NSW trees
Arboricultural Consultants
ABN: 41 063 751 928

Phone: 9785 4591 Mobile: 0419 71 71 70 PO Box 534, PANANIA NSW 2213
info@nswtrees.com www.nswtreeservices.com.au

ARBORICULTURAL IMPACT ASSESSMENT

Robert Chidiac
22 Nicoll Street,
Roselands

Report Reference: AIA – CHI 05/22

4th May, 2022

Prepared by:

Sam Allouche

Diploma of Arboriculture (AQF Level 5)

Cert IV in Horticulture (Arboriculture)

Member of Arboriculture Australia | Member of International Society of Arboriculture

Table of Contents

1.0 Introduction & Overview

I. This Arboricultural Impact Assessment (AIA) was commissioned by Robert Chidiac , property owner of 22 Nicoll Street, Roselands, for the assessment of all trees potentially impacted by the redevelopment of the site.

II. The proposal involves the demolition of existing structures and construction of an attached duplex, renewed landscape and stormwater.

III. The Arborist has identified a total of twenty (20) trees , tabled as T1-T19, with the inclusion of T16A. including site and neighbouring trees , whose Tree Protection Zones (TPZ) extends into the clients site. The trees are assessed as per the Australian *Standard- Protection of trees on development* sites (AS 4970:2009).

IV. The site is planted with a variety of trees, that are somewhat suppressed from the overcrowding of canopies from both site trees an adjacent canopies from neighbouring trees. Due to the nature of the development which requires cuts and increased density of buildings ,the loss of trees is inevitable as part of this proposal. Whilst the majority of trees have been assigned lower retention values, based on current form ,condition and/or species, those trees that are viable on site have been determined to be challenging to retain given the required TPZ's mandated to ensure the trees remain viable, which imposes limitations on the developable area.

V. The Arborist focus was then to protect neighbouring and street trees , and has made recommendations for T1, T2, T11, T13 , T17 and T18 be protected with viable construction methods to be implemented as part of the proposal.

VI. This AIA is to be submitted to Canterbury Bankstown Council for final determination of trees to be made.

2.0 Methodology

I. A Visual Tree Assessment (VTA) was conducted from the clients site only, at ground level only, on 15th April, 2022.

II. Advanced assessment by means of sounding decay, subterranean investigation, or canopy inspections were not undertaken at the time, nor warranted.

III. Tree species are identified by fruit and foliage scent only, with no formal testing undertaken.

IV. All dimensions are estimated by diameter tape or by eyesight.

V. The Arborist used the survey to identify trees, and wher trees are not plotted on survey, he has estimated their location using survey refence points.

VI. Neighbouring trees are observed from the clients site only and therefore information may be limited.

VII. The Arborist tables the following in 3.2 Tree Observations -Table 1 - Tree Assessment & Impacts Evaluation;

a. Genus & species, Common name, age, and condition.

b. An appraisal of trees with reference to Tree AZ; determination of the worthiness of trees in the planning process, and a value for retention on the site where development occurs. (Refer to Appendix for further clarification of all scales and values)

c. Calculation of Tree Protection Zones (TPZ) and Structural Root Zones (SRZ), proposed setbacks to works and degree of incursion characterised by minor, moderate, major or no impact to trees.

VIII. Findings in Table 1.0 are to be read in conjunction with Notes in Appendix.

IX. Calculations of impacts are undertaken by using an interactive calculator. (Treetec, 2014).

X. A Site Plan is included in Appendix, using plans provided by the client, and overlaid by the Arborist, to annotate tree location only.

XI. A Glossary of terms is provided in the Appendix of this report, for clarification of Arboricultural terms and meanings.

XII. Photographs for this report was taken by the Arborist, using an IPhone 11Pro.Some pictures may have been cropped and superimposed for reference

XIII. The following documentation was used as part of this assessment;

Plan Type/Document	Provided by	Reference	Date
Survey	Revolution Surveys	Dwg: 7341/1 Sheet 1 of 1	25.11.2020
Existing /Demolition Plan	Tailored House Designs	Project No. 2202 Dwg A002 Rev 2	27.03.2022
Proposed Site/Roof Plan	Tailored House Designs	Project No. 2202 Dwg A005 Rev 2	27.03.2022
Sections (1 of 3)	Tailored House Designs	Project No. 2202 Dwg A200 Rev 2	27.03.2022
Section (2 of 2)	Tailored House Designs	Project No. 2202 Dwg A201 Rev 2	27.03.2022
Elevations (1of 2)	Tailored House Designs	Project No. 2202 Dwg A300 Rev 2	27.03.2022
Elevations (2 of 3)	Tailored House Designs	Project No. 2202 Dwg A300 Rev 2	27.03.2022

3.0 Observations

3.1 Site Observations

I. The site is referred to as Lot 9 Sec 6 in DP 4494 of Canterbury Bankstown Council and zoned R3 - Medium Density Residential.

