ALLIED TREE
CONSULTANCY
Level 5 and 8 Arboriculturist

Arboricultural Impact Assessment Report

For the site address
Lot 38 (DP 202006),
No. 2 Kamira Avenue,
VILLAWOOD, NSW

Prepared for
Traders in Purple P/L

AUTHOR
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1.0 Introduction

1.1 *Allied Tree Consultancy* (ATC) has been commissioned by *Traders in Purple P/L* to prepare an Arboricultural Impact Assessment for the development proposal at No. 2 Kamira Avenue, Villawood. This proposal includes the construction of a residential dwelling development. This report includes Sixty eight (68) trees located on, and adjacent to the lot, however considered only those trees within Stage 1, being fifteen (15) trees. This is based upon the vicinity of the proposed works, and are subject to discussion regarding the viability of these trees based on the proposed works.

1.2 This report will address for these trees, the:

- species' identification, location, dimensions, and condition;
- SULE (Safe Useful Life Expectancy) and STARS (Significance of a Tree Assessment Rating System) rating;
- discussion and impact of the proposed works on each tree;
- tree protection zones and protection specifications for trees recommended for retention.

1.3 The subject site resides within Villawood; for this reason, Fairfield City Council is the consenting authority for any tree works recommended in this report.

2.0 Standards

2.1 Allied Tree Consultancy provides an ethical and unbiased approach to all assignments, possessing no association with private utility arboriculture or organisations that may reflect a conflict of interest.

2.2 This report must be made available to all contractors during the tendering process so that any cost associated with the required works for the protection of trees can be accommodated.

2.3 It is the responsibility of the project manager to provide the requirements outlined in this report relative to the Protection Zones, Measures (Section 7.0) and Specifications (Section 8.0) to all contractors associated with the project before the initiation of work.

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

- Australian Standard – AS4373; Pruning of Amenity Trees.
- Guide to Managing Risks of Tree Trimming and Removal Work[1].

[1] Safe Work Australia; July 2016; Guide to Managing Risks of Tree Trimming and Removal Work, Australia

- All tree works must be carried out at a tertiary level (minimum Certificate-level 3) qualified and experienced (minimum five years) arboriculturist.
- For any works in the vicinity of electrical lines, the arboriculturist must possess the ISSC26 endorsement (Interim guide for operating cranes and plant in proximity to overhead powerlines).

2.5 As a minimum requirement, all trees recommended for retention in this report must have removed all dead, diseased, and crossing limbs and branch stubs to be pruned to the branch collar. This work must comply with the local government tree policy (Fairfield City Council) and Section 2.4.

2.6 Any tree stock subject to conditions for works carried out in this report must be supplied by a registered Nursery that adheres to the AS 2303; 2015[2].

- All tree stock must be of at least 'Advanced' size (minimum 75lt) unless otherwise requested.
- All tree stock requested must be planted with adequate protection. This may include tree guards (protect stem and crown) and if planted in a lawn area, a suitable barrier (planter ring) of an area, at least, $1m^2$ to prevent grass from growing within the area adjacent to the stem.

3.0 Disclosure Statement

Trees are living organisms and, for this reason, possess natural variability. This cannot be controlled. However, risks associated with trees can be managed. An arborist cannot guarantee that a tree will be safe under all circumstances, nor predict the time when a tree will fail. To live or work near a tree involves some degree of risk, and this evaluation does not preclude all the possibilities of failure.

4.0 Methodology

4.1 The following tree assessment was undertaken using criteria based on the guidelines laid down by the International Society of Arboriculture.

4.2 The format of the report is summarised below;

4.2.1 **Plan 1;** Tree Location Relative to Site: This is an unscaled plan reproduced from the Survey Plan as referenced in Section 4.4.1, depicting the area of assessment.

[2] Australian Standard; 2015, AS2303, Tree stock for landscape use, Australia

4.2.2 Table 1; This table compiles the tree species, dimensions**,** brief assessment (history, structure, pest, disease or any other variables subject to the tree), significance, allocation of the zones of protection (i.e., Tree Protection Zone[3] ;TPZ and Structural Root Zone; SRZ) for each tree illustrated in Plan 1, Section 5.0. All measurements are in metres.

4.2.3 Discussion relating to the site assessment and proposed works regarding the trees.

4.2.4 Protection Specification; Section 8.0 details the requirements for that area designated as the Tree Protection Zone (TPZ), for those trees recommended for retention.

4.3 The opinions expressed in this report, and the material, upon which they are based, were obtained from the following process and data supplied:

4.3.1 Site assessment on the 16th September 2020 using the method of the Visual Tree Assessment[4]. This has included a Level 2 risk assessment, being a *Basic Assessment*[5]. The assessment has been conducted by Geoff Beisler[6] on behalf of *Allied Tree Consultancy*.

4.3.2 Trees included in this report are those that conform to the description of a prescribed tree by the local government policy.

4.3.3 All measurements, unless specified otherwise are taken from the tree centre.

4.3.4 Raw data from the preliminary assessment including the specimen's dimensions was compiled by the use of a diameter tape, height clinometer, angle finder, compass, steel probes, Teflon hammer, binoculars and recording instruments.

4.4 Documentation provided

The following documentation has been provided to Allied Tree Consultancy and utilised within the report.

[3] Australian Standard, 4970; 2009 – Protection of Trees on Development Sites, Australia
[4] Mattheck, C. Breloer, H.,1994, The Body Language of Trees – A handbook for failure analysis The Stationary Office, London
[5] Dunster J.A., 2013, Tree Risk Assessment Manual, International Society of Arboriculture, 2013, USA
[6] Consulting Arborist, Diploma of Arboriculture (level 5)

4.4.1 Surveyor

Drawn by *PWA Surveying*
Date: 23 May 2018
Reference: (Plan No.) 57551
Drawing No: Sheet 1 of 3
Note 1: See Section 4.5.1

4.4.2 Design

Drawn by *DKO Architecture (NSW)*
Date: 18 June 2021
Reference: 2021002
Drawing No: DA000-DA801, Rev. A
Note 2: See Section 4.5.2

4.4.3 Engineering

Drawn by *MRC Consulting Engineers*
Date: April 2021
Reference: J21115
Drawing No: C-1.10, Revision A

4.4.4 Engineering (Stormwater)

Drawn by *MRC Consulting Engineers*
Date: 11 May 2021
Reference: J21115
Pages: 35

4.4.5 Landscape

Drawn by *Landform Studios*
Date: 23 June 2021
Pages: 53

4.5 Limitations of the assessment/discussion process

4.5.1 Tree No. 35 has been omitted from the plans provided, however, is required for inclusion because it conforms to the definition of a prescribed tree within the local government tree policy. The tree location has been plotted onto the Plan 1 by *Allied Tree Consultancy*. The tree location was established by measuring from known points and scaling onto the drawing. *Allied Tree Consultancy* is not a registered surveyor and, however, the accuracy of the survey is attempted; the true position of this tree may marginally deviate. Any such deviation provides the

potential for changing the actual impact (encroachment) provided to a tree.

