ARBORICULTURAL IMPACT ASSESSMENT

14 HAMILTON ROAD ALBION PARK NSW 2527

Prepared for LandTeam Australia Pty Ltd

CONSULTANT ARBORIST
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1.0 INTRODUCTION

This Arboricultural Impact Assessment has been requested by LandTeam Australia Pty Ltd for the proposed subdivision at 14 Hamilton Road, Albion Park NSW 2527.

This arboreal assessment examines trees located upon the existing site that may be affected by the proposed subdivision.

This report will address in the case of each tree:
- species identification, location, dimensions and health;
- amenity value and Safe Useful Life Expectancy (SULE) rating;
- the Sustainable Retention Index Value (SRIV);
- the potential impact of future site subdivision on the existing trees;
- recommendations for removal, retention and / or pruning; and
- tree protection zones.

The subject site is in Albion Park; therefore, Shellharbour City Council is the consenting authority for any tree works (where the tree fulfils the criteria of the local tree management policy) recommended within this report.

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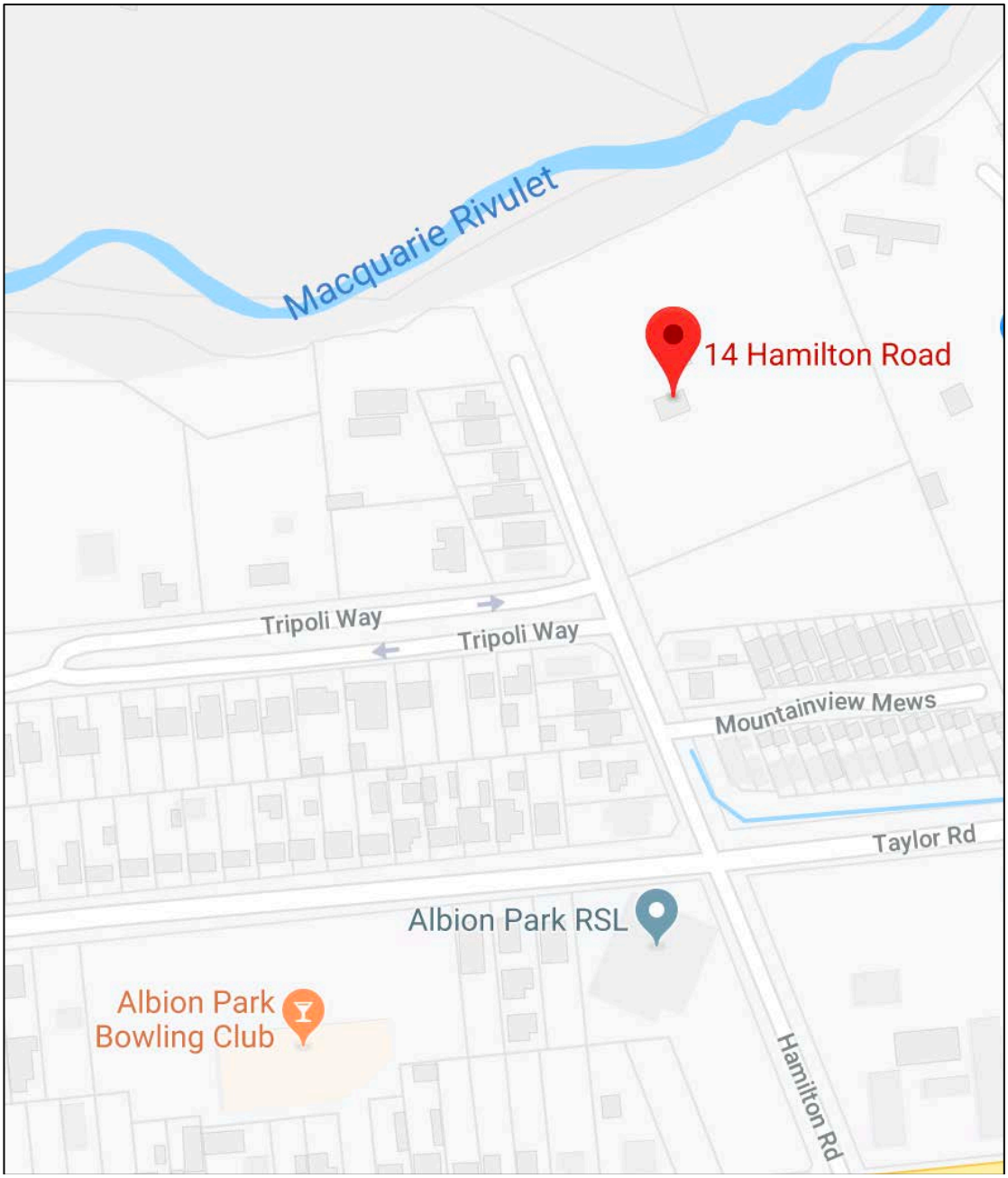
2.0 LOCATION OF TREES

PLAN 1 – LOCATION MAP OF SITE
14 Hamilton Road, Albion Park NSW 2527



Location map obtained from Google Maps 2019.
Do not scale from this plan.

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PLAN 2 – AERIAL PHOTOGRAPH OF SITE
14 Hamilton Road, Albion Park NSW 2527

Aerial Photograph obtained from Google Maps 2019.

The tree assessment site is the area located within the yellow lines.

Do not scale from this photograph.

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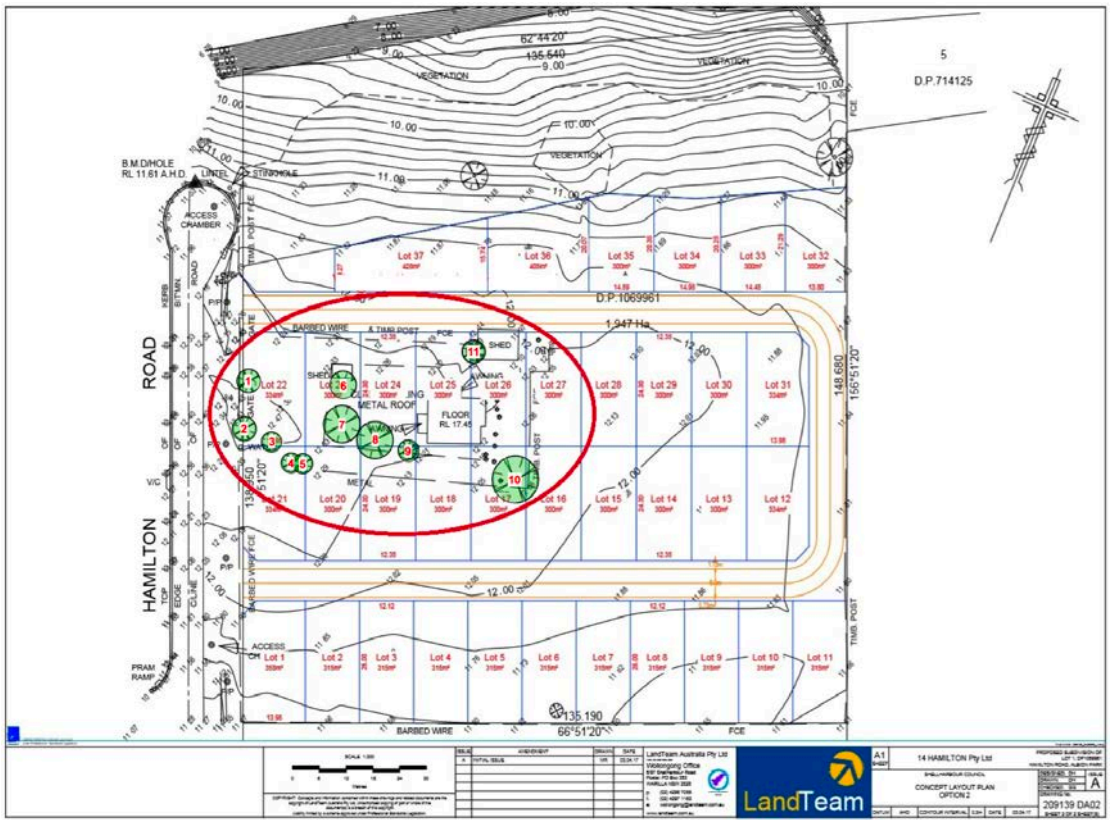
PLAN 3 – SITE MAP SHOWING EXISTING TREES AND PROPOSED SUBDIVISION