II. The site is an irregular allotment, predominately facing south west.

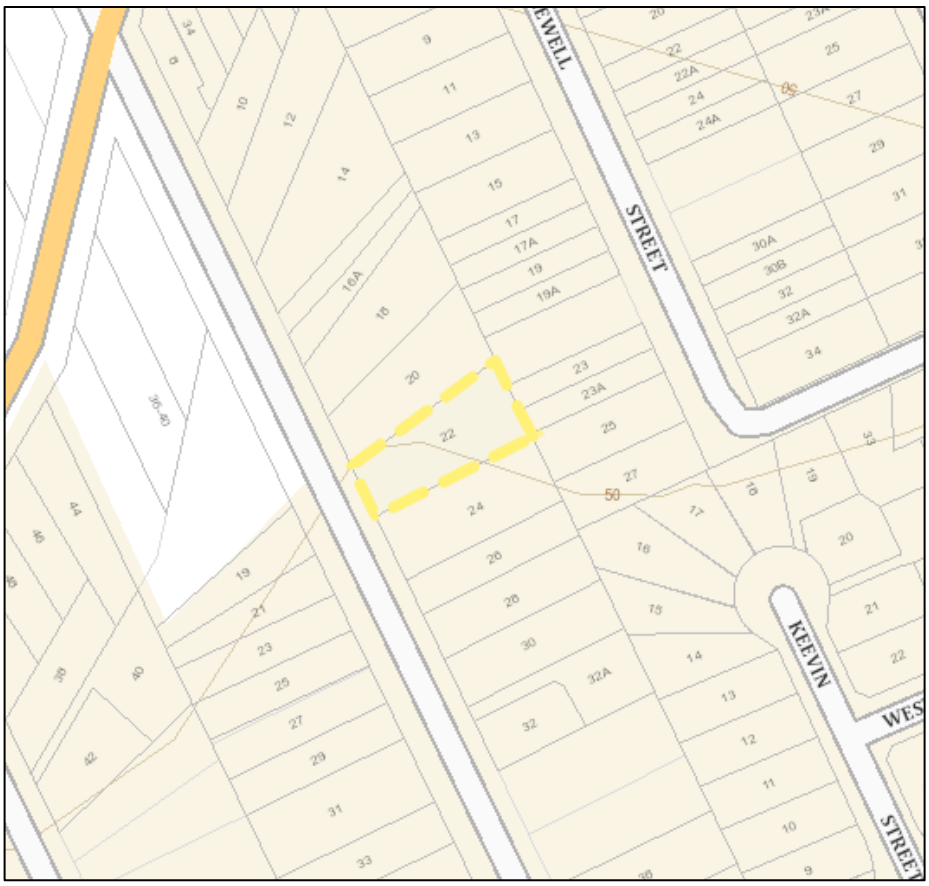


Figure 1: NSW Planning Portal Map

III. The site accommodates a freestanding clad dwelling, with detached garage.

IV. The grounds rise from street level to the rear of the site by approx.. 2m+.

V. Site soil Is not formally tested, but Espade Web mapping indicating the site, and neighbouring site, contains Blacktown soil landscape, consisting of "Wianamatta Group– Ashfield Shale consisting of laminite and dark grey siltstone and Bringelly Shale which consists of shale, with occasional calcareous claystone, laminite and coal. 24 This unit is occasionally underlain by claystone and laminite lenses within the Hawkesbury Sandstone such as at Duffys Forest.." (State of New South Wales - Department of Planning, Industry and Environment 2020).

VI. Map below , courtesy of NSW Planning Portal. Aerial image, courtesy of SixMaps.

Figure 2: SixMaps aerial imagery

3.2 Tree Data and Impact Assessment Summary

#	Genus Species	Common Name	Height (m)	Spread (m)	Age	Condition	TREEAZ	Retention Value	DBH (mm)	DAB (mm)	TPZ (m)	SRZ (m)	Impacts/ Incursion % Nil / Low / Major / Total Loss (TL / Exempt	Comments and Impact Summary
1	*Callistemon viminalis*	Bottle brush	6	7	M	F	A2	M	350x3	600	7.32	2.67	0	Street tree. Plans show tree is likely not impacted as the new crossover and driveway will emulate the existing.
2	*Callistemon viminalis*	Bottle brush	4.5	6	M	F	A2	M	150x2	300	2.52	2.30	0	Street tree. Plans suggest new crossover is outside the TPZ of tree, with no direct impact.
3	*Callistemon viminalis*	Bottle brush	5+	5	M	F	Z7	M	170x3	350	3.48	2.13	TL	Street tree. Plans suggest new crossover to northern unit will mean tree is totally consumed.
4	*Cedrus deodar*	Himalayan Cedar	7	8	M	F	Z10	L	300	380	3.6	2.2	10%+	Site tree. Plans show minimal incursion, which is likely already pre-existing from dwelling. Grading of the front stack could impose major impact.
5	*Nerium oleander*	Oleander	6+	7	M	F	Z3	L	500	600	6.0	2.67	TL	Site tree. Total loss for cutting of site soil.
6	*Lagerstroemia indica*	Crepe myrtle	6+	9	M	F	Z10	L	400	500	4.8	2.47	TL	Site tree. Sheltered under T4 Tree totally consumed for secondary dwelling
7	*Acer palmatum*	Japanese maple	5+	5	M	F	Z10	L	130 180	280	2.64	1.94	TL	Site tree. Suppressed

#	Genus Species	Common Name	Height (m)	Spread (m)	Age	Condition	TREEAZ	Retention Value	DBH (mm)	DAB (mm)	TPZ (m)	SRZ (m)	Impacts/ Incursion % Nil / Low / Major / Total Loss (TL / Exempt	Comments and Impact Summary
														Tree totally consumed building footprint.
8	*Harpephyllum caffrum*	Kaffir plum	6+	8	M	F	Z3	L	450	400	5.4	2.25	TL	Site tree. Tree totally consumed building footprint.
9	*Melaleuca decora*	White feather honey myrtle	14	12	M	G	Z7	M	840	920	10.08	3.2	TL	Site tree. Tree totally consumed building footprint
10	*Waterhousia floribunda*	Weeping lily pilly	12	14	M	F	Z7	M	400x4 500	1000	11.28	3.31	TL	Site tree. Tree totally consumed building footprint
11	*Cupressus torulosa*	Bhutan cypress	13	7	M	-	A2	M	450	520	5.4	2.51	17.53%	Neighbours tree on 20 Nicoll Street.. Tree totally consumed building footprint
12	*Eucalyptus punctata*	Grey gum	18	16	M	P	Z10	M	800	1000	9.6	3.31	TL	Site tree. Tree totally consumed building footprint
13	*Fucis sp*	Fig	15	14	M	-	A2	M	900	900	10.8	3.17	9.42	Neighbours tree on 20 Nicoll Street.. Incursions from both secondary dwellings and soil cuts, but still below the 10% threshold.
14	*Waterhousia floribunda*	Weeping lily pilly	6	5	M	F	Z10	L	180	220	2.16	1.75	TL	Site tree. Suppressed Tree totally consumed building footprint.
15	*Waterhousia floribunda*	Weeping lily pilly	7	5	M	F	Z10	M	120	170	2.0	1.57	TL	Site tree. Tree totally consumed building footprint.

#	Genus Species	Common Name	Height (m)	Spread (m)	Age	Condition	TREEAZ	Retention Value	DBH (mm)	DAB (mm)	TPZ (m)	SRZ (m)	Impacts/ Incursion % Nil / Low / Major / Total Loss (TL / Exempt	Comments and Impact Summary
16	*Erythrina x sykesii*	Coral	13	14	M	F	Z3	L	550x3	1000	11.4	3.31	TL	Site tree. Tree totally consumed building footprint. Exempt under CDCP2014
16 A	*Erythrina x sykesii*	Coral	13	14	M	F	Z3	L	900	900	10.8	3.17	TL	Site tree. Tree totally consumed building footprint. Exempt under CDCP2014
17	*Erythrina crista galli*	Cockspur coral	13	16	M	F	A2	M	950	950	11.4	3.24	25.03%	Neighbours tree on 23 Ridgewell Street. Incursions from both secondary dwellings, exceeding the 10% threshold and major. SRZ not impacted.
18	*Waterhousia floribunda*	Weeping lily pilly	12	10	M	F	A2	M	700	750	8.4	2.93	20.57	Neighbours tree on 23 Ridgewell Street Incursions from both secondary dwellings , exceeding the 10% threshold and major. SRZ not impacted.
19	*Gordonia axillaris*	Fried eggplant tree	6	7	M	F	Z10	L	240 160x2	350	3.96	2.13	TL	Site tree. Tree totally consumed building footprint.

