

Glenyss Laws
Consulting Arborist

Arboricultural Impact Assessment Report

Prepared for
Penrith City Council

Property
Regulus Street
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 sixteen individual trees and four groups of closely planted trees within Regulus Street, Erskine Park.
- 1.2 The aim is to determine the tree's landscape significance, condition and vigour and provide appropriate development setbacks in accordance with AS4970-2009 whilst considering relevant tree and vegetation legislation.
- 1.3 The proposal entails subdivision of the reserve to create five residential allotments.
- 1.4 The proposed subdivision and potential building footprints will require the removal of thirteen trees including one tree of high retention value and twelve trees of low retention value. Given adequate setbacks and well-considered architectural design, it is feasible to retain eight trees assessed as less critical for retention and six specimens associated with the cluster of trees identified as Tree 20.

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. Due to site restrictions Diameter at Breast Height (DBH) and Diameter Above Root Buttress (DRB) were estimated.
- 2.6 The comments and recommendations in this report are based on findings from a site inspection on 2 November 2021.
- 2.7 A list of literature used in the preparation of this report is provided in the bibliography section.
- 2.8 Plans sighted in the preparation of the report include:
 - Plan of Detail and Levels dated 9/7/20 Version B by Richard Hogan and Company.
 - Engineering Plans Sheet No DA601 Issue A dated 20/12/21 by J Wyndham Prince

3 Observations

3.1 The Site

- 3.1.1 The property is public reserve identified as Lot 3280, DP 786811, known as 73 Swallow Drive, Erskine Park. The reserve is located on the corner of Regulus St and Swallow Drive and is bounded by residential properties to the east and south (refer Figure 1).



Figure 1. Location Regulus Street, Erskine Park (Source 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) are attached in Appendix A.
- 3.2.2 The reserve was subject to a site inspection and Preliminary Assessment Report in 2015. Numerous trees have been removed since the 2015 inspection, subsequently the trees have been renumbered.

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.

Regulus Street, Erskine Park

- 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 property does not fall within a Heritage Conservation Area nor is the property listed as an item of heritage under Sheet HER 020 of LEP 2010.
- 4.1.3 The property is not identified as being of sensitive land within Council's LEP 2010 Natural Resources Sensitivity Land Map, Sheet NRL 020 nor is the property zoned E2 Environmental Conservation under LEP 2010.
- 4.1.4 The property is not identified as being of biodiversity significance within the NSW Department of Planning, Industry and Environment Biodiversity Values Map (refer Figure 2).

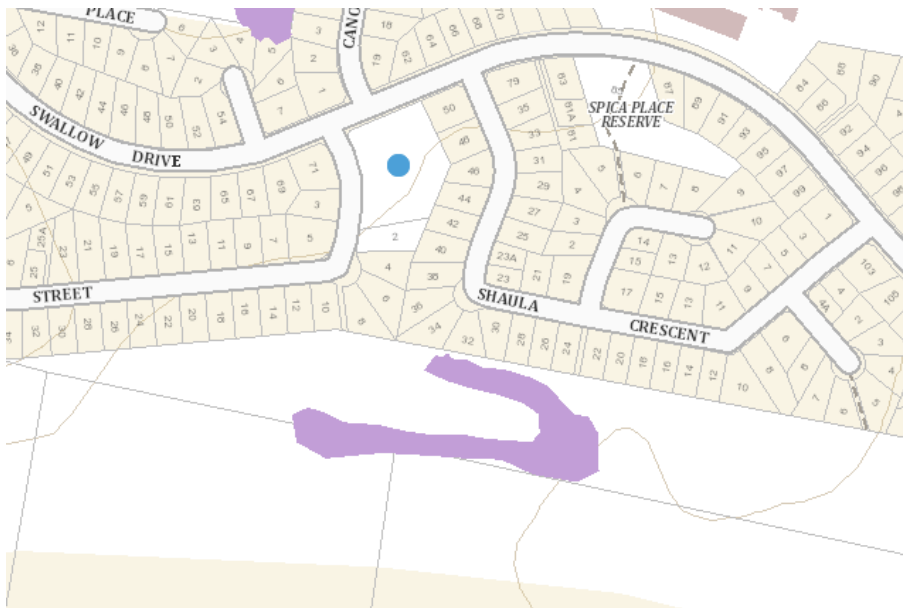


Figure 2. NSW Biodiversity Map (Source NSW Department of Planning Industry & Environment <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap> accessed 22/11/21).