14 Hamilton Road, Albion Park NSW 2527



Map of proposed subdivision obtained from LandTeam Australia Pty Ltd.

Do not scale from this plan.

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3.0 DISCLOSURE STATEMENT

Trees are living organisms which possess natural variability. An arborist cannot guarantee that a tree will be safe under all circumstances, nor predict if or when a tree will fail. To live or work near a tree involves an element of risk, therefore, this tree evaluation does not preclude all of the possibilities of tree failure.

4.0 SCOPE OF WORK

Carry out visual ground-based examination of the nominated trees located within the residential site boundaries.

Inspect the nominated trees and their natural growing environment.

Provide an objective appraisal of the subject trees in relation to species, estimated age, health, structural condition and viability within the landscape.

Based on the findings of this inspection, provide independent recommendations on the retention or removal of the trees.

Identify and reduce potential conflicts between tree protection and future site subdivision by providing accurate information on the area required for tree protection and the restricted activities within the area for the tree prior to construction.

5.0 METHODOLOGY

The following tree assessment was conducted using criteria suggested by the International Society of Arboriculture.

- A Visual Tree Assessment (VTA) was carried out from ground level.

- Data collected from the Visual Tree Assessment including tree dimensions was compiled using a tape measure and binoculars. Tree height and width were estimated. No aerial or internal tree investigations were undertaken.

- Tree locations have been marked onto a plan that was obtained from LandTeam Australia Pty Ltd. The tree locations are shown on Plan 3 of this report.

- Tree data has been compiled in Table 1 of this report. This table comprises tree species, dimensions, condition and a brief assessment of the trees as referenced in Plan 3.

- The Safe Useful Life Expectancy (SULE) rating for each tree was determined using the Barrell 2001 format.

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- The vitality of tree health was estimated using the Sustainable Retention Index Value (SRIV) Version 4 that has been developed by the Institute of Australian Consulting Arborists 2010.

- Note that SULE and SRIV ratings can not predict the impact of extreme weather events on the subject trees; or detect internal defects within the tree trunk or root system.

- The Tree Protection Zone (TPZ) was calculated using the method specified in the Australian Standard AS4970-2009: Protection of trees on development sites. TPZ was calculated by multiplying the tree's Diameter at Breast Height (DBH) by twelve. TPZ radius = DBH x 12.

- Structural Root Zones (SRZ) were calculated using the calculation formula and graph supplied in the Australian Standard – AS4970-2009 '*Protection of Trees on Development Sites*'.

6.0 TREE SURVEY EXPLANATORY NOTES

Diameter at Breast Height (DBH): this is the trunk diameter in centimetres at 'breast height'. Breast height is recorded at 1.5m above ground level.

Deadwood: is expected to be present on mature trees. As the percentage of deadwood increases in the overall tree canopy the SULE rating will be downgraded. In some cases, deadwood may indicate a progressive limb dieback pattern or limb death caused by termites.

Height: Is a measure of vertical distance from ground level to the top of the tree crown. For palms, it is the measure to the apical growth point. Measurements are reported in metres.

Crown Spread: A two-dimension measurement in metres of the tree canopy. The first measurement is on the north-south orientation; the second measurement is for the east-west orientation.

Age: Is the estimate of the tree's age based on the expected life span of the tree. Age is reported as Young (Y), Mature (M) or Over-mature (O).

Young (Y)	Trees less than 20% of their life expectancy.
Mature (M)	Trees aged between 20% to 80% of their life expectancy.
Over-mature (O)	Trees over 80% of their life expectancy. Probably displaying signs of senescence.

Crown Aspect: this refers to the aspect the majority of the crown resides in. This will be either termed Symmetrical (Sym.) where the centre of the crown resides over the root crown, or the cardinal direction the centre of the crown is biased towards, being either North (N), South (S), East (E) or West (W).

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Crown Ratio: Refers to the density of the crown in comparison to an example of the same species and age with good health and vigour. The crown ratio is expressed in the following proportions of foliage when compared to a specimen of good vigor (being 100%).

F – Full 85% - 100%
P - Partial 40% - 85%
S - Sparse less than 40%

Crown Class: is the differing crown habits as influenced by the external variables within the surrounding environment. They are:

D – Dominant Crown is receiving uninterrupted light from above and sides, also known as emergent.

C – Codominant Crown is receiving light from above and one side of the crown.

I – Intermediate Crown is receiving light from above but not the sides of the crown.

S – Suppressed Crown has been shadowed by the surrounding elements and receives no light from above or sides.

F – Forest Characterised by an erect, straight stem with little stem taper and virtually no branching over the majority of the stem except for the top of the tree which has a small concentrated branch structure making up the crown.