4.0 Indirect Impacts

The following are indirect impacts that trees may succumb to during construction related activities. It is imperative that these be taken into consideration and all attempts made to minimise indirect impacts, as they can occur over the duration of construction and indeed accumulate to have significant effect on trees longevity.

I. *Mechanical damage from plant/machinery*; Direct wounding and damage of stems and branches by large plant & machinery, including excavator, bob cat, crane, etc., during construction activities will have some impact in the form of cambium damage/abrasion to tree trunks and branch tearing well into collar attachments in turn exposing live woody tissue and predisposing the tree to pest and disease. Similarly, plant/machinery is also responsible for soil compaction within the trees TPZ.

II. *Indirect root injury from soil compaction*; When soil is compacted either via building materials/debris stockpiled on the TPZ or TPZ is utilised as a thoroughfare for heavy plant and machinery, the soil inevitable becomes compacted and impacts on the air and moisture uptake and ultimately affecting the gaseous exchange within the drip line that is vital for the trees health and longevity.

III. *Soil contamination;* where chemicals, cement, and paint products etc., get washed or spilled into the soil and the tree absorbs the soluble content through its roots in addition lime from cement wash off can alter the soil PH

IV. *Soil grade changes;* when the top soil cover down to a depth of approximately 150mm is striped it can illuminate vital feeder roots and can temporarily shock the tree. This process is common particularly during the landscape process. In addition, these fine roots if exposed can prematurely dehydrate and die

V. *Landscaping Impact*; Side paths and driveways comprised of concrete and non-porous materials can deprive roots of air and water and affect gaseous exchange. This is particularly true when there has been lack of consideration for trees located on adjacent properties and within close proximity to building envelope. In addition, masonry fence lines require sub grade footings and usually at the expense of root loss of nearby trees. Furthermore, there can be an increase in reflected heat to the remaining trees as a result from surrounding hard surfaces.

5.0 Discussion & Conclusion

I. The Arborist notes that the site has been evidently planted with trees lining boundaries , characteristic of previous landscape themes, with some large native trees as well. Overall the trees on site are unmaintained and their condition reflects this somewhat.

II. The site is also encapsulated by other large trees on neighbouring sites, being 20 Nicoll Street and 23 Ridgewell Street.

III. Preliminary advice provided by the Arborist reinforced that the majority of site trees had either developed poor form and /or condition and not worthy of design constraints, with T5 considered a toxic tree. Some trees are suppressed, mainly due to the overcrowding of canopies. The three better specimens on site are T9, T10 and T12, with the former two the most viable trees on the site, and latter being a large Eucalypt , but in poor condition. Both T16 and T16A are exempt species under CDCP2014.

IV. The Impacts Assessment , in accordance with AS4970:2009, notes the overwhelming majority of site trees, that being T5-T12, T14-T16 and T19 are totally consumed by the building footprint , from primary or secondary dwellings. For the street tree T3, this is in the way of the driveway for the northern unit and is also proposed for removal.

V. Indeed, it is only T4 that plans suggest can be retained and although the Tree Protection Plan demonstrates the tree is free from major encroachment from buildings and driveways, the Arborist notes that the front set back is going to be graded , and of which would be detrimental to the tree. The other issue being this tree is not in optimum condition with the swept trunk, and not a high retention value tree.

VI. With the exception of T3, T9 and T10, the other trees in this cohort would all be supported for removal to accommodate for the development based on their lower retention value.

VII. In the case of T3 being the street tree, whilst considered a viable tree , the Arborist notes that this type of development requires dual access and would require the removal of *either* T2 or T3 in this scenario, given that there are two street trees planted fairly closely on the verge. The removal of T3 is therefore supported only to accommodate the second crossover and driveway. T1 and T2 are subject to indirect impacts only, given that the existing crossover will be emulated and , therefore impacts *can* be managed.

VIII. For T9 and T10, the Arborist states that their mandated exclusion zone would require a large area of the site to remain undeveloped, and more so, the site grounds would have to be unmodified, which would be challenging given site topography.

IX. The consideration to remove a tree that is otherwise viable, is not taken lightly. Whilst the Arborist cannot make judgements on site usage, he does note that trees can often

impose limitations on the developable area. In this case, the site topography, configuration, and location of the tree, *limits* the developable area and how it is designed for functional use.

X. Where T9 and T10 would otherwise be assigned an A2 Classification under TreeAZ, the Arborist has assigned it a Z7, " [trees] with …intolerable inconvenience ", where inconvenience is the "interference with the authorised use of land." Whilst it is agreed that trees are beneficial to the community and landscape, they can pose *some* level of inconvenience to landowners, the extent to which this is acceptable is another matter. In this case this trees interfere with the landowner's ability to utilise the land, and whether this is reasonable or acceptable is as Barrell suggests in TreeAZ "often a matter of judgement for each specific situation, tempered by experience and common sense". (Barrell, 2010).

XI. The Arborists focus was then on the impacts to neighbouring trees T11, T13, T17 and T18. Primarily the SRZs are all free of encroachments and tree stability should not be compromised. The Impact Summary suggests that all three trees have major incursions that could potentially affect the viability of trees unless the incursions are reduced by use of viable construction methods. It is noted that the portion of the TPZ of these trees, within the clients yard, will *not* be graded as soil cuts cease shortly after the duplex and before the secondary dwellings. The secondary dwellings however are located within the TPZ of such trees and their construction would have to be conditioned in order for such trees to remain viable.

6.0 Recommendations

I. The Arborist supports the removal of al site trees, that being T4- T10, T12, T14-T16 and T19. Where tree removal is approved, it must be undertaken in accordance with Code of Practice , Amenity Tree Industry 1998, Workcover NSW.

II. The Arborist also supports the removal of T3, but notes that as a Council asset, Canterbury Bankstown Council may condition its removal.