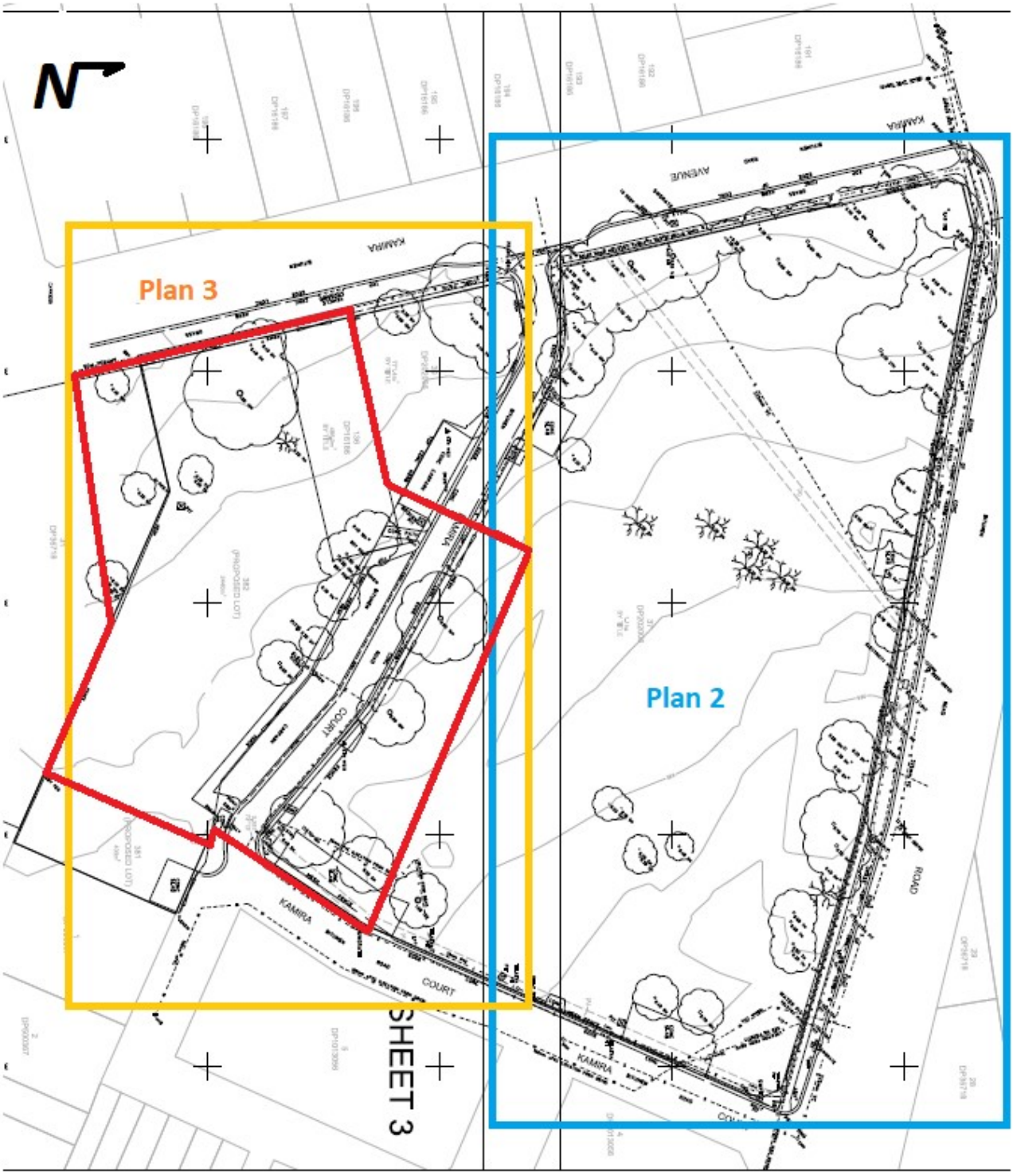
4.5.2 An area to the south of the area of assessment and labelled Area A on Plan 1, Section 5.0 is apparently impacted by the proposed works. This area has no trees located on the survey provided, and has been outside the scope of works issued to ATC. Although mature trees defined as prescribed trees appear in this area.

4.5.3 The assessment has considered only those target zones that are apparent to the author and the visually apparent tree conditions, during the time of assessment.

4.5.4 Any tree regardless of apparent defects would fail if the forces applied to exceed the strength of the tree or its parts, for example, extreme storm conditions.

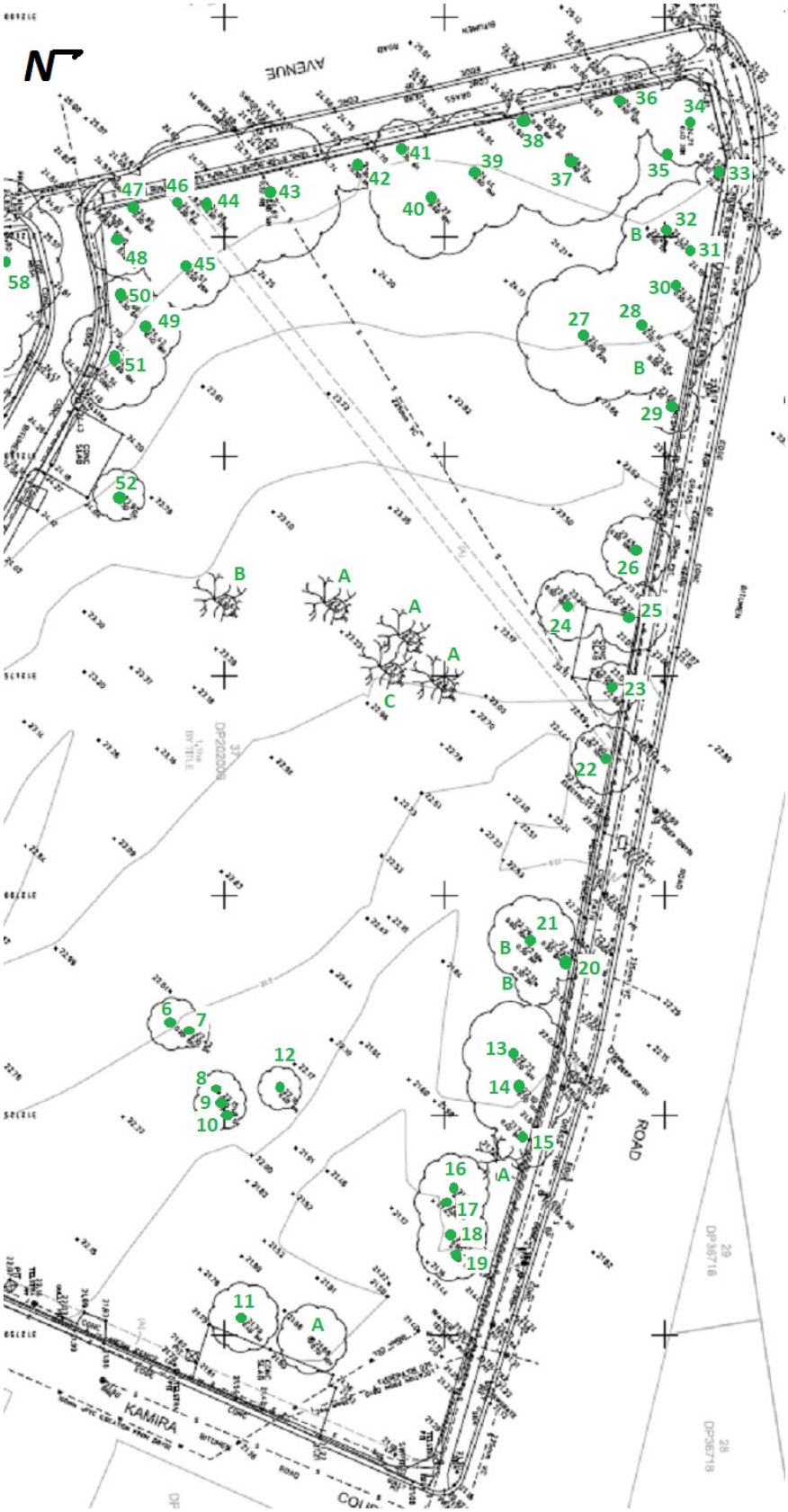
4.5.5 The assessment has been limited to that part of the tree which is visible, existing from the ground level to the crown. Root decay can exist and in some circumstances provide no symptoms of the presence. This assessment responds to all the symptoms provided by a tree, however, cannot provide a conclusive recommendation regarding any tree that may have extensive root decay that leads to windthrow without the appropriate symptoms.