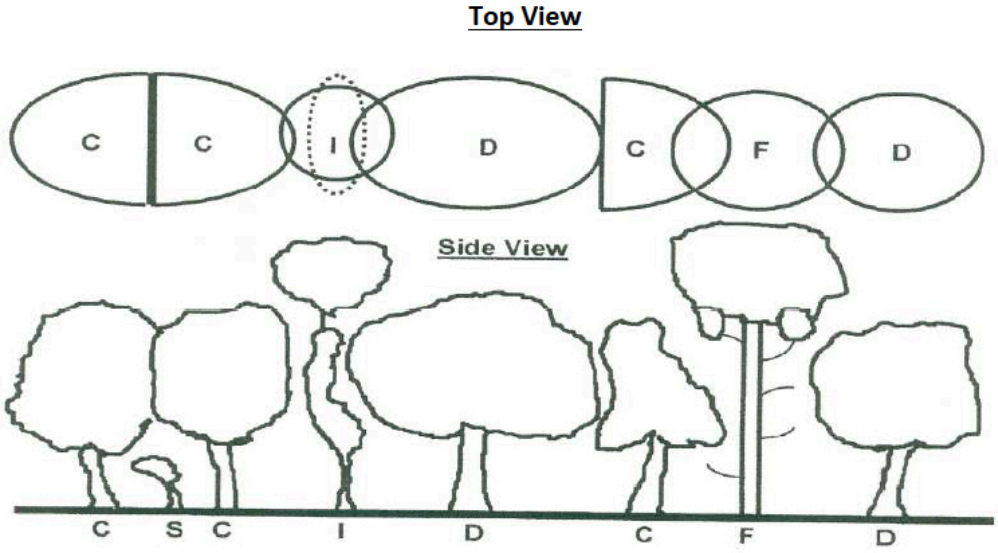

Figure 1 - Crown Class (Matheny, N. & Clark, J. R. 1998).

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Safe Useful Life Expectancy (SULE) rating: this tree rating system was developed by Barrell 2001. See detailed SULE rating explanatory notes in the Appendix section of this report.

Sustainable retention Index value (SRIV): a visual method of objectively rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria. Developed by the Institute of Consulting Arborists Australian 2010.

Tree Protection Zone (TPZ): is defined as a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown. It is the area required to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by construction and development activities.

SRZ: **The Structural Root Zone** (SRZ) is the area required for tree stability. The SRZ only needs to be calculated when major encroachment into a TPZ is proposed. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural and built structures, such as rocks and footings.

7.0 STANDARDS

All tree related work outlined in this report is to be carried out in accordance with Shellharbour City Council's Tree Management Policy or equivalent order.

All tree related work outlined in this report is to be conducted in accordance with:

- Australian Standard – AS4373-2007 '*Pruning of Amenity Trees*'.
- Australian Standard – AS4970-2009 '*Protection of Trees on Development Sites*'.
- SAFE WORK AUSTRALIA Code of Practice for Safe Acess for Tree Trimming and Arboriculture. 2011.
- SAFE WORK AUSTRALIA Guide to managing risks tree trimming and removal work. 2016.
- NSW WORKCOVER Code of Practice for the Amenity Tree Industry. August 1998; Catelogue No. 034.

All tree works must be carried out by a qualified arborist (minimum AQF Certificate II) who has had a minimum of 5 years' work experience as an arborist.

For any works undertaken near electrical lines, the arborist must be suitably accredited and follow the guidelines specified in the **WorkCover NSW Code of Practice – Work Near Overhead Power Lines (2006)**.

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All trees recommended for retention within this report must have as a minimum requirement: the removal of all dead, diseased, and crossing limbs; removal of branch stubs; and be pruned to the branch collar.

8.0 COMMENT ON TREE INSPECTIONS

Site Observations

The site at 14 Hamilton Road, Albion Park is a large rectangular semi-rural / residential lot. Land is relatively flat and fully grassed. The study area for this arboricultural report is concentrated within the immediate surrounds of the existing residential cottage. This is the location of the eleven trees that are the subject of this tree report.

Three trees on this property have been identified as exempt tree species (as listed by Shellharbour City Council). Many of the trees on this lot are aged and in poor general condition. All trees at this location have a low retention value.

The proposed subdivision, if approved, will create 37 new residential lots. Plan 3 on page 6 of this report shows the position of the proposed subdivision and the location of the trees that are the subject of this arboricultural impact assessment.

Individual Tree Observations

Tree 1 – *Jacaranda mimisifolia* (Jacaranda)

Height: 10m. Width: 10m. DBH: 50cm.

This fully mature Jacaranda displays fair health and vigour but has poor shape and structure. This is a multi-trunked tree that has an exposed root system. Suckering trunks and major branches are growing from the base of tree. There is included bark visible at the major trunk union. The tree has some dead wood and suckering 2nd order branches. Previous branch failures were noted at the time of inspection.

This tree been given a SULE rating of 3b and SRIV rating of MGVP-6. These low retention values are reflective of the current condition of this tree. This tree is suitable for short-term retention only.

This tree is located within Lot 22 of the proposed subdivision. Given the current condition of this tree and its short-term retention value, it is my suggestion that this tree is removed and replaced with a new tree in a suitable location.

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Tree 2 – *Nerium oleander* (Oleander)

Height: 4m. Width: 6m. DBH: multi-stemmed.

This large shrub displays fair health and vigour but has poor shape and structure. It is a multi-stemmed shrub that is overgrown and uncared for. This is an exempt tree species as listed by Shellharbour City Council. This shrub is suggested for removal.

The large shrub has been given a SULE rating of 3b and SRIV rating of MLVP-2. These low retention values support the suggested removal of this tree.

This shrub is located within Lot 22 of the proposed subdivision. Given the exempt species status of this shrub and its low retention value, this shrub should be removed and replaced with a more suitable tree species.

Tree 3 – *Brachychiton acerifolius* (Illawarra Flame Tree)

Height: 7m. Width: 6m. DBH: 28cm.

This mature tree displays fair shape and structure but has poor health and vigour. The tree is struggling from the recent extended period of dry weather. Crown development is poor (crown ratio 40%). The tree has some dead wood. A long-term tree care program wound need to be implemented if this tree was to be retained.

The tree has been given a SULE rating of 3d and SRIV rating of MLVF-4. These low retention values suggest that this tree is suitable for short-term retention only. Therefore, it does not appear to be a viable option to implement a long-term tree care program.

This tree is located within Lot 22 of the proposed subdivision. In my opinion this tree should be removed and replaced with a new tree at a suitable location within the proposed subdivision.

Tree 4 – *Jacaranda mimisifolia* (Jacaranda)

Height: 8m. Width: 7m. DBH: 28cm.

This mature tree displays poor health, vigour, shape and structure. The tree has a crown bias to the west due to crowded growing conditions. The tree has a bifurcated (twin) trunk with included bark at a height of 0.5m above existing ground level. The tree has small cavities and twisted, rubbing branches. There is dead wood within the crown and dieback of 2nd and 3rd order branches. This tree is suggested for removal.

The tree has been given a SULE rating of 4e and SRIV rating of MLVP-2. These low tree retention values support the suggested removal of this tree.

This tree is located in Lot 21 of the proposed subdivision. In my opinion this tree should be removed and replaced with a new tree at a suitable location within the proposed subdivision.

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Tree 5 – *Brachychiton acerifolius* (Illawarra Flame Tree)

Height: 8m. Width: 5m. DBH: 30cm.

This mature tree displays fair health, vigour, shape and structure. The tree has a crown bias to the east due to crowded growing conditions. This tree appears to be drought affected. The crown ratio is 40%. The health of tree could be improved with implementation of long-term tree care program.