- 4.1.5 Applying the above criteria all trees are protected under the terms of Penrith City Council's Tree Management Controls.

4.2 Tree Retention Value and Landscape Significance

- 4.2.1 A tree's significance and retention value can be determined 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.

Tree 1 falls in this category.

- 4.2.3 Trees of high landscape significance with a short ULE should not be given importance for preservation, as these trees are considered to be short term prospects and are best replaced with advanced stock grown to Australian Standards.

Trees 2, 3, 4, 5, 6, 7, 8 & 9 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 12, 13, 14, 15, 16, 17, 18 & 19 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 may be considered for removal.

The cluster of specimens identified as Trees 10, 11, 20 & 21 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.

- 4.3.6 Tree sensitive construction should be considered if a major encroachment of the TPZ is contemplated.

Tree No	DBH (cm)	DRB (cm)	TPZ Radius (m)	TPZ Area (m ²)	SRZ Radius (m)
1	127	136	15.0	707	3.8
2	71	86	8.5	228	3.2
3	55	66	6.6	137	2.8
4	66	78	7.9	197	3.0
5	64	84	7.7	185	3.1
6	86	98	10.3	335	3.3
7	58	64	7.0	152	2.8
8	63	73	7.6	180	2.9
9	68	85	8.2	209	3.1
10	19	23	2.3	16	1.8
11	20	28	2.4	18	2.0
12	36	45	4.3	59	2.4
13	38	49	4.6	65	2.5
14	24	32	2.9	26	2.1
15	27	33	3.2	33	2.1
16	33	41	4.0	49	2.3
17	35	42	4.2	55	2.3
18	22	26	2.6	22	1.9
19	38	42	4.6	65	2.3
20	30	38	3.6	41	2.3
21	24	28	2.9	26	2.0

Table 1. Tree Protection and Structural Root Zones

4.4 Potential Subdivision and Development impacts

4.4.1 Tree 1, considering the trees location within Lot 1, the specimen will fall within the footprint of any future dwelling.

4.4.2 Tree 2 an 8.5m TPZ applies, given the location of the tree within Lot 2, the proposed building footprint will constitute a major TPZ or SRZ encroachment.

4.4.3 Tree 3 is shown in the Engineering plans to be retained, works within the 6.6m TPZ include:

- Stormwater drainage lines offset ~4.4m

The proposal is a marginal TPZ encroachment of 11%. The specimen is in irreversible decline with a life expectancy of < 5 years and should not be retained if residential development is proposed.

4.4.4 Tree 4 is identified in the Engineering plans to be retained, works within the 7.9m include:

- Stormwater drainage lines offset ~5.2m

The proposal is a marginal encroachment of ~ 11.5% TPZ. The specimen is over mature and assessed with a short life expectancy. It would be prudent to remove and replace Tree 4 with a species that will achieve similar dimensions as part of the proposed development.

- 4.4.5 Trees 5, 6, 7, 8 & 9 will fall within the building or driveway footprint, or the potential impacts from the proposed dwellings will constitute a major TPZ/SRZ encroachment.
- 4.4.6 Trees 10 & 11 are two clumps of planted native species < 6.5m in height. The trees are of low retention value, their removal should not be seen as a constraint to the subdivision or architectural design.
- 4.4.7 Trees 12 – 19 are planted *Corymbia citriodora*, the species are native to the Queensland coast and tablelands. There is no encroachment of the TPZ associated with the stormwater drainage towards rear of Lots 4 & 5. Given adequate offsets and with well-considered architectural, hydraulics and landscape plan, it is feasible to retain Trees 12 – 19.
- 4.4.8 Tree 20 is a cluster of planted native species exhibiting fair to poor vitality. The three most northern specimens associated with Tree 20 is comprised of a dead specimen, a mature *Casuarina cunninghamiana* and associated suckering saplings (refer Figure 7). The 1 x dead specimen, 1 x most northern mature *Casuarina cunninghamiana* and suckering saplings are recommended for removal.
- 4.4.9 Tree 21 is a cluster of planted native species exhibiting fair vitality. The four most southern specimens (2 x *Casuarina cunninghamiana*, *Eucalyptus sp.* and *Callistemon viminalis*) will fall within the footprint or are offset < 2m to the stormwater drainage lines. The stability of these four trees will be compromised and are recommended for removal. The northern two trees associated with this group of trees are potentially impacted by future building footprints. The group of trees identified as Tree 21 are of low retention value and recommended for removal.