5.0 Plan 1; Area of assessment



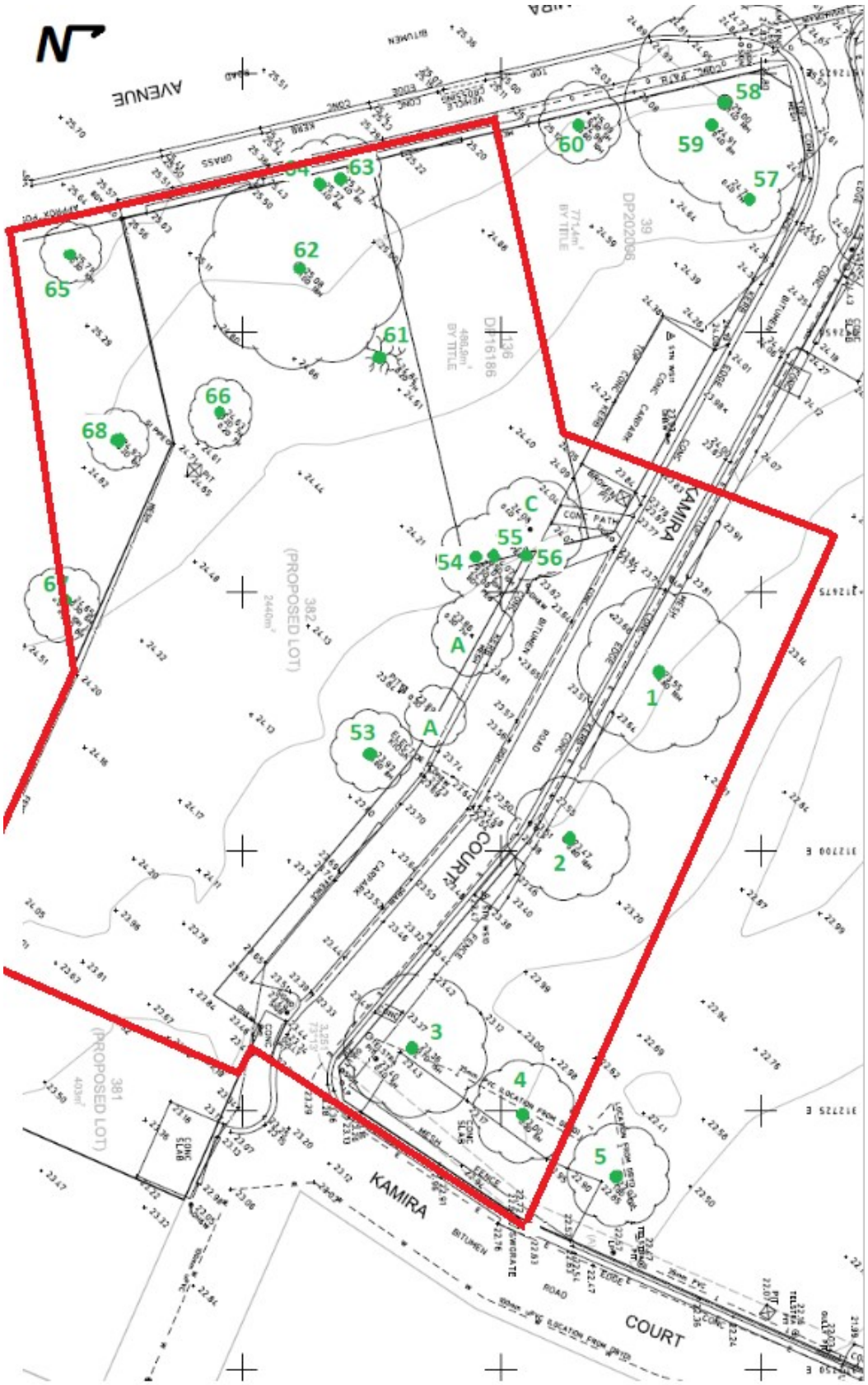
Not to scale.
Area A is located outside the scope of works, and has no trees located on the survey.
The 'subject site' outlined in red illustrates the area discussed for development.
Source: Adapted from *PWA Surveying,* see Section 4.4.1

5.1 Plan 2; Area of assessment illustrating tree location



Not to scale.
Trees labelled A, B and C, see Section 7.0.
Source: Adapted from *PWA Surveying,* see Section 4.4.1

5.2 Plan 3; Area of assessment illustrating tree location



Not to scale.
The area outlined in red illustrates the area discussed for development.
Trees labelled A, B and C, see Section 7.0.
Source: Adapted from *PWA Surveying,* see Section 4.4.1

6.0 Table 1 – Tree Species Data

Terminology/references provided in Appendix A.