The tree has been given a SULE rating of 3d and SRIV rating of MLVF-4. These low retention values suggest that this tree is suitable for short-term retention only. Therefore, it does not appear to be a viable option to implement a long-term tree care program for this tree.

This tree is located in Lot 21 of the proposed subdivision. Given that this tree is only suitable for short-term retention, it is my opinion this tree should be removed and replaced with a new tree at a suitable location within the proposed subdivision.

Tree 6 – *Brachychiton acerifolius* (Illawarra Flame Tree)

Height: 10m. Width: 5m. DBH: 48cm.

This is an over-mature tree that displays poor health, vigour, shape and structure. The tree crown has sparse foliage (crown ratio is less than 15%). There are significant bark inclusions at the major trunk and branch unions throughout the tree. This tree has potential for major limb failure and is nearing death. It is suggested for removal.

This tree has been given a SULE rating of 4a and SRIV rating of OLVP-0. These low tree retention ratings support the suggested removal of this tree.

This tree is located in the middle of Lot 23 of the proposed subdivision. This tree should be removed and replaced with a new tree at a suitable location within the proposed subdivision.

Tree 7 – *Brachychiton acerifolius* (Illawarra Flame Tree)

Height: 10m. Width: 5m. DBH: 39cm.

This is an over-mature tree that displays poor health, vigour, shape and structure. The tree crown has sparse foliage (crown ratio is less than 15%). This tree has a triple-trunk at a height of 4m above existing ground level. Previous branch failures were noted at the time of tree inspection. Similar to Tree 6, this tree is nearing death. It is suggested for removal.

This tree has been given a SULE rating of 4a and SRIV rating of OLVP-0. These low tree retention ratings support the suggested removal of this tree.

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This tree is located within Lot 23 of the proposed subdivision. This tree should be removed and replaced with a new tree at a suitable location within the proposed subdivision.

Tree 8 – *Alphitonia excelsa* (Red Ash)

Height: 10m. Width: 8m. DBH: 35cm.

This is an over-mature tree that displays poor health and vigour. Shape and structure are best described as fair. There is a history of previous branch failures. Dieback of branches in the lower half of crown is clearly visible. Foliage within the tree crown is sparse (crown ratio is less that 20%). Similar to Trees 6 & 7, this tree is nearing death. It is suggested for removal.

This tree has been given a SULE rating of 4a and SRIV rating of OLVF-2. These low tree retention values support the suggested removal of this tree.

This tree is located within Lot 24 of the proposed subdivision. This tree should be removed and replaced with a new tree at a suitable location within the proposed subdivision.

Tree 9 – *Syagrus romanzoffiana* (Queen or Cocos Palm)

Height: 4m. Width: 1.5m. DBH: 14cm.

This palm tree displays good health, vigour, shape and structure. The palm tree had no visible defects at the time of inspection. This tree is listed by Shellharbour City Council as an exempt tree species. It should be considered for removal.

This tree has been given a SULE rating of 2b and SRIV rating of MGVG-10. These high tree retention ratings reflect the current condition of this tree. They do not reflect the exempt status of this tree.

This tree is located within Lot 24 of the proposed subdivision. If this tree is removed, then it should be replaced with a new tree at a suitable location within the proposed subdivision.

Tree 10 – *Cinnamomum camphora* (Camphor Laurel)

Height: 12m. Width: 12m. DBH: 67cm.

This over-mature tree displays poor health, vigour, shape and structure. This tree is an exempt species that is clearly in decline. There is major dieback of branches and a history of multiple branch failures. It has a bifurcated trunk at a height of 0.5m above existing ground level. This tree is potentially dangerous. This tree is suggested for removal.

This tree has been given a SULE rating of 4a and SRIV rating of OLVP-0. These low tree retention ratings support the suggested removal of this tree.

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This tree is located within Lot 17 of the proposed subdivision. If this tree is removed, then it should be replaced with a new tree at a suitable location within the proposed subdivision.

Tree 11 – *Callistemon salignus* (Crimson Bottlebrush)

Height: 5m. Width: 5m. DBH: 20cm.

This over-mature tree displays poor health, vigour, shape and structure. This is a twin-trunked tree that is aged and in poor condition. There is included bark at the major trunk union and recent branch failure. In my opinion, this tree is beyond remediation. Therefore, it is suggested for removal.

This tree has been given a SULE rating of 4a and SRIV rating of OLVP-0. These low tree retention ratings reflect the current condition of this tree.

This tree is located on the proposed boundary that separates Lots 25 & 26 of the proposed subdivision. If this tree is removed, then it should be replaced with a new tree at a suitable location within the proposed subdivision.

The development proposal

If approved as currently planned, the proposed subdivision will create 37 new residential lots. A new U-shaped roadway will link these residential lots to Hamilton Road. Plan 3 of page 6 of this report shows the proposed subdivision layout and the location of the new roadway.

The existing trees that are the subject of this arboricultural impact assessment are all low value trees. Three of the existing trees are listed by Shellharbour City Council as exempt tree species. Given the overall poor condition of these trees and their low tree retention values, I am suggesting that all of these trees should be removed and replaced with new trees in the proposed subdivision.

Trees to be retained

None of the existing trees that are located within the study area are suggested for retention.

Trees to be removed

Trees Numbered **1, 2, 3, 4, 5, 6, 7, 8, 9, 10 & 11** are suggested for removal.

Trees Numbered 2, 9 & 10 are listed by Shellharbour City Council as exempt tree species. These trees may be removed regardless of the outcome of this development proposal. All remaining trees have low retention values.

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Compensatory planting

Compensatory planting will be required to offset the proposed tree loss. There appears to be an opportunity to plant 20 or more new street trees within the proposed subdivision.

I suggest that a minimum of 20 x 100 litre pot size trees are planted as compensatory planting at the time of future site development. These trees should be included in any future landscape design that will form part of the subdivision proposal.

Preference should be given to planting local Illawarra tree species in the new landscape.