5 Conclusions/Recommendations

- 5.1 Sixteen individual trees and four clusters of trees were assessed. The proposal seeks to subdivide the reserve to create five residential allotments.
- 5.2 The proposed subdivision and potential building footprints will require the removal of thirteen (13) trees. This includes one (1) high retention value tree and twelve (12) trees of low retention value.

High Retention	Less Critical for Retention	Low Retention
1	-	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 21 & 3 x 20 (the most northern 3 trees identified as a <i>Casuarina cunninghamiana</i> and associated sucker growth and the dead tree refer Figure 7)

Table 2. Potential impacts and tree removal.

- 5.3 Given adequate building setbacks and well-considered architectural design it is feasible to retain eight (8) trees less critical for retention and six (6) trees associated with Tree 20.

High Retention	Less Critical for Retention	Low Retention
-	12, 13, 14, 15, 16, 17, 18 & 19	6 x 20 (except the most northern 3 trees)

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

- 5.4 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 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
Tree Protection	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
Machinery Access	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
Earth Works	The Site Arborist to monitor any earthworks within the TPZ's. Note these works must be undertaken by hand or with an air knife.	Inspected, documented & certified by Project Arborist
Practical Completion	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 Tree Protection shall consist of a 1.8m high chain link temporary fencing erected at the distances nominated in Appendix F - Tree Protection Plan.

- 6.2.3 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.
- 6.2.4 Once erected, the TPF shall be regarded as sacrosanct and shall not be removed or altered without prior agreement of the project arborist.
- 6.2.5 Attention shall be given to ensuring the TPZ remains rigid and complete and excludes all construction activity and storage of materials.
- 6.2.6 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.
- 6.2.7 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 Soft and Hard Landscaping

6.6.1 Installation of soft or hard landscaping including paving, turf or plant material within the TPZ shall be undertaken by hand.

6.6.2 Planting holes are to be hand dug with a shovel or garden trowel.

6.7 Breach of tree protection

6.7.1 Any above or below ground damage (including soil compaction) to a protected tree shall be reported to the Project Arborist immediately.

6.7.2 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)
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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

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IACA (2010) IACA Significance of a Tree, Assessment Rating System (STARS). Institute of Australian Consulting Arboriculturists, Australia, 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 moluccana</i> (Grey Box)	O	1270	1360	20	18	3	D	1	2	Gr, C/-/-	Recent dead wood pruning undertaken.
2	<i>Eucalyptus moluccana</i> (Grey Box)	O	710	860	23	14	2	C	1	3	Gr, C/D, C/-	Decay in 2 nd order branch attachment at 12m. Cavity of possible habitat value at 3.5m.
3	<i>Eucalyptus moluccana</i> (Grey Box)	O	550	660	20	11	1	C	1	4	Gr, C/F/-	Past leader failure, specimen formed 6 leaders near point of leader failure in 2015 inspection. 3 leaders have since been pruned/removed. Decay in lower trunk. Contains hollows of possible habitat value.
4	<i>Eucalyptus moluccana</i> (Grey Box)	O	660	780	21	14	2	C	1	3	Gr, C/D/-	Canopy holds high volumes of epicormic shoots.
5	<i>Eucalyptus moluccana</i> (Grey Box)	O	640	840	23	10	2	C	1	3	Gr, C/-/-	Holds large volumes of deadwood < 150mm in diameter. 80% of canopy comprised of epicormic growth. Decay in basal area to south measures 20 x 80cm. Sounding with a mallet produced a good resonance.
6	<i>Eucalyptus moluccana</i> (Grey Box)	O	860	980	17	8	1	C	1	4	Gr, C/-/-	Recent leader failure at 10m. Contains hollows of possible habitat value.
7	<i>Eucalyptus moluccana</i> (Grey Box)	O	580	640	20	10	3	C	1	3	Gr, C/D/-	Decay in lower trunk at 80cm measures 45 x 10cm with excellent wound wood development.