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
1	*Eucalyptus microcorys* Tallowwood	20	0.86	17 x 17	M	D	Sym.	A	**1A**	**High**	**10.32**	**3.11**
Assessment This large and significant tree presents as typical for the species.											**Development Impact** See Section 7.1.3	
2	*Corymbia maculata* Spotted Gum	21	0.92	16 x 18	M	D	Sym.	A	**1A**	**High**	**11.04**	**3.20**
Assessment This large and significant tree presents as typical for the species.											**Development Impact** See Section 7.1.3	
3	*Eucalyptus nicholii* Black Peppermint [A]	14	0.70[B,C]	10 x 10	M	D	N	B-C	**3A**	**Low**	**8.40**	**2.85**
Assessment This tree presents excessive decline.											**Development Impact** See Section 7.1.2 and 7.1.3	
4	*Melaleuca quinquenervia* Broad Leaf Paperbark	6	0.36	7 x 6	M	I	Sym.	A	**1A**	**Medium**	**4.32**	**2.15**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.3	
5	*Melaleuca quinquenervia* Broad Leaf Paperbark	11	0.96	10 x 10	M	D	Sym.	A	**1A**	**High**	**11.52**	**3.25**
Assessment This tree presents as typical for the species. The DBH is exaggerated by the thick bark. Extensive removal of the papery outer bark on the lower stem and 1st order branches; this appears to have been inflicted by native parrots. No wounding of the live											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
tissue was observed.												
6	*Callistemon viminalis* Weeping Red Bottlebrush	6	0.28[B]	5 x 5	M	C	S	A	**2A**	**Medium**	**3.36**	**1.94**
Assessment Several aged tear out wounds are present, as is an aged wound from a co-dominant union failure, lower crown.											**Development Impact** See Section 7.1.1	
7	*Callistemon viminalis* Weeping Red Bottlebrush	5	0.12	3 x 3	M	C	Sym.	A	**2D**	**Medium**	**1.44**	**1.36**
Assessment This tree presents as typical for the species. An aged failure wound is present at 2.3m. A vertical wound and stub ate located at the base, north side, probing reveals a basal cavity.											**Development Impact** See Section 7.1.1	
8	*Melaleuca quinquenervia* Broad Leaf Paperbark	6	0.17[B]	2 x 2	M	C	W	B-C	**3A**	**Low**	**2.04**	**1.57**
Assessment This tree is poor specimen. Excessive decline and Sooty Mould is evident											**Development Impact** See Section 7.1.1	
9	*Melaleuca quinquenervia* Broad Leaf Paperbark	7	0.26	5 x 5	M	C	Sym.	C	**3A**	**Low**	**3.12**	**1.88**
Assessment This tree presents excessive decline. Large aged failure of main stem at 4m. Sooty mould. A juvenile of the same species, not located on the survey, is located in the SRZ, south eastern side.											**Development Impact** See Section 7.1.1	
10	*Melaleuca quinquenervia* Broad Leaf Paperbark	8	0.16	4 x 4	M	C	E	B	**2D**	**Medium**	**1.92**	**1.53**
Assessment This tree exhibits some twiggy decline, and Sooty Mould is present A juvenile of the same species, not located on the survey, is located in the SRZ, northern side.											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
11	*Eucalyptus nicholii* Black Peppermint	9	0.42	2 x 2	M	D	Sym.	C	**4A**	**Low**	**5.04**	**2.30**
Assessment This tree presents excessive decline.											**Development Impact** See Section 7.1.1	
12	*Fraxinus angustifolia Raywood'* Claret Ash [A]	10	0.70[B,C]	5 x 5	M	D	Sym.	C	**4A**	**Low**	**8.40**	**2.85**
Assessment This tree presents excessive decline. The western stem has failed, decay is evident.											**Development Impact** See Section 7.1.1	
13	*Eucalyptus microcorys* Tallowwood	20	0.67	21 x 18	M	C	W	A	**1B**	**High**	**8.04**	**2.80**
Assessment This tree presents as typical for the species, however may experience future conflict with surrounding trees.											**Development Impact** See Section 7.1.1	
14	*Eucalyptus microcorys* Tallowwood	18	0.58	17 x 17	M	C	E	A	**1B**	**High**	**6.96**	**2.63**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
15	*Melaleuca styphelioides* Prickly-leaved Paperbark	8	0.30	6 x 5	M	I	E	A	**1B**	**High**	**3.60**	**2.00**
Assessment This tree presents as typical for the species. Another of the species (6m), not located on the survey, is within the SRZ, eastern side.											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
16	*Melaleuca styphelioides* Prickly-leaved Paperbark	8	0.25 0.25	7 x 6	M	C	N	A	**1B**	**High**	**4.24**	**2.14**
Assessment This tree presents as typical for the species. Two more of the species (6m), not located on the survey, are within SRZ, eastern side.											**Development Impact** See Section 7.1.1	
17	*Melaleuca styphelioides* Prickly-leaved Paperbark	9	0.29	6 x 6	M	C	S	A	**1B**	**High**	**3.48**	**1.97**
Assessment This tree presents as typical for the species. Two more of the species (6m), not located on the survey, are within SRZ, western side.											**Development Impact** See Section 7.1.1	
18	*Melaleuca styphelioides* Prickly-leaved Paperbark	9	0.34	7 x 7	M	C	Sym.	A	**1B**	**High**	**4.08**	**2.10**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
19	*Melaleuca styphelioides* Prickly Leaved Paperbark	8	0.32[B]	7 x 5	M	C	E	A	**1B**	**High**	**3.84**	**2.05**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
20	*Melaleuca styphelioides* Prickly-leaved Paperbark	8 (Average)	0.20[C] (Average)	4 x 4 (Average)	M	C	Sym.	A	**2A**	**Medium**	**2.40**	**1.68**
Assessment This is a linear planting of 6 specimens, however only one is located on the survey.											**Development Impact** See Section 7.1.1	
21	*Lophostemon confertus* Brush Box	12	0.53	9 x 9	M	C	Sym.	A	**1B**	**High**	**6.36**	**2.53**
Assessment This tree presents as typical for the species, however is experiencing minor conflict with tree(s) No. 20.											**Development Impact** See Section 7.1.1	
22	*Melaleuca styphelioides* Prickly Leaved Paperbark	11	0.70	9 x 9	M	D	Sym.	A	**1A**	**High**	**8.40**	**2.85**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
23	*Callistemon viminalis* Weeping Red Bottlebrush	6	0.30	5 x 5	M	D	Sym.	A	**2A**	**Medium**	**3.60**	**2.00**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
24	*Melaleuca quinquenervia* Broad Leaf Paperbark	7	0.51	8 x 6	M	C	S	A	**1B**	**High**	**6.12**	**2.49**
Assessment This tree presents as typical for the species. Extensive removal of the papery outer bark on the lower stem and 1st order branches; this appears to have been inflicted by native parrots. No wounding of the live tissue was observed.											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
25	*Melaleuca styphelioides* Prickly Leaved Paperbark	9 (Average)	0.30 (Average)	8 x 8 (Total)	M	C	Sym.	A	**1B**	**High**	**3.60**	**2.00**
Assessment This is two trees, side by side, sharing a common root mass. A juvenile of the same species is located within the shared SRZ, northern side.											**Development Impact** See Section 7.1.1	
26	*Melaleuca quinquenervia* Broad Leaf Paperbark	8	0.47	8 x 8	M	C	N	A-B	**2A**	**High**	**5.64**	**2.41**
Assessment This tree presents as typical for the species, however a suggestion of partial density, upper crown, exists.											**Development Impact** See Section 7.1.1	
27	*Eucalyptus scoparia* Wallangarra White Gum	16	0.69	13 x 13	M	C	Sym.	A	**2A**	**High**	**8.28**	**2.83**
Assessment This tree presents as typical for the species. Some wounding, apparently inflicted by native parrots, is located in 1st order branch unions, southern side.											**Development Impact** See Section 7.1.1	
28	*Corymbia citriodora* Lemon Scented Gum	21	0.57	16 x 16	M	C	N	A-B	**2A**	**High**	**6.84**	**2.61**
Assessment This tree presents as typical for the species, however a suggestion of partial density, upper crown, exists.											**Development Impact** See Section 7.1.1	
29	*Melaleuca styphelioides* Prickly-leaved Paperbark	8 (Average)	0.20 (Average)	6 x 5 (Total)	M	I	N	A	**2A**	**Medium**	**2.40**	**1.68**
Assessment This is a grove of 3 trees, all typical of the species.											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
30	*Corymbia citriodora* Lemon Scented Gum	20	0.45	12 x 9	M	C	Sym.	A	**1B**	**High**	**5.40**	**2.37**
Assessment This tree presents as typical for the species, however may experience minor conflict with surrounding trees.											**Development Impact** See Section 7.1.1	
31	*Corymbia maculata* Spotted Gum [A]	19	0.54	14 x 13	M	C	W	A	**1B**	**High**	**6.48**	**2.55**
Assessment This tree presents as typical for the species, however may experience minor conflict with surrounding trees. May be *Corymbia citriodora.*											**Development Impact** See Section 7.1.1	
32	*Eucalyptus sideroxylon* Mugga Ironbark	14	0.31	5 x 5	M	I	W	C	**3A/C4** [E]	**Low**	**3.72**	**2.02**
Assessment This tree is a poor specimen, much decline is evident in the small crown. Swelling in the stem at 2m and 4.5m suggests internal issues.											**Development Impact** See Section 7.1.1	
33	*Melaleuca styphelioides* Prickly Leaved Paperbark	7	0.30 0.30[B]	7 x 7	M	I	Sym.	A	**1B**	**Medium**	**5.09**	**2.31**
Assessment This two trees, side by side, sharing a common root mass.											**Development Impact** See Section 7.1.1	
34	*Corymbia citriodora* Lemon Scented Gum	19	0.36	12 x 10	M	D	Sym.	A	**1A**	**High**	**4.32**	**2.15**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
35	*Eucalyptus crebra* Narrow Leafed Ironbark [A]	6	0.11 0.11	4 x 4	Y	S	Sym.	A	**2A**	**Low**	**1.87**	**1.51**
Assessment											**Development Impact**	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
This tree presents as typical for the species. Not located on the survey provided.											See Section 7.1.1	
36	*Melaleuca styphelioides* Prickly Leaved Paperbark	7	0.47[B]	8 x 6	M	I	N	B	**2D**	**Medium**	**5.64**	**2.41**
Assessment Decline is evident in the southern crown. Another of the same species (6m) is within the SRZ, southern side.											**Development Impact** See Section 7.1.1	
37	*Corymbia maculata* Spotted Gum	19	0.62	16 x 16	M	C	Sym.	A	**1B**	**High**	**7.44**	**2.71**
Assessment This tree presents as typical for the species, however may experience minor conflict with surrounding trees.											**Development Impact** See Section 7.1.1	
38	*Melaleuca styphelioides* Prickly-leaved Paperbark	6 (Average)	0.17 (Average)	3 x 3 (Average)	M	S	Sym.	A	**2A**	**Medium**	**2.04**	**1.57**
Assessment This is a grove (linear planting) of 4 specimens. The most southerly exhibits some crown decline.											**Development Impact** See Section 7.1.1	
39	*Eucalyptus sideroxylon* Mugga Ironbark	16	0.52	10 x 11	M	C	S	A	**1B**	**High**	**6.24**	**2.51**
Assessment This tree presents as typical for the species, however may experience minor conflict with surrounding trees.											**Development Impact** See Section 7.1.1	
40	*Eucalyptus sideroxylon* Mugga Ironbark	15	0.48 0.10	10 x 15	M	C	Sym.	A	**1B**	**High**	**5.88**	**2.45**
Assessment Co-dominant at 2m. Minor twiggy decline is evident in the upper crown, western side											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
41	*Melaleuca styphelioides* Prickly Leaved Paperbark	8	0.22 0.20	7 x 7	M	S	N	A	**1B**	**Medium**	**3.57**	**1.99**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
42	*Melaleuca styphelioides* Prickly Leaved Paperbark	8	0.31 0.34	9 x 9	M	C	Sym.	A	**1B**	**Medium**	**5.52**	**2.39**
Assessment This is two trees side by side, sharing a common root mass.											**Development Impact** See Section 7.1.1	
43	*Eucalyptus robusta* Swamp Mahogany	14	0.63	12 x 14	M	C	N	A	**1B**	**High**	**7.56**	**2.73**
Assessment This tree presents as typical for the species, however may experience minor conflict with surrounding trees. A mature *Melaleuca*, (however less than 6m) is located within the SRZ, western side.											**Development Impact** See Section 7.1.1	
44	*Eucalyptus microcorys* Tallowwood	21	0.91 [B]	18 x 18	M	C	Sym.	A	**1B**	**High**	**10.92**	**3.18**
Assessment This large and significant tree presents as typical for the species, however may experience minor conflict with surrounding trees. Co-dominant at the base.											**Development Impact** See Section 7.1.1	
45	*Eucalyptus sideroxylon* Mugga Ironbark	19	0.52	10 x 7	M	C	E	B	**1B**	**High**	**6.24**	**2.51**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
46	*Melaleuca styphelioides* Prickly Leaved Paperbark	5	0.19[B]	4 x 4	M	S	W	A	**2A**	**Medium**	**2.28**	**1.65**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
47	*Melaleuca styphelioides* Prickly Leaved Paperbark	7 (Average)	0.30 0.24 (Both)	5 x 5 (Average)	M	S	Sym.	A	**2A**	**Medium**	**4.61**	**2.21**
Assessment This is two trees, side by side.											**Development Impact** See Section 7.1.1	
48	*Eucalyptus globulus* Tasmanian Blue Gum [A]	7	0.34	7 x 4	M	I	S	C	**4A/4C**	**Low**	**4.08**	**2.10**
Assessment This tree presents excessive decline. Wounding and associated decay are evident in the stem,											**Development Impact** See Section 7.1.1	
49	*Eucalyptus sideroxylon* Mugga Ironbark	16	0.30[C]	6 x 2	M	D	Sym.	C	**4A**	**Low**	**3.60**	**2.00**
Assessment This tree presents excessive decline.											**Development Impact** See Section 7.1.1	
50	*Melaleuca quinquenervia* Broad Leaf Paperbark	7	0.25	6 x 5	M	C	Sym	A	**1B**	**Medium**	**3.00**	**1.85**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
51	*Eucalyptus sideroxylon* Mugga Ironbark	17	0.46	11 x 9	M	D	E	B	**2D**	**Medium**	**5.52**	**2.39**
Assessment This tree presents significant decline.											**Development Impact** See Section 7.1.1	
52	*Unknown spp.*	6	0.39[B,C]	4 x 4	M	D	Sym.	C	**4A**	**Low**	**4.68**	**2.23**
Assessment This tree presents excessive decline.											**Development Impact** See Section 7.1.1	
53	*Melaleuca quinquenervia* Broad Leaf Paperbark	7	0.50[B,C]	7 x 4	M	D	N	B-C	**3A**	**Low**	**6.00**	**2.47**
Assessment This tree presents excessive decline.											**Development Impact** See Section 7.1.2 and 7.1.3	
54	*Melaleuca styphelioides* Prickly Leaved Paperbark	9	0.35	8 x 8	M	C	S	A	**1B**	**Medium**	**4.20**	**2.13**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.3	
55	*Melaleuca styphelioides* Prickly Leaved Paperbark	9	0.43[B]	7 x 8	M	C	N	A	**1B**	**Medium**	**5.16**	**2.32**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.3	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
56	*Callistemon viminalis* Weeping Red Bottlebrush	8	0.20 0.15	8 x 7	M	C	W	A	**2A**	**Medium**	**3.00**	**1.85**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.3	
57	*Callistemon viminalis* Weeping Red Bottlebrush	6	0.27[B]	6 x 5	M	I	E	A	**2A**	**Medium**	**3.24**	**1.91**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
58	*Ficus obliqua* Small Leafed Fig [A]	16	1.40[B,C]	20 x 21	M	D	Sym.	A	**1B**	**High**	**16.80**	**3.81**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.1	
59	*Melaleuca quinquenervia* Broad Leaf Paperbark	10	0.30[C]	1 x 1	M	S	S	C	**4A**	**Low**	**3.60**	**2.00**
Assessment This tree is 99% dead.											**Development Impact** See Section 7.1.1	
60	*Melaleuca styphelioides* Prickly Leaved Paperbark	10	0.42 0.29[C]	8 x 6	M	D	Sym.	A	**1B**	**High**	**6.12**	**2.49**
Assessment This is two trees, side by side.											**Development Impact** See Section 7.1.1	
61	*Eucalyptus crebra* Narrow Leafed Ironbark	8	0.14	3 x 3	M	D	Sym.	A	**1B**	**Low**	**1.68**	**1.45**
Assessment											**Development Impact**	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
This is a group of 4 (apparent) sprouts at the base if a completely failed tree, however they may be independent juveniles. Regardless, they possess independent root mass.											See Section 7.1.1	
62	*Eucalyptus crebra* Narrow Leafed Ironbark [A]	20	1.00 0.15 0.10	20 x 17	M	D	Sym.	A	**2A**	**High**	**12.19**	**3.33**
Assessment This is a large and significant remnant tree. A deadwood hanger is located at 13m, western Side. Wounding is located on the stem (base), western side. Minor twiggy decline is evident in the upper crown, southern side.											**Development Impact** See Section 7.1.4	
63	*Melaleuca styphelioides* Prickly Leaved Paperbark	7	0.35[B]	8 x 5	M	C	W	A	**2A**	**Medium**	**4.20**	**2.13**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.4	
64	*Melaleuca styphelioides* Prickly Leaved Paperbark	8	0.41[B]	8 x 6	M	S	E	A	**2A**	**Medium**	**4.92**	**2.28**
Assessment This tree presents as typical for the species.											**Development Impact** See Section 7.1.4	
65	*Corymbia maculata* Spotted Gum	10	0.30[C]	6 x 6	M	D	Sym.	A	**1A**[C]	**Medium**	**3.60**	**2.00**
Assessment This neighbouring tree presents as typical for the species.											**Development Impact** See Section 7.1.3	
66	*Eucalyptus crebra* Narrow Leafed Ironbark [A]	7 (Average)	0.15 (Average)	3 x 4 (Average)	Y	C	Sym.	A	**1B**	**Low**	**1.80**	**1.49**
Assessment This is a grove if 3 juveniles, side by side, figures are averages											**Development Impact** See Section 7.1.1	

