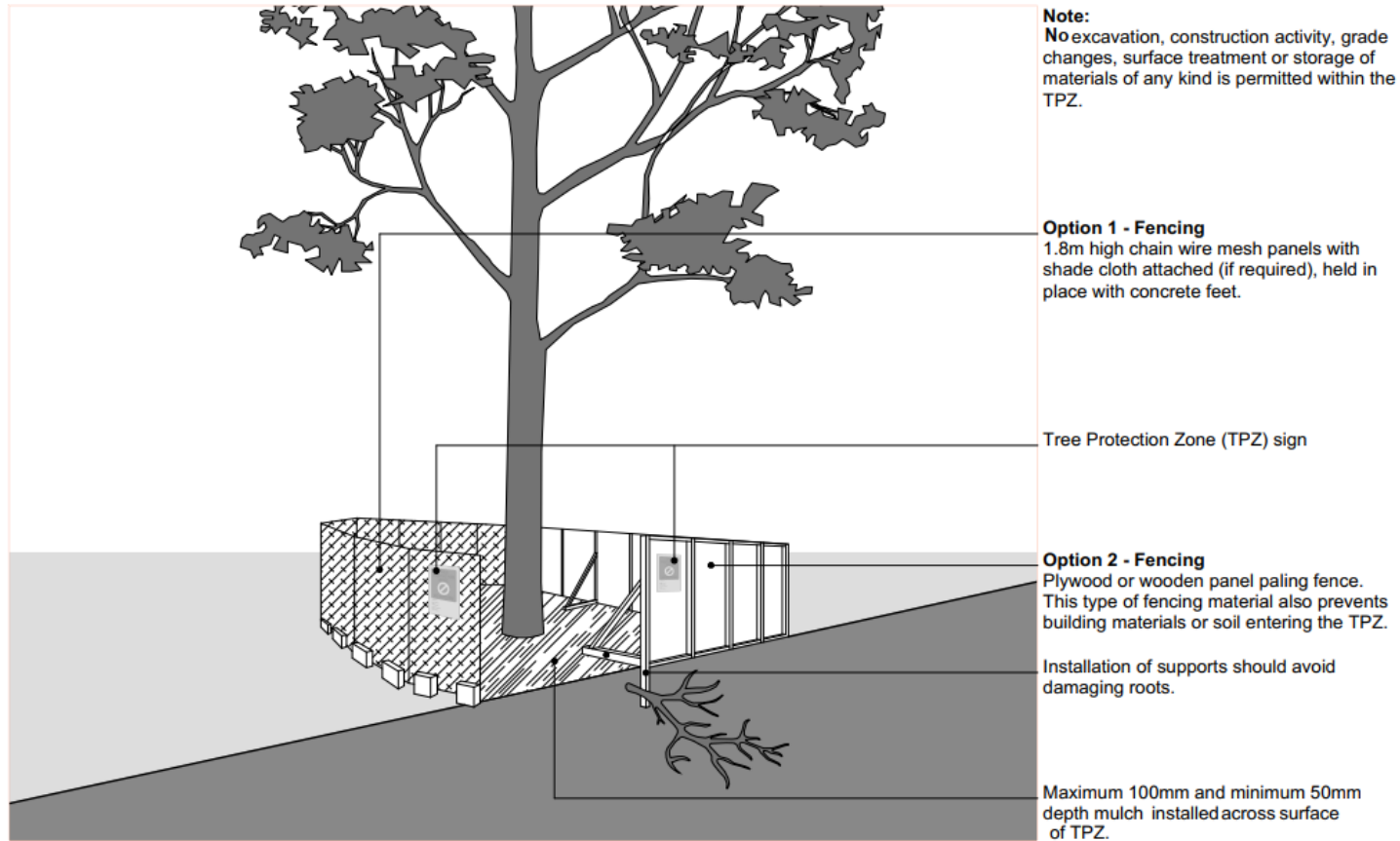




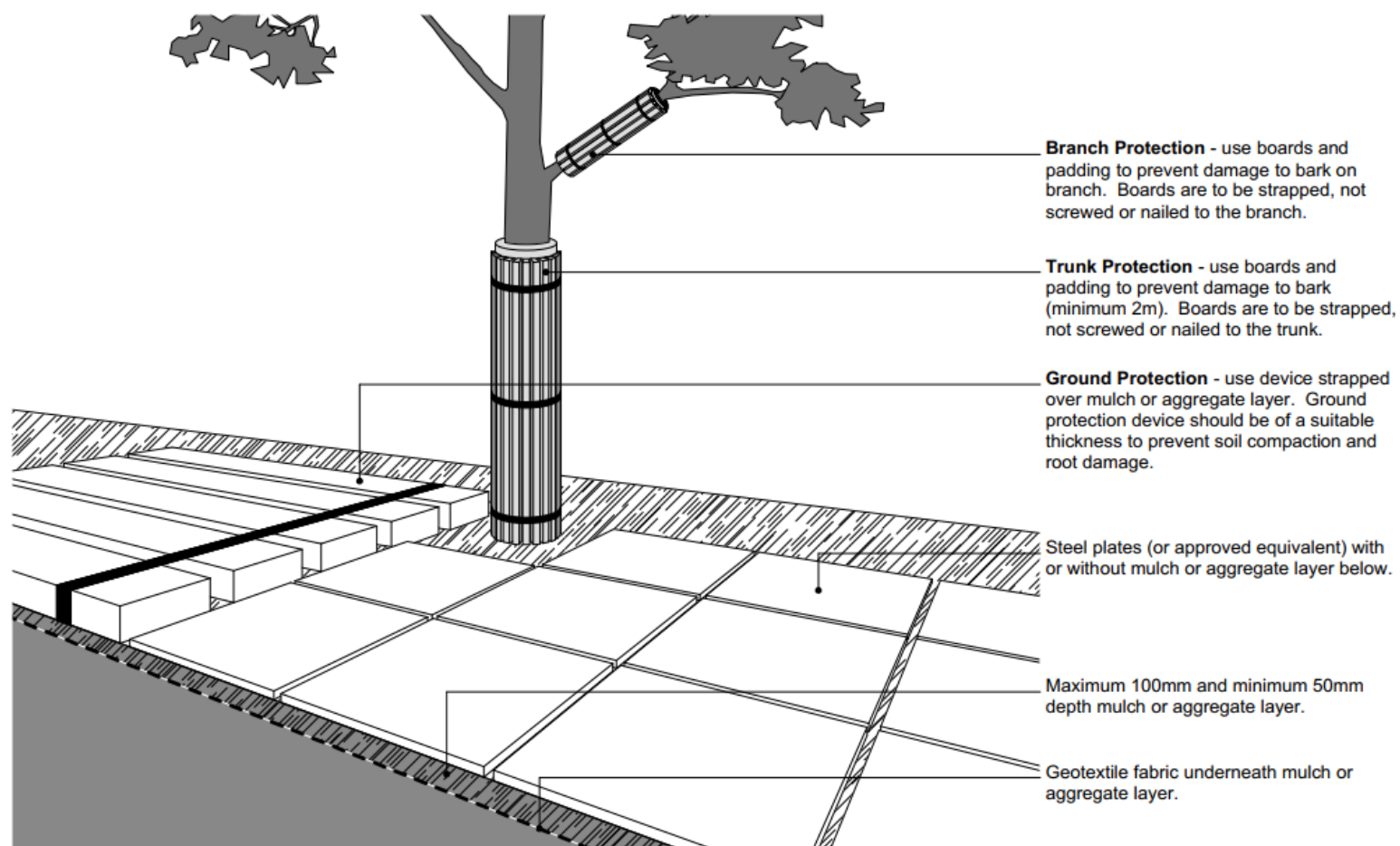
Figure 6. Trees 7 - 15

## APPENDIX E

### Examples of Trunk and Tree Protection Fencing

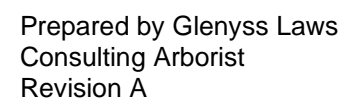


Tree Protection Fencing



Examples of Branch, Trunk and Ground Protection





APPENDIX G  
Tree Management Plan