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9.0 TREE ASSESSMENT DATA

Tree #	Botanic Name			Common Name			Age Class
1	Jacaranda mimisifolia			Jacaranda			M
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
10	10	50 multi-trunk	D	SYM	P 80%	3b	MGVP-6
Fair health and vigour. Poor shape and structure. Multi-trunked trees. Suckering trunks / major branches growing from base of tree. Included bark at major trunk union. Some dead wood. Suckering 2nd order branches. Previous branch failures. Exposed root system. Low retention value.						TPZ 6.0	SRZ 2.5

Tree #	Botanic Name			Common Name			Age Class
2	Nerium oleander			Oleander			M
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
4	6	multi-stem	D	SYM	P 80%	3b	MLVP-2
Fair health and vigour. Poor shape and structure. Multi-stemmed large shrub. Overgrown and uncared for. Undesirable species. Poor position on the lot. Low retention value. Suggest removal.						TPZ 3.6	SRZ 2.0

Tree #	Botanic Name			Common Name			Age Class
3	Brachychiton acerifolius			Illawarra Flame Tree			M
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
7	6	28	D	SYM	P 40%	3d	MLVF-4
Poor health and vigour. Fair shape and structure. Tree is struggling from extended period of dry weather. Poor crown ratio. Some dead wood. Long-term care required if tree was to be retained. Low retention value. Consider removal.						TPZ 3.4	SRZ 2.0

Tree #	Botanic Name			Common Name			Age Class
4	Jacaranda mimisifolia			Jacaranda			M
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
8	7	28 twin-trunk	C	WEST	P 40%	4e	MLVP-2
Poor health, vigour, shape and structure. Crown bias to the west due to crowded growing conditions. Bifurcated (twin) trunk with included bark at trunk union @ 0.5m. Small cavities. Twisted, rubbing branches. Dead wood and dieback of 2nd and 3rd order branches. Low retention value. Suggest removal.						TPZ 3.4	SRZ 2.0

Tree #	Botanic Name			Common Name			Age Class
5	Brachychiton acerifolius			Illawarra Flame Tree			M
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
8	5	30	C	EAST	P 40%	3d	MLVF-4
Fair health, vigour, shape and structure. Crown bias to the east due to crowded growing conditions. Tree appears to be drought affected. Crown ratio is 40%. Health of tree could be improved with long-term tree care program. Low retention value. Consider removal.						TPZ 3.6	SRZ 2.0

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Tree #	Botanic Name			Common Name			Age Class
6	Brachychiton acerifolius			Illawarra Flame Tree			O
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
10	5	48	D	SYM	S < 15%	4a	OLVP-0
Over-mature tree with poor health, vigour, shape and structure. Sparse foliage (crown ratio is less than 15%). Major bark inclusions at major trunk and branch unions throughout tree. Potential for major limb failure. Low retention value. Tree is nearing death. Suggest removal.						TPZ	SRZ
						5.8	2.5

Tree #	Botanic Name			Common Name			Age Class
7	Brachychiton acerifolius			Illawarra Flame Tree			O
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
10	5	39	D	SYM	S < 15%	4a	OLVP-0
Over-mature tree with poor health, vigour, shape and structure. Sparse foliage (crown ratio is less than 15%). Triple trunk @4m. Previous branch failures. Low retention value. Tree is nearing death. Suggest removal.						TPZ	SRZ
						4.7	2.3

Tree #	Botanic Name			Common Name			Age Class
8	Alphitonia excelsa			Red Ash			O
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
10	8	35	D	SYM	S < 20%	4a	OLVF-2
Over-mature tree that displays poor health and vigour. Fair shape and structure. Previous branch failures. Dieback of branches in lower half of crown. Low retention value. Tree is nearing death. Suggest removal.						TPZ	SRZ
						4.2	2.3

Tree #	Botanic Name			Common Name			Age Class
9	Syagrus romanzoffiana			Queen or Cocos Palm			M
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
12	4	30	D	SYM	F	2b	MGVG-10
Palm tree that displays good health, vigour, shape and structure. No visible defects. Exempt species. Low retention value. Consider removal.						TPZ	SRZ
						3.6	2.0

Tree #	Botanic Name			Common Name			Age Class
10	Cinnamomum camphora			Camphor Laurel			O
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
12	12	67 twin-trunk	D	SYM	S < 15%	4a	OLVP-0
Aged tree that displays poor health, vigour, shape and structure. Major dieback of branches. Multiple branch failures. Tree is in decline. Bifurcated trunk @ 0.5m. Tree is potentially dangerous. Low retention value. Suggest removal.						TPZ	SRZ
						8.0	2.9

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Tree #	Botanic Name			Common Name			Age Class
11	Callistemon citrinus			Crimson Bottlebrush			O
Height (m)	Spread (m)	DBH (cm)	Crown Class	Crown Aspect	Crown Ratio	SULE Rating	SRIV Rating
5	5	20 twin-trunk	D	SYM	S 30%	4a	OLVP-2
Aged tree that displays poor health, vigour, shape and structure. Twin-trunked tree with included bark at trunk union. Recent branch failure. Tree is beyond remediation. Low retention value. Suggest removal.						TPZ	SRZ
						2.4	1.9

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10.0 PHOTOGRAPHS

Photos 1 & 2 – Tree 1 – *Jacaranda mimisifolia* (Jacaranda)

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Photos 3 & 4 – Tree 2 – *Nerium oleander* (Oleander)

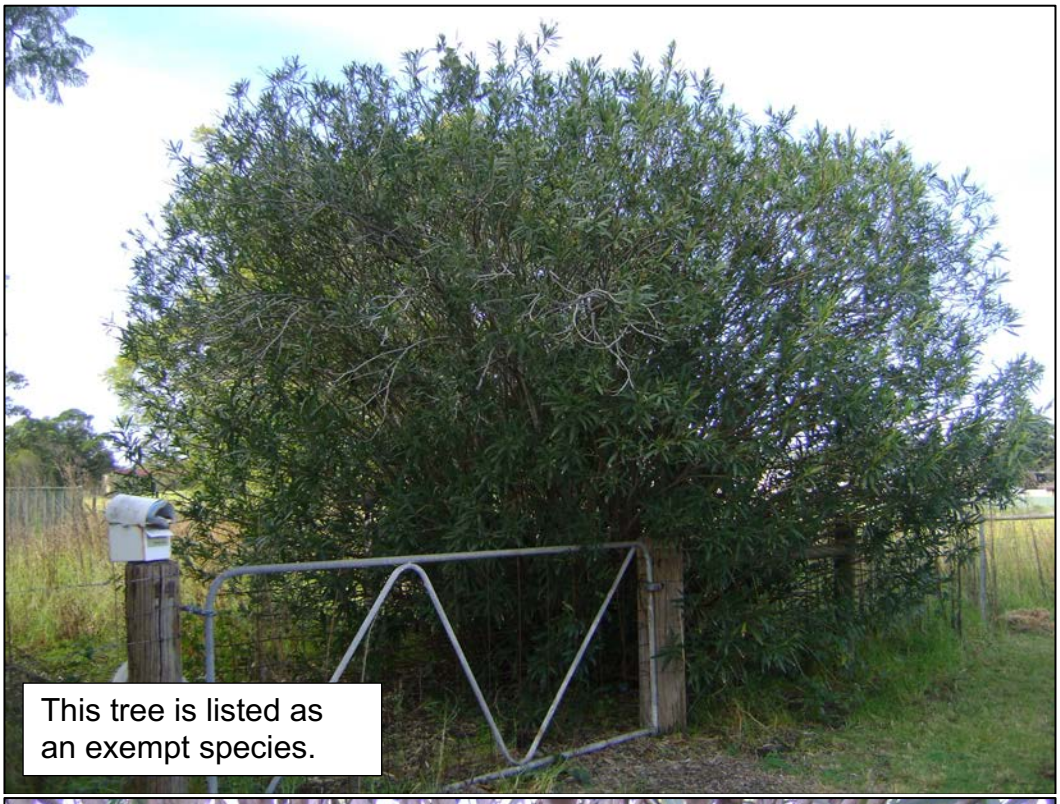

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Photo 5 – Tree 3 – *Brachychiton acerifolius* (Illawarra Flame Tree)