III. The Arborist recommends that T1, T2, T11, T13 , T17 and T18 be protected , with the proposal to incorporate the following;

a. Any renewal of the existing southern crossover near T1 must be done meticulously, under the supervision of the Project Arborist.
b. The soil cuts behind the primary dwellings must not occur in the TPZs of T11, T13 , T17 and T18.
c. The secondary dwellings are to be built above grade, with no trench footings, and on pier and beam foundations, allowing for voids under slabs.
d. Pier holes in the TPZ of trees are to be hand dug , under the direct supervision of the Project Arborist.

e. Where soil cuts are approved within the TPZ it is anticipated underlying tree roots will be cut. Such roots, greater than 25mm, must be blocked , by use of clean cut, sterilised tools , that will ensure rapid compartmentalisation (forming walls that protect the wound area from decay) denying the entry of fungal pathogens. Ground soil/root treatment within the TPZ is crucial in this vicinity.
f. Piers are to be lined with a Geotech fabric , prior to concrete pour, to act as an interface between concrete and soil.
g. Existing soil levels within the TPZ radius of the trees shall remain intact..
h. Any pavement outside of the secondary dwellings, for walkways , must be above grade and porous.
i. Any renewal of the boundary fence must use existing post holes , with no *further* ground intrusion in the SRZ/TPZ of trees.

7.0 Tree Protection Measures (AS4970:2009)

I. A Project Arborist with a minimum AQF level 5 is to be engaged to oversee critical stages of works near trees and provide certification at the following hold points:
   a. Compliance that Tree Protection Measures have been installed and maintained, including fencing, and signage.
   b. Supervision of hand excavation for piers in TPZ of tree
   c. Final inspection of trees post works and prior to OC.

II. For the protection of T1 and T2, the following must be implemented:
   a. Tree protection fencing, in accordance with AS4970:2009, must be of chain link wire and no less than 1.8 metres high and anchored down with concrete blocks/stirrups in a non-intrusive manner. For Neighbouring trees, a supplementary fence within the clients site must be placed as per the TPP on Page 15.

   b. Tree protection fencing must be covered with shade cloth tightly woven to not allow cement debris/dust to contact any lower tree parts. Fencing can be erected 1m form the boundary, and moved accordingly for works, and under guidance of the Project Arborist.

Figure 3: Tree Protection Fencing

Figure 5: Supplementary fencing against existing fences.

c. Fencing shall be signposted. with a TPZ sign. Sign must be clearly visible to warn all contractors that a TPZ has been established. Signage to read 'TREE PROTECTION ZONE': Entry not permitted without Project Arborist consultation. Sign shall A3 size and include Project Arborist details. Fencing shall remain in place until landscape works.

Figure 6: TPZ signage

d. Where fencing is removed or relocated , temporarily, the Arborist must approve first, and the side setback must be covered with spreader plates or rumble boards. This method will ensure the cover protects the ground soils and minimises soil compaction.

Figure 7: Spreader plates

e. Where roots > 25m are encountered, these must be pruned by the Project Arborist, and treated accordingly.

f. All underground services mut be installed outside the TPZ of trees, unless assessed and conditioned by the Arborist in this report , or guided by the Project Arborist on site.

g. Scaffolding should be erected outside the TPZ of trees or placed on rumble boards.

h. The following activities are excluded in the TPZ of trees, unless assessed and approved by the Arborist ; machine excavation (inc. trenching), storage/stockpiling of materials, parking of vehicles or plant, waste storage or dumping, construction waste wash-off, fill and other soil level changes, temporary or permanent installation of utilities and signage.

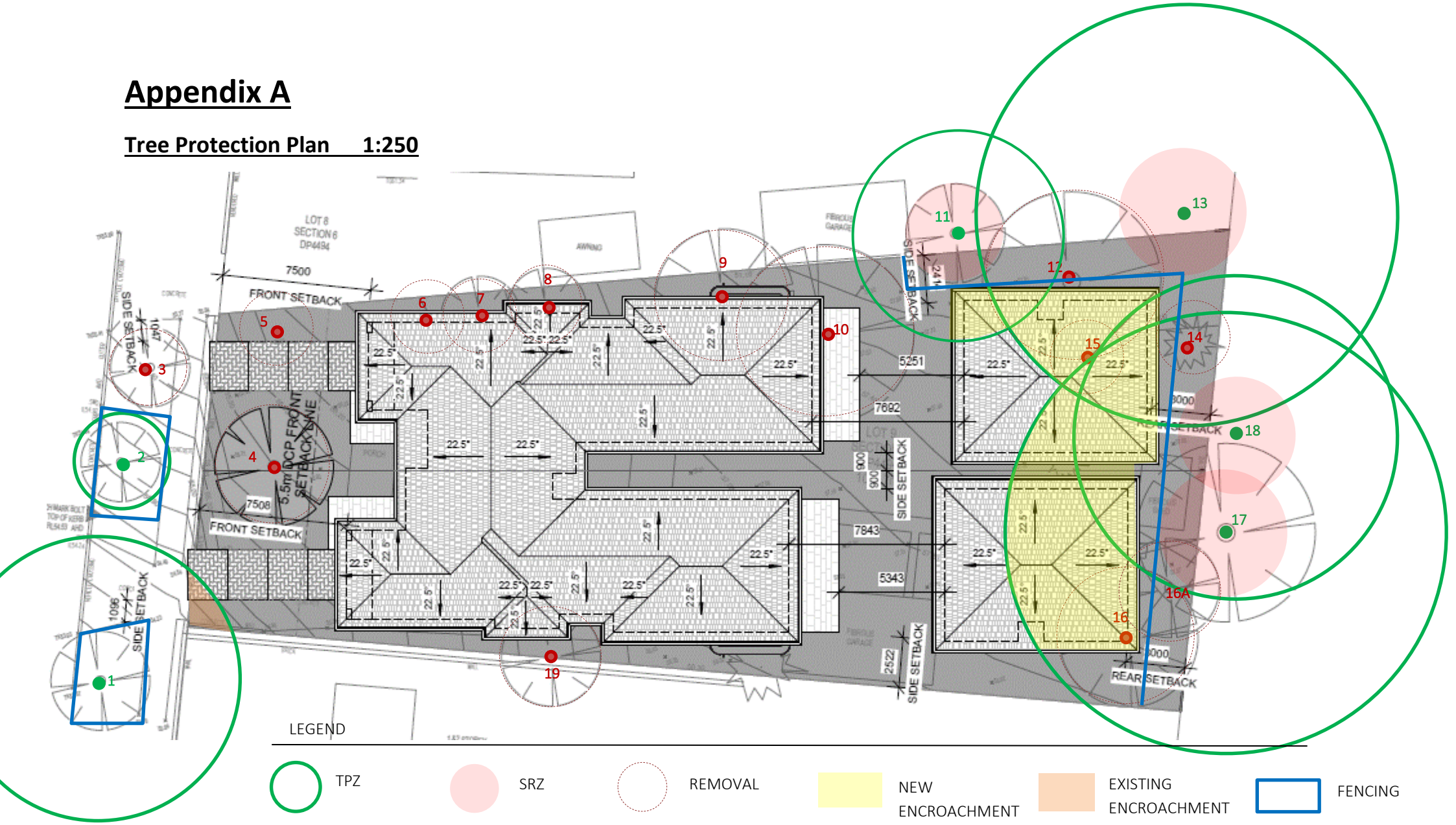
i. All Indirect Impacts, as stated in this report (Refer to 4.0), must be managed and minimised to avoid undue damage to retained trees.