Tree No.	*Botanical Name* Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality Rating	SULE Rating	STARS Rating	TPZ	SRZ
67	*Corymbia maculata* Spotted Gum	10	0.22[C]	5 x 5	M	D	Sym.	A	**1A**[C]	**Medium**	**2.64**	**1.75**
Assessment This is a neighbouring tree, typical for the species. Two *Melaleuca* are located within the SRZ, both are <5m.											**Development Impact** See Section 7.1.3	
68	*Eucalyptus crebra* Narrow Leafed Ironbark [A]	10	0.20 0.20 [C]	5 x 6	M	D	Sym.	A	**1B**[C]	**Medium**	**3.60**	**2.00**
Assessment This large and significant tree presents as typical for the species.											**Development Impact** See Section 7.1.3	

A. Incomplete identification of species due to insufficiently available plant material
B. Diameter taken below 1.4m due to low stem bifurcation
C. Estimate due to the overgrown area and/or limited access
D. Deciduous species, void of foliage at the time of assessment
E. Level 3 assessment required to determine the accurate rating

7.0 Site Assessment

The area of assessment comprises that portion of the original assessment area, now indicated to be subject to works- this being the southern portion of the lot and referred to as Stage 1. An area on the southern side of Kamira Court is dedicated to car parking, the remainder being open, maintained lawn. This area appears level, with a slight possible gradient and northerly aspect. An area to the south of the area of assessment is apparently impacted by the proposed works. This area has no trees located on the survey provided, and was outside the scope of works. The trees are predominantly deliberate plantings, however several trees are of a size indicating possible remnant status, particulaly tree No. 62. Multiple dead trees are located on the site, as are trees less than 5m in height. Multiple small trees, however greater than 5m in height, are located in the SRZ of larger trees, and not located on the survey provided- these have not been included.

The trees labeled as A, B, and C, that have been included on the survey drawing (Plan 1) however excluded from this report because of the failure to conform to the description of a prescribed tree based on the Fairfield City Councils Development Control Plan.

Tree A: dead trees.

Tree B: trees located on the survey however were absent.

Tree C: trees less than 5m in height

7.1 Proposed development

The proposed development consists of the construction of a residential unit development, drive access, and drainage infrastructure.

The calculations included in the following discussion has not considered;

- subsurface utilities that have not been included in the design,
- Work methods related to subsurface utilities, for example concrete encasing or replacement of existing lines
- or work methods related to construction (stockpiling, site sheds, scaffolding) unless otherwise specified.

These may also increase the encroachment and tree impact and therefore the opportunity for tree retention.

The ‘Area A’ illustrated on Plan 1, Section 5.0 has been located outside the scope of works, nor has this area any trees located on the survey. However, this areas contains trees and the area is subject to impacts be the proposed design.