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Photo 6 – Tree 4 – *Jacaranda mimisifolia* (Jacaranda)

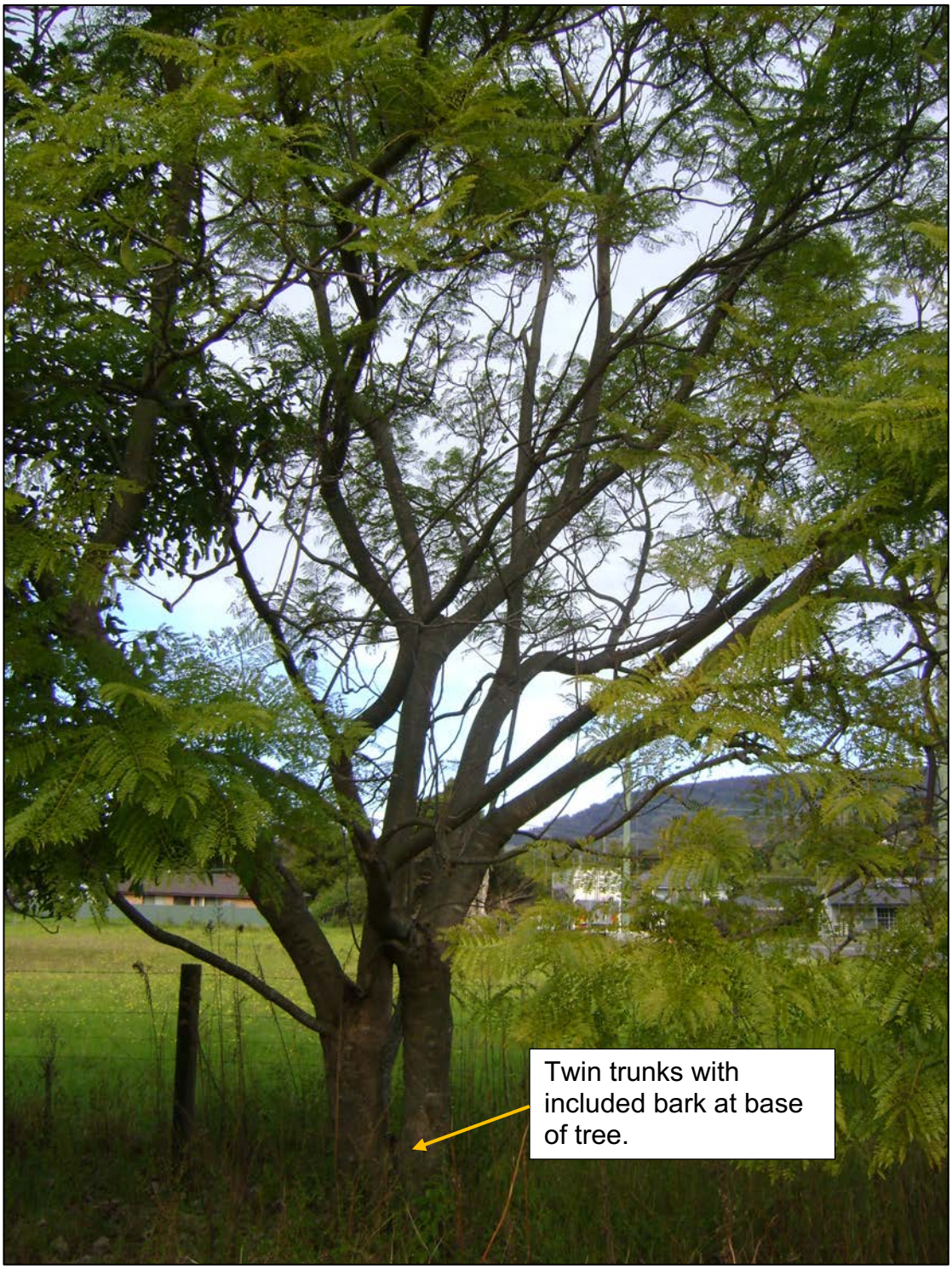

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Photo 7 – Tree 4 – *Jacaranda mimisifolia* (Jacaranda)