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
8	<i>Eucalyptus moluccana</i> (Grey Box)	O	630	730	21	11	2	C	1	3	Gr, C/-/-	
9	<i>Eucalyptus moluccana</i> (Grey Box)	O	680	850	21	12	2	C	1	4	Gr, C/-/-	Decay in lower trunk to north measures 80cm x 17cm. Cavity of possible habitat value at point of bifurcation of leader at 12m. Canopy holds major volumes of deadwood 50 – 300mm in diameter. Decay at point of old 1 st order branch failure to north at 3m. Decay in basal area to west measures 30cm x 35cm
10	3 x <i>Casuarina cunninghamiana</i> (River She-Oak) 1 x <i>Grevillea robusta</i> (Silky Oak)	Y	190	230	3.5 – 6	2 – 3	4	C	2	5	Gr, C/-/-	Small group of 4 young, planted specimens.
11	2 x <i>Casuarina cunninghamiana</i> (River She-Oak) 1 x <i>Grevillea robusta</i> (Silky Oak) 1 x <i>Eucalyptus sp.</i> 1 x <i>Callistemon viminalis</i> (Bottle Brush)	S	200	280	3 – 6.5	4	4	I	2	5	Gr, C/-/-	Small group of 5 young, planted specimens.
12	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	360	450	16		4	C	2	2	Gr/-/-	
13	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	380	490	17		4	C	2	2	Gr/-/-	
14	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	240	320	9		4	C	2	2	Gr/-/-	

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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
15	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	270	330	12		4	C	2	2	Gr/-/-	
16	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	330	410	18		4	C	2	2	Gr/-/-	
17	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	350	420	18		4	C	2	2	Gr/-/-	
18	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	220	260	10		4	C	2	2	Gr/-/-	
19	<i>Corymbia citriodora</i> (Lemon-scented Gum)	S	380	420	10		4	C	2	2	Gr/-/-	
20	5 x <i>Casuarina cunninghamiana</i> (River She-Oak) 2 x <i>Melaleuca species</i> (Paperbark) 1 x <i>Eucalyptus species</i>	S	300	380	5 – 16	3-10	4	C	3	5	Gr, C/-/-	Group of 8 young to semi mature specimens planted between Trees 12 - 19.
21	<i>Corymbia citriodora</i> (Lemon-scented Gum) <i>Casuarina cunninghamiana</i> (River She-Oak) 3 x <i>Eucalyptus sp.</i> (Eucalypts) <i>Callistemon viminalis</i> (Bottle Brush)	S	240	280	Average 16	4	3	C	3	5	Gr, C/-/-	Group of 16 young to semi mature planted species

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	

Defects:

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

Services adjacent structures:

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)

1	Long ULE	Trees that appear to be retainable at the time of assessment for more than 40 years
2	Medium ULE	Trees that appear to be retainable at the time of assessment for more than 15-40 years
3	Short ULE	Trees that appear to be retainable at the time of assessment for more than 5-15 years
4	Remove	Trees that should be removed within the next 5 years
5	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					
<u>Legend for Matrix Assessment</u>						
	Priority for Retention (High) - 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.					
	Consider for Retention (Medium) - 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.					
	Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.					
	Priority for Removal - 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

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

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

APPENDIX D
Site Photographs



Figure 3. Tree 1 exhibits good condition and vigour



Figure 4. Tree 2 contains hollows of habitat value



Figure 5. Tree 10 leader failure and potential habitat value.