Yours Faithfully,

Sam Allouche
Diploma of Arboriculture (AQF Level 5)
Cert IV in Horticulture
Arboriculture Australia (Consultant Arborist) | Member No. 1469
Member of I international Society of Arboriculture | Member No .173439

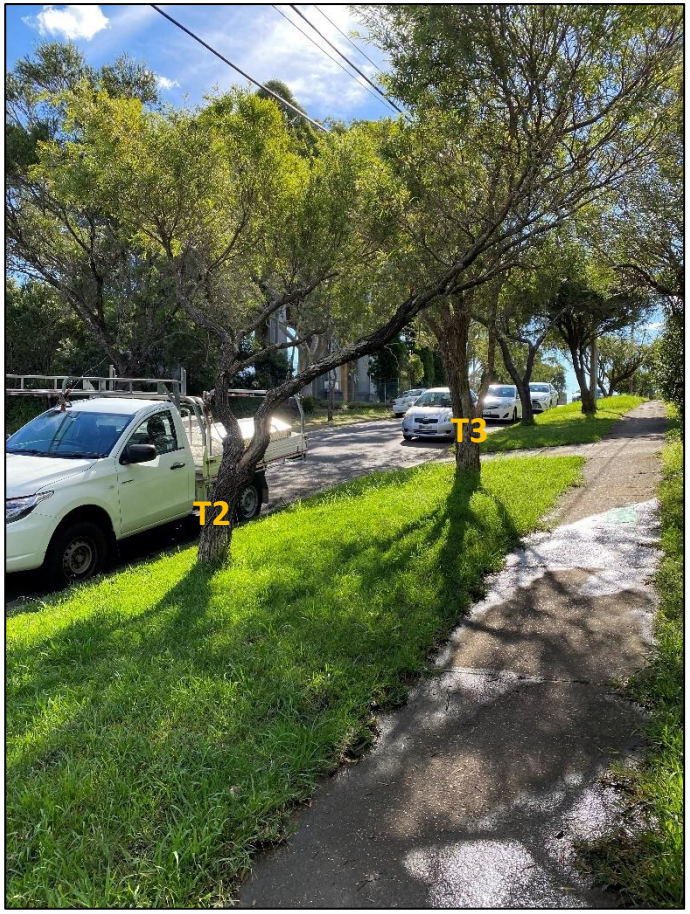