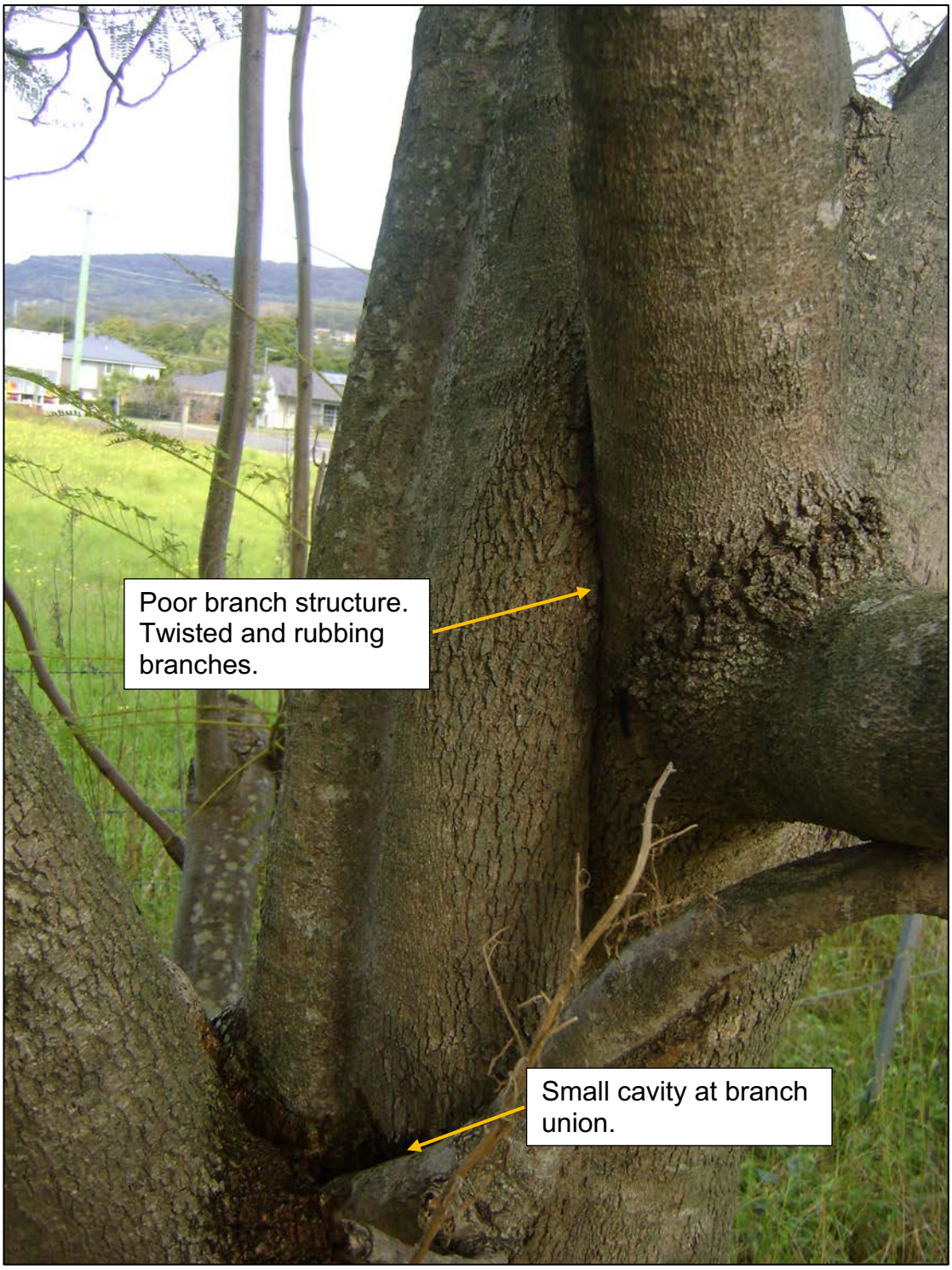

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Photo 8 – Tree 5 – *Brachychiton acerifolius* (Illawarra Flame Tree)

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Photo 9 – Tree 6 – *Brachychiton acerifolius* (Illawarra Flame Tree)

Note: Sparse crown development. This aged tree is in decline.

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Photo 10 – Tree 6 – *Brachychiton acerifolius* (Illawarra Flame Tree)

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Photo 11 – Tree 7 – *Brachychiton acerifolius* (Illawarra Flame Tree)

Note: Sparse crown development. This aged tree is in decline.

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Photo 12 – Tree 7 – *Brachychiton acerifolius* (Illawarra Flame Tree)

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Photo 13 – Tree 8 – *Alphitonia excelsa* (Red Ash)

Note: Sparse crown development. This aged tree is in decline.

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Photo 14 – Tree 9 – *Syagrus romanzoffiana* (Queen or Cocos Palm)

Note: This tree is listed as an exempt species.

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Photo 15 – Tree 10 – *Cinnamomum camphora* (Camphor Laurel)

Note: This tree is listed as an exempt species.

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Photo 16 – Tree 10 – *Cinnamomum camphora* (Camphor Laurel)

Note: This tree is listed as an exempt species.

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Photo 17 – Tree 11 – *Callistemon salignus* (Crimson Bottlebrush)

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11.0 APPENDIX

11.1 SAFE USEFUL LIFE EXPECTANCY – SULE (Barrell 2001)

	1. LONG	2. MEDIUM	3. SHORT	4. REMOVAL	5. MOVED OR REPLACED
	Trees that appeared to be retainable at the time of assessment for more than 40 years with and acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 - 40 years with and acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 - 40 years with and acceptable level of risk.	Trees that should be removed within the next 5 years.	Small, young or regularly pruned trees that can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 years.	Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.	Trees that could live for more than15 years but may be removed for safety or nuisance reasons.	Dangerous trees because of instability or recent loss of adjacent trees.	Young trees less than 5 years old but over 5m in height.
C	Trees of special significance for historical, commercial or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	Dangerous trees because of structural defects including cavities, decay, included bark, wounds, poor form.	Formal hedges and trees intended for regular pruning to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial care and are only suitable for retention in the short term.	Dangerous trees that are clearly not safe to retain.	
E				Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	
G				Trees that will become dangerous after the removal of other trees for the reasons given in a) to f).	
H				Trees in categories a) to g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.	

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11.2 SUSTAINABLE RETENTION INDEX VALUE (SRIV)
(IACA. 2010)

INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS
Managing Urban Trees®

Sustainable Retention Index Value (SRIV)© 2010
Version 4

Matrix - Sustainable Retention Index Value (SRIV)©

Use of this document and referencing

The Sustainable Retention Index Value (SRIV)© is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *Sustainable Retention Index Value (SRIV)*, Version 4, A visual method of objectively rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au .

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition.
An index value is given to each category where ten (10) is the highest value.

Age Class	Vigour Class and Condition Class					
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental conditions.
(Y) Young	**YGVG - 9** **Index Value 9** Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.	**YGVF - 8** **Index Value 8** Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.	**YGVP - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVG - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.	**YLVF - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVP - 1** **Index Value 1** Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability.
(M) Mature	**MGVG - 10** **Index Value 10** Retention potential - Medium - Long Term.	**MGVF - 9** **Index Value 9** Retention potential - Medium Term. Potential for longer with improved growing conditions.	**MGVP - 6** **Index Value 6** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVG - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVF - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVP - 2** **Index Value 2** Retention potential - Likely to be removed immediately or retained for Short Term.
(O) Over-mature	**OGVG - 6** **Index Value 6** Retention potential - Medium - Long Term.	**OGVF - 5** **Index Value 5** Retention potential - Medium Term.	**OGVP - 4** **Index Value 4** Retention potential - Short Term.	**OLVG - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions.	**OLVF - 2** **Index Value 2** Retention potential - Short Term.	**OLVP - 0** **Index Value 0** Retention potential - Likely to be removed immediately or retained for Short Term.

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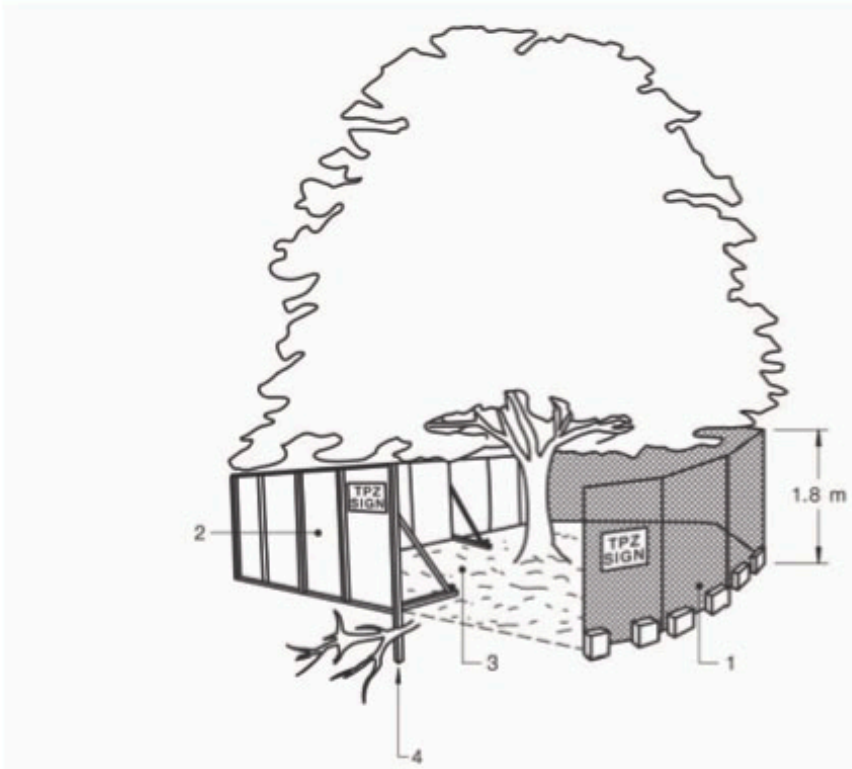
11.3 TREE PRESERVATION ZONE (TPZ) FENCING GUIDELINES



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.