Figure 6. Trees 14 – 19 and 4 *Casuarina* sp. associated to Tree 20

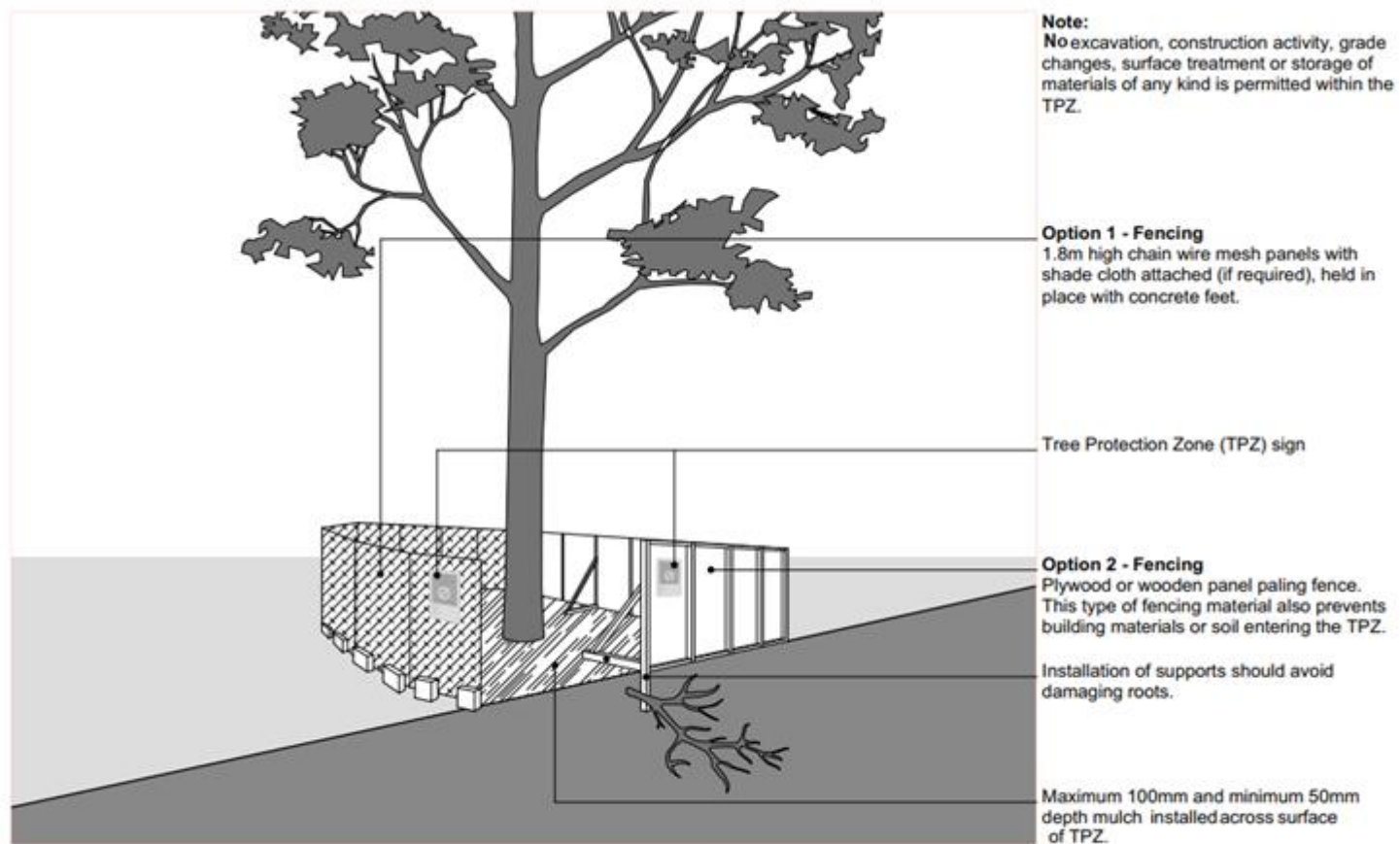


Figure 7. Northern section of cluster of low retention value specimens identified as T20 are recommended for removal.



Figure 8. Cluster of semi mature trees identified as Tree 21

APPENDIX E Example of Tree Protection Fencing



Tree Protection Fencing

APPENDIX F
Subdivision Plan, Tree Protection Zones and Tree Management Plan