This report discusses the impact of the proposed design on the trees. Sixty eight (68) trees have been included in this report, however only fifteen (15) trees

have been considered within this report based upon the vicinity of the proposed works adjacent to Stage 1. This has included street and neighbouring trees where any part of the zones of protection; Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) to encroach into the lot. Recommendations based on the tree significance and condition, together with the impact on these trees regarding the development for this lot follow;

7.1.1 Trees and zones of protection (TPZ/SRZ) outside of the proposed design

Trees No. 5-52, 57-61 and 66

None of the proposed works conflict with the location of these trees or respective zones of protection. These trees can be retained without impact by the proposed design.

7.1.2 Trees providing a limited useful life expectancy

Trees No. 3 and 53

These trees provide low significance based on the species, habit and rating and could be removed due to the low amenity value and limited useful life expectancy.

7.1.3 Trees directly conflicting with the design

Trees No. 1-4, 53-56, 65, 67 and 68

These trees are located in the footprint of the proposed design and would require removal based on this premise alone. The conflict is summarised as follows;

Trees No. 1-4, 53-56, 66 and 68; within the footprint of the proposal

Tree No. 65; within the footprint of an (apparent) planter box, entry plaza

Tree No. 67; within the footprint of the parking loading entry/ vehicular entry.

7.1.4 Trees subject to a major encroachment

Trees No. 62, 63 and 64

This tree is not directly located in the footprint of the proposed design, however, it is located close and adjacent to the design footprint and subject to a *major encroachment*, that is, in excess of 10% of the TPZ. The extent and type of encroachment for the tree is discussed and the relative implications.

The drawing titled 'Bulk earthworks layout plan' (see Section 4.4.3) indicates cut throughout the area of these trees. Therefore, based on this drawing alone, these trees could not be retained. The reason or extent of this cut is unknown and could likely be modified to reduce the impact and allow for tree retention.

Tree No. 62: Encroachment: approximately 47%; based on drawing (page 30) and Section (page 33) of the landscape design (Section 4.4.5). The encroachment consists of the paved boardwalk/rain garden and residential units towards the east and south and approximately 4000mm from the tree, and footpath on the western side. The encroachment formed by the residential units only, is acceptable for long term tree retention. However, the accumulative encroachment formed by the council dedicated public open space (Villawood park Green), being indicated as the area to the west of the green dashed line on the drawing titled *Ground Plane Howatt St. (West)*, (being page 30 of the landscape drawing) presents grade changes for proposed structures including excavation that will impact adversely on this tree. These are unlikely to destabilise the tree, however, provide the potential to adversely affect the vitality and place the tree in decline.

This area has been referred to be subject to further design development, and as part of this, these structures should be amended to reduce the impact and allow for retention for a tree rated as high significance. To allow for the retention of this tree, the conditions outlined in *Design mitigation* require adherence and amendment of the grades and structures.

Trees No. 63 and 64: Encroachment: approximately 45%; an apparent footpath (or similar) is illustrated near flush with these trees, however no indication of the grades exists, as will the potential impact. This structure could likely be design to reduce the impact and allow for retention for these trees.

Design mitigation

The following discussion refers to the conditions required for the 'paved boardwalk' and 'footpath', being the design components that form the major encroachment on trees No. 62-64. The following conditions refer to the areas of footpath and paved boardwalk that encroach into the TPZ for each tree. These trees are likely to be capable for long term retention although limited to the impact these works provide.

Footpath

1. The natural grade shall be retained and the footpath surface layered over the top of this grade. Some scraping of the surface can occur and shall not exceed 50mm of the existing grade. Opportunity to excavate deeper than 50mm will be based on the results of exploratory measures (root mapping) provided by the project arborist.

2. The footpath surface that forms the encroachment into the TPZ shall be a porous/flexible type surface, for example *FiltaPave*[7] *or Hydroston* pavers[8]. The surface employed shall be confirmed to be suitable by the project arborist.

Paved boardwalk

3. The natural grade shall be retained and the paved boardwalk surface layered over the top of this grade. Some scraping of the surface can occur and shall not exceed 50mm of the existing grade. Opportunity to excavate deeper than 50mm will be based on the results of exploratory measures (root mapping) provided by the project arborist.
4. If the finished surface is greater than 200mm above natural grade, then fill material must be a sand/aggregate based texture and no clay. The fill employed shall be confirmed to be suitable by the project arborist. Fill material cannot exceed 300mm depth.
5. If the finished surface is greater than 400mm above natural grade, then the board walk will require to be suspended above natural grade so that an air space exists between the suspended boardwalk and natural (existing) grade.
6. The boardwalk surface that forms the encroachment into the TPZ shall be a porous type surface. The surface employed shall be confirmed to be suitable by the project arborist.

7.2 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities, other than stormwater. Any trenching, other than what has been allowed for should be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of a service is restricted to an area that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

7.3 Protection measures

The following protection measures are required to be implemented for the following trees before initiation of site works (including demolition/excavation) and retained until the landscaping works are required unless otherwise specified.

7.3.1 Ground protection: Tree No. 62, 63 and 64

Ground protection is required and in regards to the requirements of the AS 4970, listed in Appendix B. This must be installed prior to the commencement of any demolition, excavation or construction works and

[7] www.filtapave.com.au
[8] www.hydroston.com.au

shall be maintained throughout the entire construction phase of the development, and until landscaping works and installation of the drive/cross-overs is required.

7.3.2 Protective fence: Tree No. 5-52 and 57-65

A protective fence is required to be installed to protect the TPZ from all site-related work and are recommended to be located in accordance with the requirements of the AS 4970, listed in Appendix B. The fence is required to be secured to the ground with pegs to avoid movement during construction. This must be installed prior to the commencement of any demolition, excavation or construction works and shall be maintained throughout the entire construction phase of the development, and until landscaping works and installation of the drive/cross-overs is required.

7.3.3 Conditions for compliance

The following conditions are required before any works proceed on site.

Site induction; All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work. This is required as part of the site induction process.

Project Arborist; A project arborist who conforms to the requirements of the AS 4970 is required to be nominated immediately after a *Notice of Determination* is issued, and they are to be provided with all related site documents.

7.4 Compliance Documentation

The following stages will require assessment and documentation (report, letter, certification) by the project arborist or person responsible for the specific work type, and the related documentation is to be issued to the principal certifying agent.

7.4.1 Table 2; Assessment/Certification stages

Hold Points	Work type	Document required
Pre-demolition	Installation of the protection measures, Section 7.3	Certificate*
During construction	Any further works required within the area of the TPZ, or decline related to the trees that have not been covered by this report.	Report Brief
During	Any crown modification including	Report Brief

construction	pruning or root disturbance.	

Construction refers to the time between the initiation of demolition and until an occupation certificate is issued.

Project Arborist person nominated as responsible for the provision of the tree assessment, arborist report, consultation with stakeholders, and certification for the development project. This person will be adequately experienced and qualified with a minimum of a level 5 (AQF); Diploma in Horticulture (Arboriculture)[9].

8.0 Protection Specification

The retention and protection of these trees requires the remaining Tree Protection Zone (TPZ) not subject to encroachment to conform to the conditions outlined below. These conditions provide the limitations of work permitted within the area of the Tree Protection Zone (TPZ) and must be adhered to unless otherwise stated.

1. Crown pruning can be accommodated, however, must conform to the AS 4373; *Pruning of Amenity Trees*, and not misshape the crown nor remove in excess of 10-15% of the existing crown, pending on the species, and vitality. The opportunity for, type and proportion of pruning will be required to be nominated by the project arborist.

2. Soil levels within the TPZ must remain the same. Any excavation within the TPZ must have been previously specified and allowed for by the project arborist:

   a) So it does not alter the drainage to the tree.

   b) Under specified circumstances,

   - Added fill soil does not exceed 100mm in depth over the natural grade. Construction methodologies exist that can allow grade increases in excess of 100mm, via the use of an impervious cover, an approved permeable material or permanent aeration system or other approved methods.

   - Excavation cannot exceed a depth of more than 50mm within the area of the TPZ, not including the SRZ. The grade within the SRZ cannot be reduced without the consent from a project arborist.

3. No form of material or structure, solid or liquid, is to be stored or disposed of within the TPZ.

4. No lighting of fires is permitted within the TPZ.

[9] Based upon the definition of a 'consulting arborist' from the AS 4970; Protection of trees on development sites; 2009, Section 1.4.4, p 6.