Appendix A

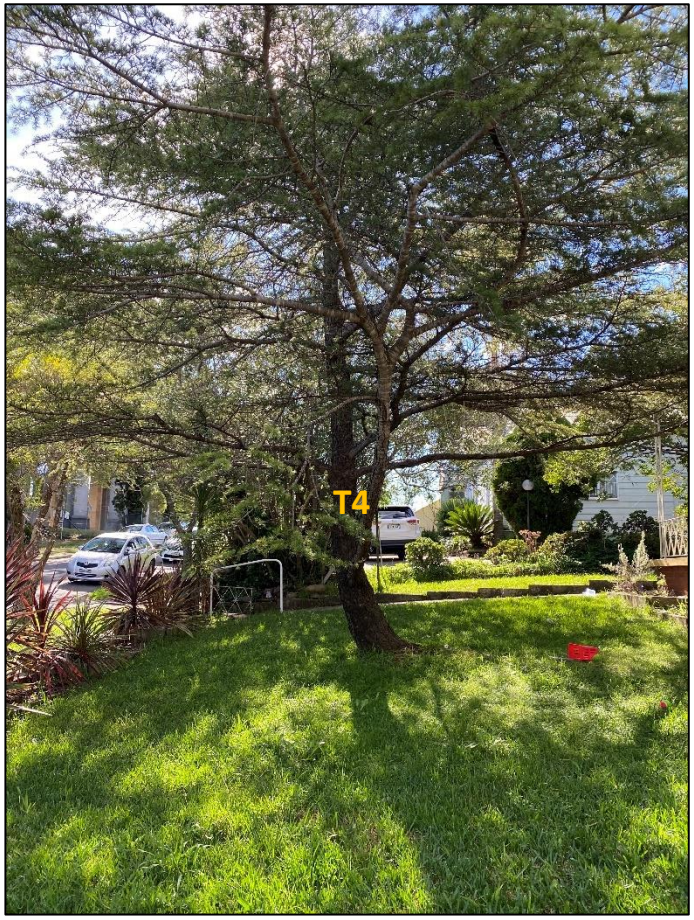
Tree Protection Plan 1:250



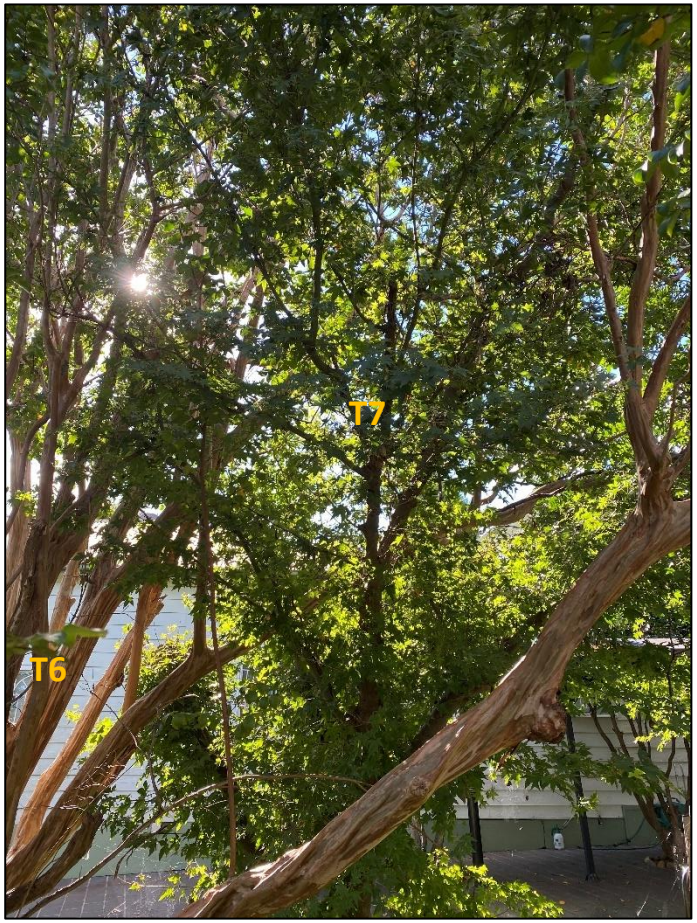
Appendix B

Photographs




T4


T5


T7
T6


T8


T9

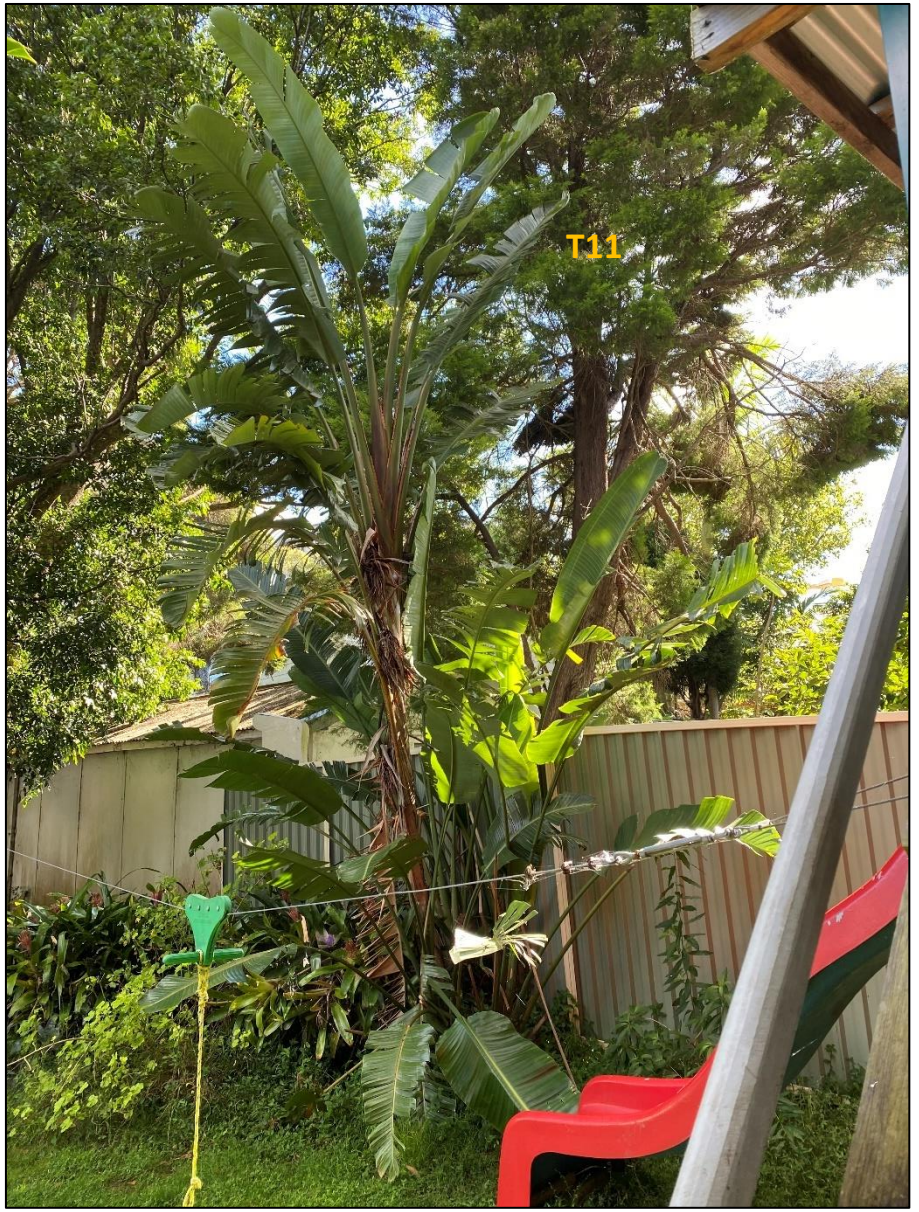
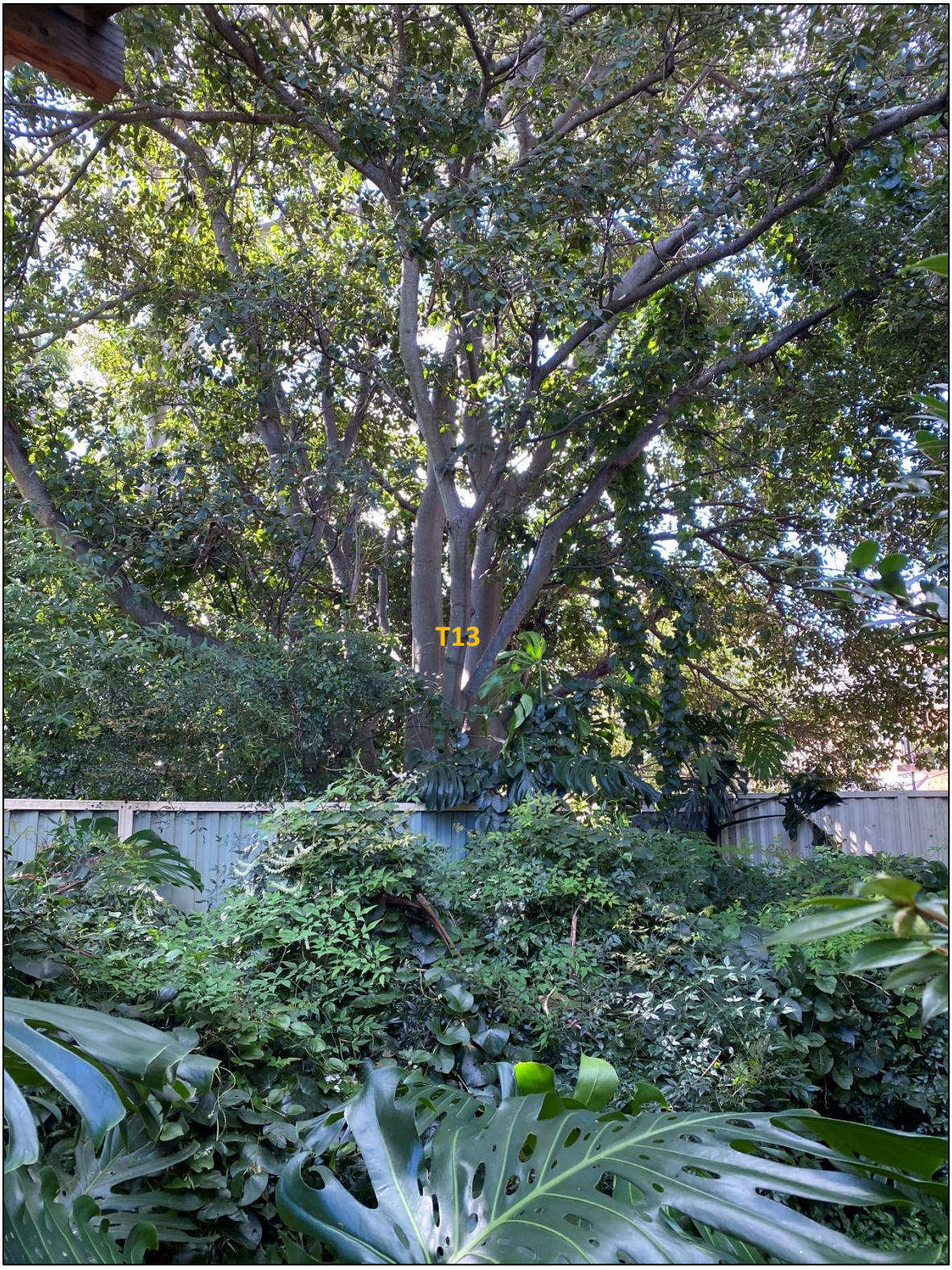