Source: AS 4970 : 2009

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11.4 TREE PRESERVATION ZONE (TPZ) SIGN GUIDELINES

TPZ Signs should be placed on TPZ fence so they are clearly visible from all areas of the work zone.

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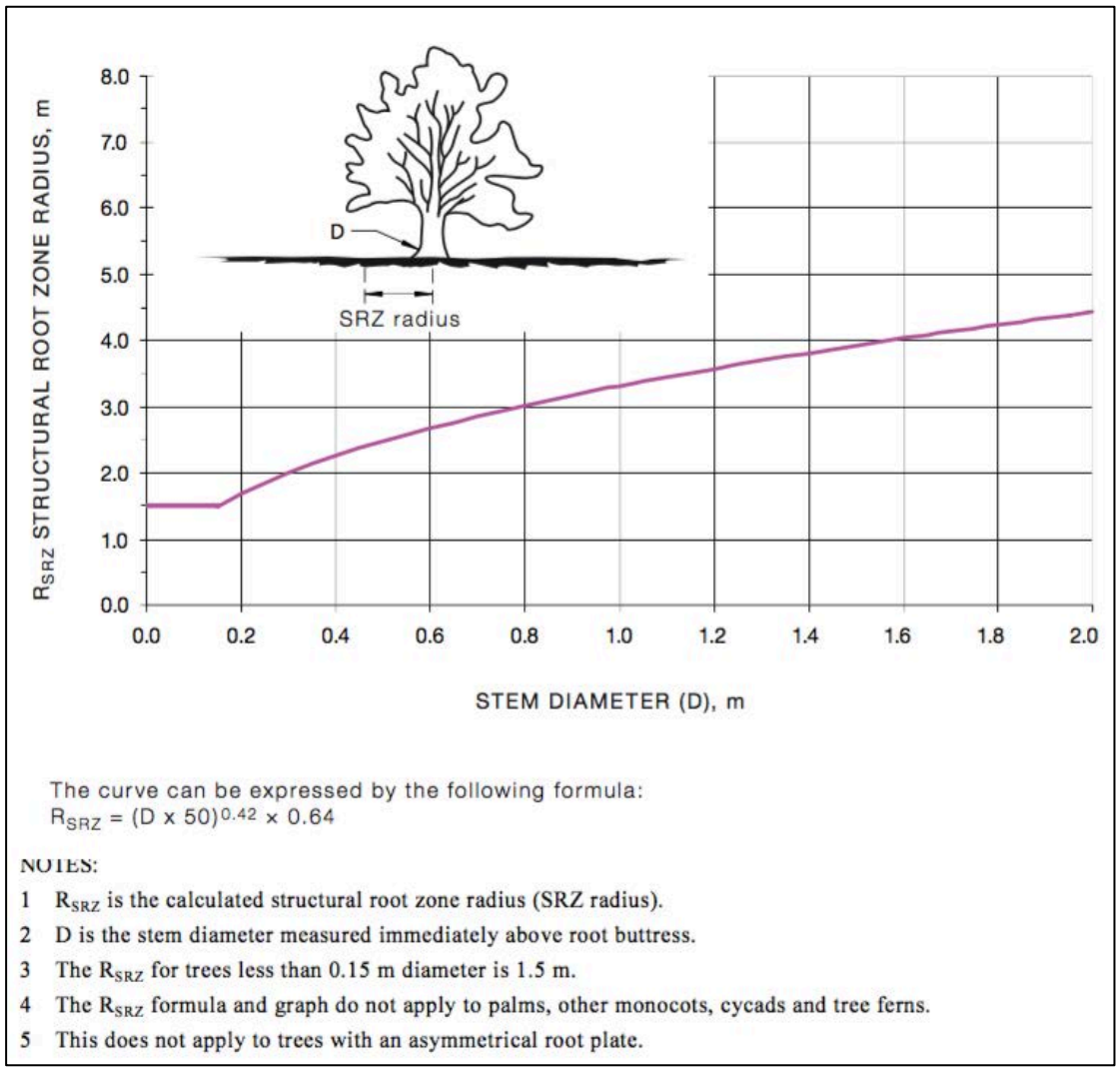
11.5 STRUCTURAL ROOT ZONE(SRZ) CALCULATION



The curve can be expressed by the following formula:
$R_{SRZ} = (D \times 50)^{0.42} \times 0.64$

NOTES:

1 R_{SRZ} is the calculated structural root zone radius (SRZ radius).
2 D is the stem diameter measured immediately above root buttress.
3 The R_{SRZ} for trees less than 0.15 m diameter is 1.5 m.
4 The R_{SRZ} formula and graph do not apply to palms, other monocots, cycads and tree ferns.
5 This does not apply to trees with an asymmetrical root plate.

Source: Australian Standard – AS4970-2009 '*Protection of Trees on Development Sites*'.

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12.0 BIBLIOGRAPHY

Australian Standard – AS4373-2007 '*Pruning of Amenity Trees*'.

Australian Standard – AS4970-2009 '*Protection of Trees on Development Sites*'.

Barrell. J. 2001. SULE: Its use and status into the new millenium. Paper presented at NAAA Conference. Sydney.

Fairley. A. & Moore. P. 2010. Native Plants of the Sydney Region. Kangaroo Press. Sydney.

Fuller. L. 2011. Wollongong's Native Trees. 3rd Edition. Tana Press Co. Ltd. Thailand.

Institute of Consulting Arborists, Australia. Sustainable Retention Index Value (SRIV). Version 4. www.icaa.org.au

Matheny, N. & Clark, J. R. 1998. Trees Development. International Society of Arboriculture.

SAFE WORK AUSTRALIA Code of Practice for Safe Acess for Tree Trimming and Arboriculture. 2011.

SAFE WORK AUSTRALIA Guide to managing risks tree trimming and removal work. 2016.

NSW WORKCOVER Code of Practice for the Amenity Tree Industry. August 1998; Catelogue No. 034.

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