5. All drainage runoff, sediment, concrete, mortar slurry, paints, washings, toilet effluent, petroleum products, and any other toxic wastes must be prevented from entering the TPZ.

6. No activity that will cause excessive soil compaction is permitted within the TPZ. That is, machinery, excavators, etc. must refrain from entering the area of the TPZ unless measures have been taken, and with consultation with the project, arborist to protect the root zone.

7. No site sheds, amenities or similar site structures are permitted to be located or extend into the area of the TPZ unless the project arborist provides prior consent.

8. No form of construction work or related activity such as the mixing of concrete, cutting, grinding, generator storage or cleaning of tools is permitted within the TPZ.

9. No part of any tree may be used as an anchorage point, nor should any noticeboard, telephone cable, rope, guy, framework, etc. be attached to any part of a tree.

10. (a) All excavation work within the TPZ will utilise methods to preserve root systems intact and undamaged. Examples of methods permitted are by hand tools, hydraulic, or pneumatic air excavation technology.

(b) Any root unearthed which is less than 50mm in diameter must be cleanly cut and dusted with a fungicide, and not allowed to dry out, with minimum exposure to the air as possible.

(c) Any root unearthed which is greater than 50mm in diameter must be located regarding their directional spread and potential impact. A project arborist will be required to assess the situation and determine future action regarding retaining the tree in a healthy state.

9.0 Summary of tree impact by design

Based on the design supplied, the following summary provides the impacts imposed on the trees included in this report.

9.1 Trees No. 5-52, 57-61 and 66

These trees are not adversely impacted by the design, that is, they conform to a minor encroachment or less and the nominated zones of protection (TPZ, SRZ) based on the requirements of the Protection Specification, Section 8.0. The proposed design does not adversely affect these trees.

9.2 Trees No. 1-4, 53-56, 65, 67 and 68

The proposed design will impact adversely on these trees and are unable to be retained based on the design.

9.3 Trees No. 62, 63 and 64

These trees are subject to a major encroachment that will adversely impact on each tree. The encroachment formed by the residential units only, is acceptable for long term tree retention. However, the accumulative encroachment formed by the council dedicated public open space (Villawood park Green) will adversely impact on these trees. In addition, the cut/fill drawing illustrates complete cut throughout the area. This removes the ability to retain these trees, although accounting for the proposed use, the reason for the cut is unknown as is the depth of cut. Accounting for the significance of these trees, and especially tree No. 62, efforts for amending the design to remove the impacts throughout the TPZ to allow for retention should be considered.

A design mitigation refers to the conditions required for the 'paved boardwalk', 'rain garden' and 'footpath', being the design components that form the major encroachment on trees No. 62-64. To allow for long-term tree retention, the conditions No. 1-6 discussed in Section 7.1.4 should be employed.

9.4 Sub-surface utilities

No drawings have been provided for the proposed route of sub-surface utilities, other than stormwater. Any trenching, other than what has been allowed for should be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed route shall be re-routed outside of the TPZ. Under boring may be required if a limitation for the route of a service is restricted to an area that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

9.5 Protection measures

Protection measures (outlined in Section 7.3 and 7.4) are required to be implemented for the trees nominated for retention (referenced in Section 9.1) and installed before initiation of site works (including demolition/excavation) and retained until the landscaping works are required unless otherwise specified.

All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work.

A project arborist is required to be nominated, and the stages and related certification or similar documentation is to be issued to the principal certifying agent.

The opinions expressed in this report by the author have been provided within the capacity of a Consulting Arborist. Any further explanation or details can be provided by contacting the author.

Assessed and Prepared by Geoff Beisler
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10.0 Appendix A- Terminology Defined

Height

Is a measure of the vertical distance from the average ground level around the root crown to the top surface of the crown, and on palms - to the apical growth point.

DBH

Diameter at Breast Height – being the stem diameter in meters, measured at 1.4m from ground level, including the thickness of the bark.; Mult. refers to multiple stems, that is in excess of 4 stems.

Crown Spread

A two-dimension linear measurement (in metres) of the crown plan. The first figure is the north-south span, the second being the east-west measurement.

Age

Is the estimate of the specimen's age based upon the expected lifespan of the species. This is divided into three stages.

Young (Y)	Trees less than 20% of life expectancy.
Mature (M)	Trees aged between 20% to 80% life expectancy.
Over-mature (O)	Trees aged over 80% of life expectancy with probable symptoms of senescence.

Crown Aspect

In relation to the root crown, 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).

Vitality Rating

Is a rating of the health of the tree, irrespective and independent of the structural integrity, and defined by the 'ability for a tree to sustain its life processes' ((Draper, Richards, 2009). This is divided between three variables, and based on the assessment of symptoms including, but not limited to; leaf size, colour, crown density, woundwood development, adaptive growth formation, and epicormic growth.

A: Normal vitality, typical for the species

B: Below average vitality, possibly temporary loss of health, partial symptoms.

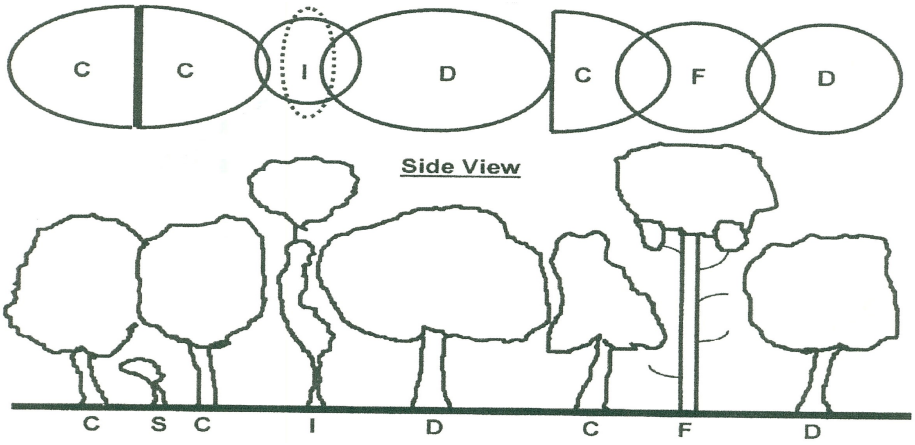
C: Poor vitality; obvious decline, potentially irreversible

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 (usually excurrent) 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.

Top View



D C, I & S, and side view, after (Matheny, N. & Clark, J. R. 1998, Trees Development, Published by International Society of Arboriculture, P.O. Box 3129, Champaign IL 61826-3129 USA, p.20, adapted from the Hazard Tree Assessment Program, Recreation and Park Department, City of San Francisco, California).

Levels of assessment

Level 1: Limited visual: a visual tree assessment to manage large populations of trees within a limited period and in order to identify obvious faults which would be considered imminent.

Level 2: Basic assessment: a standard performed assessment providing for a detailed visual assessment including all parts of the tree and surrounding environment and via the use of simple tools.

Level 3: Advanced assessment: specific type assessments conducted by either arborist who specialise with specific areas of assessment or via the use of specialised equipment. For example, aerial assessment by use of an EWP or rope/harness, or decay detection equipment.

TPZ; Tree Protection Zone

Is an area of protection required for maintaining the trees vitality and long-term viability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

The size of the Tree Protection Zone (TPZ) has been calculated from the *Australian Standard, 4970; 2009* – Protection of Trees on Development Sites

The TPZ does not provide the limit of root extension, however, offers an area of the root zone that requires predominate protection from development works. The allocated TPZ can be modified by some circumstances; however will require compensation equivalent to the area loss, elsewhere and adjacent to the TPZ.

SRZ; Structural Root Zone

Is the area around the tree containing the woody roots necessary for stability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

Protection Measures

These are required for the protection of trees during demolition/construction activities.
Protective barriers are required to be installed before the initiation of demolition and/or construction and are to be maintained up to the time of landscaping. Samples of the recommended protection measures are illustrated in Appendix B.