Photo 5 : T10 – T14 in location, looking south-east


T12


T13


T10
T18
T17
T16
T14
T15
T16 A


T19
KIA
CARNIVAL
CY·70·GO
NEW SOUTH WALES

Appendix C

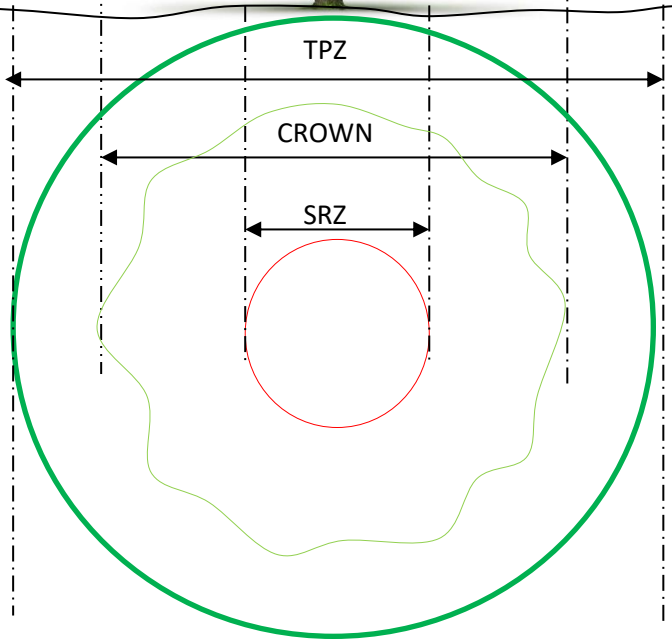
Tree Assessment & Impacts Evaluation Table Notes					
H	Height of tree (estimated)				
S	Spread of tree (estimated)				
Age	Y = Young J= Juvenile M= Mature O=Over mature S=Senescent EM = Early Mature				
Condition	G= Good F=Fair P= Poor D= Dead				
TREES AZ	Categorisation of trees with regards to development Refer to Appendix – Tree AZ				
Retention Value	H=High M=Medium L=Low R=Removal (Refer to Appendix - Significance of a Tree, Assessment Rating System (STARS)©				
DBH	Diameter at Breast Height (estimated circumference of tree at approximately 1400mm)				
DAB	Diameter at Basal				
TPZ	Calculated area above and below ground at a radial distance form centre of trunk. Exclusion zone for the protection of tree roots and crown to ensure tree viability				
SRZ	Calculated area below ground at a radial distance from centre trunk of tree, required exclusively for tree stability				
Setback	Calculated setback for proposed works from tree, measured at centre of trunk.				
Impacts/Incursion	Calculated degree of incursion				
	Nil No impact	Low 0% - 15%	Moderate 15%- 25%	Significant 25%+	Total Loss Lost to proposal
Tree data/Impacts Summary	Arborist commentary on tree location, health, structure and relationship to development.				

Appendix D

Indicative TPZ and SRZ (AS 4970/2009)

ELEVATION VIEW

PLAN VIEW



CALCULATIONS

TPZ (Radius) = DBH X 12

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

- The Australian Standards provides a formula for calculating both the TPZ and SRZ. The TPZ is a combination of both root and crown area requiring protection for viable tree retention. Basically, it is the area isolated from construction disturbances. The TPZ incorporates the SRZ, the area required for tree stability.
- It should be noted that the TPZs have been calculated with the following in mind; tree characteristics, typography of the site and the TPZ reconfiguration allowance as stated in AS 4970-2009. (Refer to Appendix E for calculation methods of TPZ.) The Standards allow 10% of the radii from one edge of the TPZ to be offset and added to another edge whilst still maintaining total surface area required for TPZ
- TPZ of palms is calculated as no greater than 1m of its radial canopy span and no SRZ is calculated.
- TPZ and SRZ estimated only and cannot be relied on as accurate with trees on neighbouring properties

Appendix E

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

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High, Medium and Low significance* in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.