All other definitions are referenced from;

Draper D.B., Richards P.A., 2009, Dictionary for Managing Trees in Urban Environments
CSIRO Pub., Australia

Significance Rating, Significance of a Tree Assessment Rating System (S.T.A.R.S), IACA, 2010[10]

Tree Significance – Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vitality;
- 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 vitality;
- 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 vitality;
- 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,

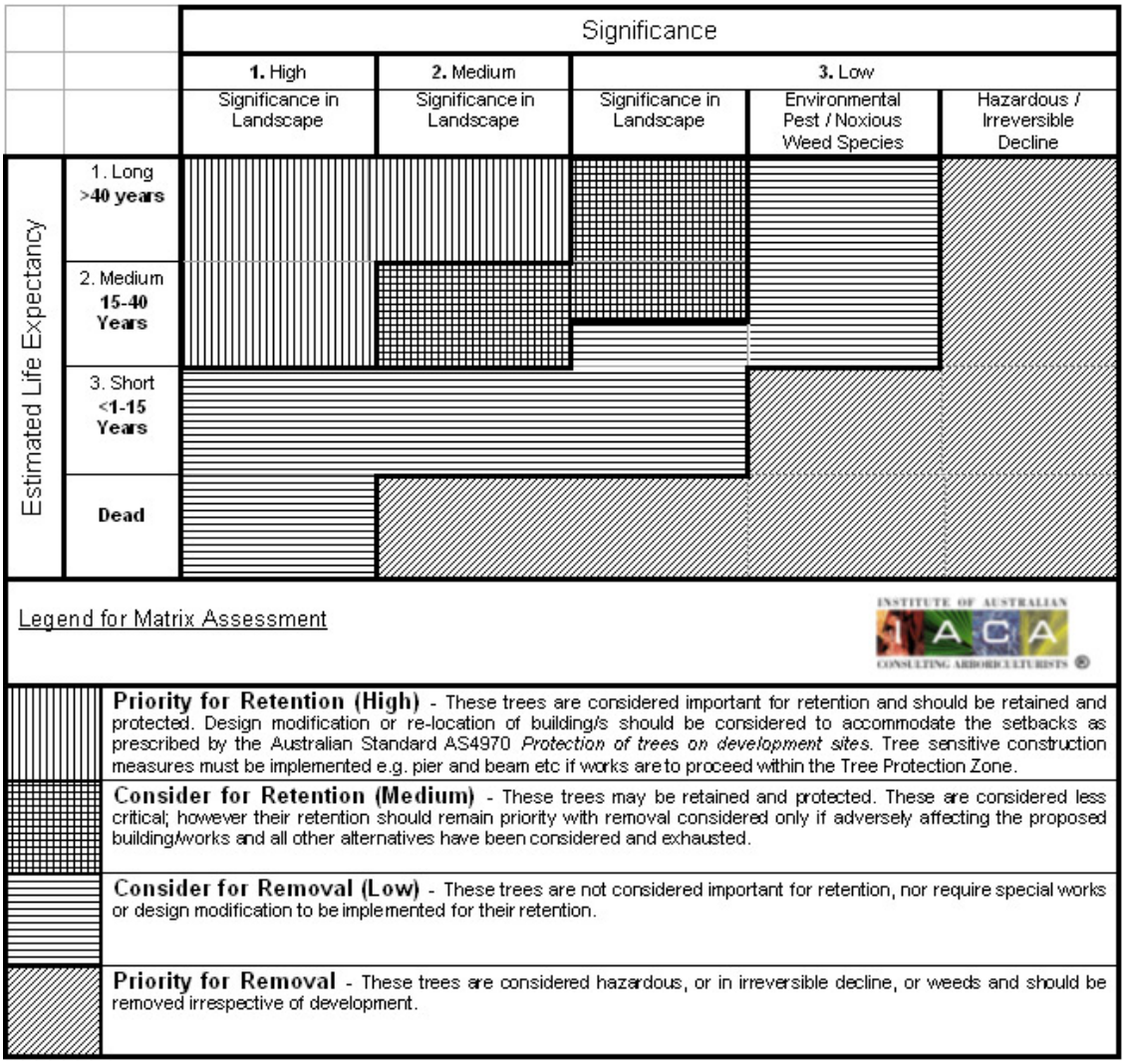
[10] IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

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.

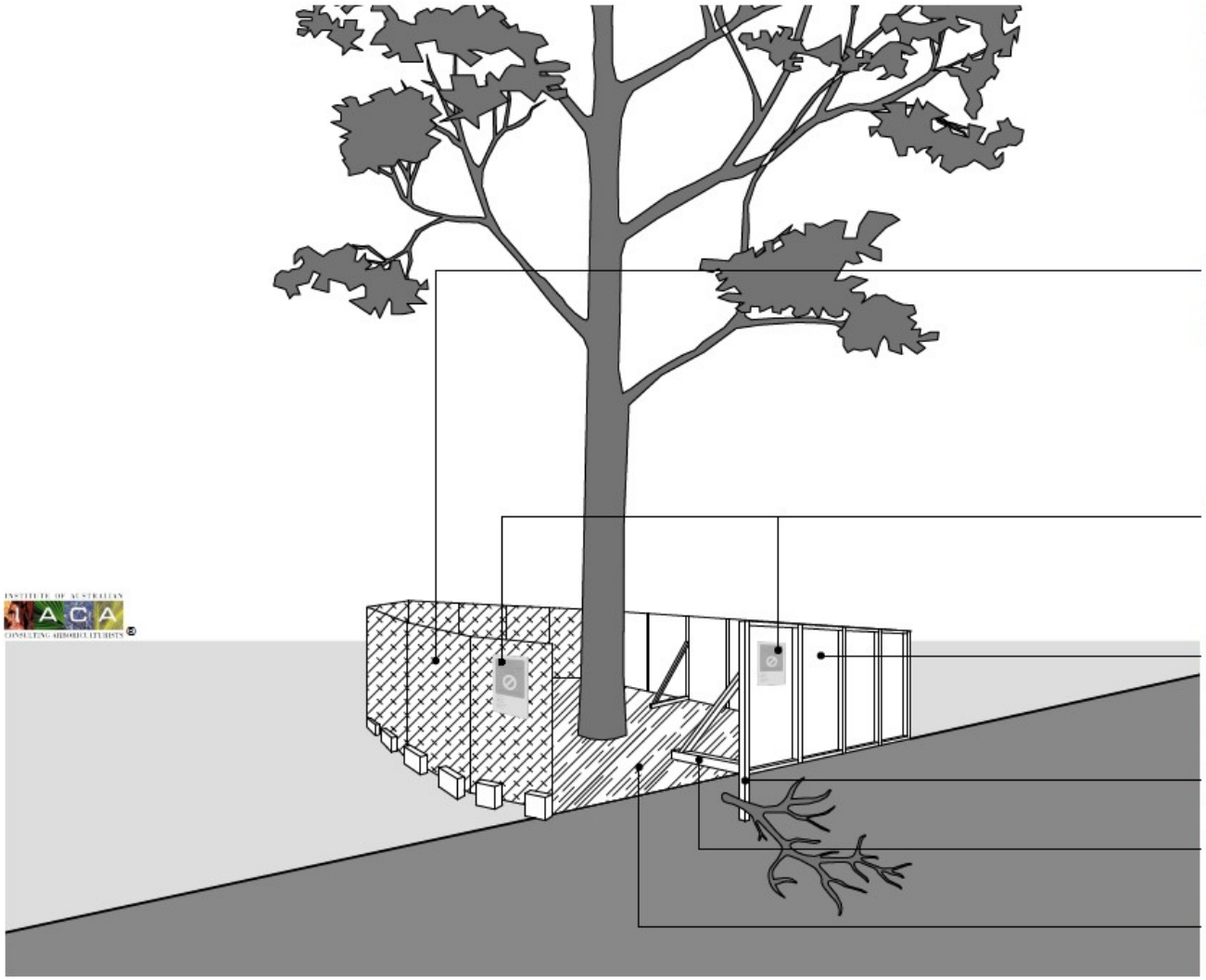
Table 3; Tree Retention Value – Priority Matrix.



Safe Useful Life Expectancy – S.U.L.E (Barell 1995)

	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 an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 – 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 – 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years.	Trees which 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 more years.	Dead, dying, suppressed or declining trees through 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 may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability on recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in heights
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned 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 tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	
G				Trees that will become dangerous after removal of other trees for reasons given in (A) to (F).	

Appendix B- Protection measures;
Protective fence



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

Option 1 - Fencing
1.8m high chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet.

Tree Protection Zone (TPZ) sign

Option 2 - Fencing
Plywood or wooden panel paling fence. This type of fencing material also prevents building materials or soil entering the TPZ.

Installation of supports should avoid damaging roots.

Bracing is permissible within the TPZ.

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

Stem and Ground protection