Tree Significance - Assessment Criteria

1. High Significance in landscape

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

2. Medium Significance in landscape

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

3. Low Significance in landscape

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

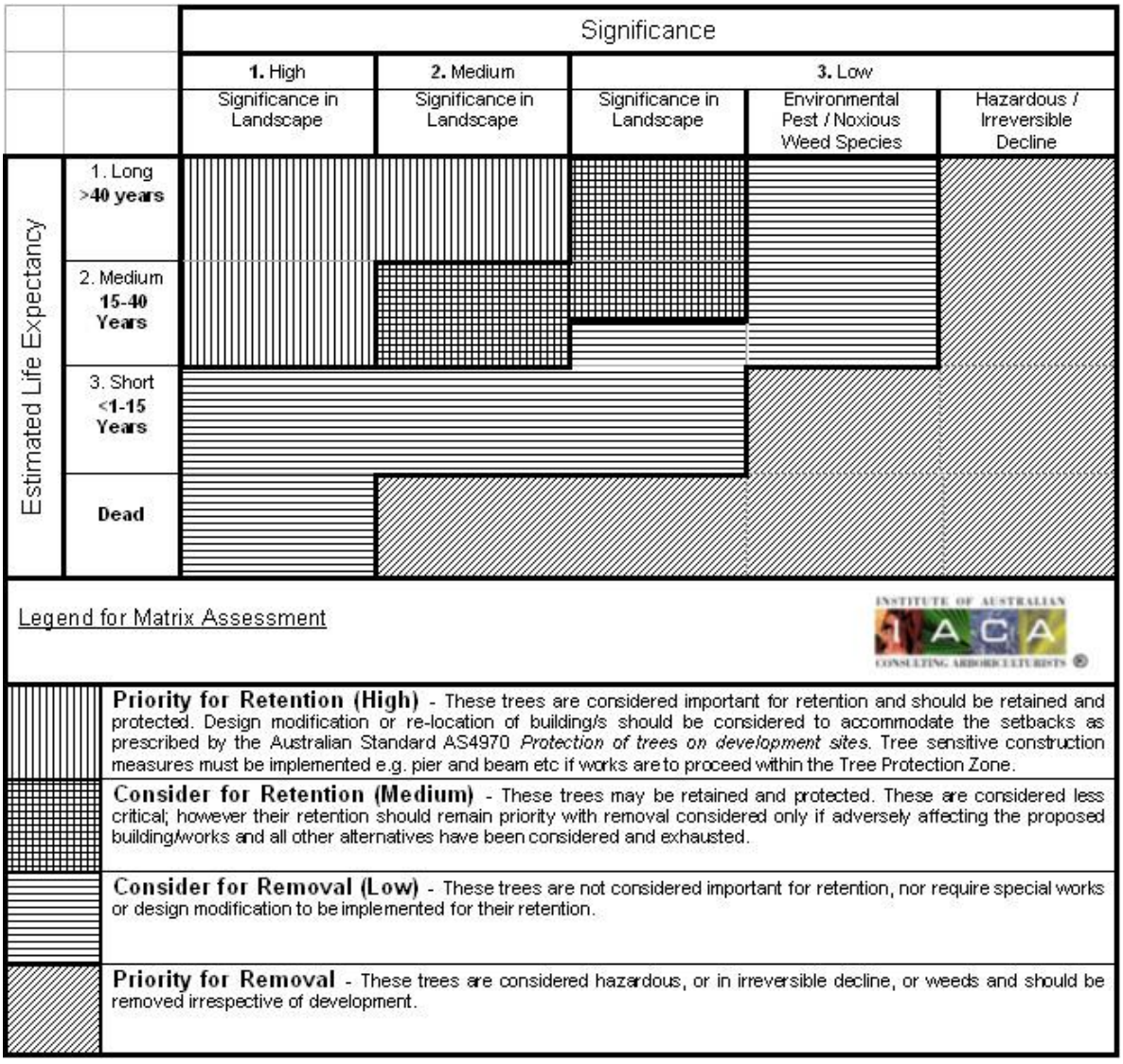
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.
  Environmental Pest / Noxious Weed Species
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.
- Hazardous/Irreversible Decline - The tree is structurally unsound and/or unstable and is considered potentially dangerous, - The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

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

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

Table 1.0 Tree Retention Value - Priority Matrix

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



Appendix F

Tree AZ Categories (Version 10.10 ANZ)

Category Z: Unimportant trees not worthy of being a material constraint

Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species

Z1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
Z2	Too close to a building, i.e. exempt from legal protection because of proximity, etc
Z3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc

High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe

Z4	Dead, dying, diseased or declining
Z5	Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
Z6	Instability, i.e. poor anchorage, increased exposure, etc

Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people

Z7	Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
Z8	Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc

Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population

Z9	Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
Z10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
Z11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
Z12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate.

Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

A1	No significant defects and could be retained with minimal remedial care
A2	Minor defects that could be addressed by remedial care and/or work to adjacent trees
A3	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
A4	Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional, or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

Appendix G

Glossary of Terms

Taken from: Draper, D. B and Richards, P.A. (2009) Dictionary for Managing Trees in Urban Environments, CSIRO Publishing, Victoria, Australia

Arborist An individual with competence to cultivate, care and maintain trees from amenity or utility purposes.

Basal Proximal end of the trunk or branch, e.g. trunk wound extending to the ground is a basal wound, or as epicormic shoots arising from lignotuber

Branch failure The structural collapse of a branch that is physically weakened by wounding or from the actions of pests and diseases or overcome by loading forces in excess of its load – bearing capacity.

Buttress A flange of adaptive wood occurring at a junction of a trunk and root or trunk and branch in response to addition loading.

Callus wood Undifferentiated and unlignified wood that forms initially after wounding around the margins of a wound separating damaged existing wood from the later forming lignified wood or wound wood.

Canker A wound created by repeated localized killing of the vascular cambium and bark by wood decay fungi and bacteria usually marked by concentric disfiguration. The wound may appear as a depression as each successive growth increment develops around the lesion forming a wound margin (Shigo 1991, p. 140)

Canopy cover The amount of area of land covered by the lateral spread of the tree canopy, when viewed from above that land.

Codominant stem Two or more first order structural branches or lower order branches of similar dimensions arising from about the same position from a truck or stem.

Crown Of an individual tree all the parts arising above the trunk where it terminates by its division forming branches, e.g. the branches, leaves, flowers and fruits; or the total amount of foliage supported by the branches.

Decline The response of the tree to a reduction of energy levels resulting from stress. Recovery from a decline is difficult and slow, and decline is usually irreversible.

Diameter at Breast Height (DBH) Measurement of a trunk width calculated at a given distance from above ground from the base of the tree often measured at 1.4m.

Dominance A tendency in a leading shoot to maintain a faster rate of apical elongation and expansion other than other nearby lateral shoots, and the tendency also for a tree to maintain a taller crown than its neighbours (Lonsdale 1999, p.313)

Dripline A line formed around the edge of a tree by the lateral extent of the crown.

Dynamic Load Loading force that is moving and changes over time, e.g. from wind movement (James 2003, p. 166)

Endemic A native plant usually with a restricted occurrence limited to a particular country, geographic region or area and often further confined to a specific habitat.

Epicormic Branch derived from an epicormic shoot

Frass The granular wood particles produced from borer insects and can be categorized as fine frass, medium frass, and coarse frass with the different types being of different sizes and caused by different insects.

Habitat tree A tree providing a niche supporting the life processes of a plant or animal

Hazard The threat of danger to people or property from a tree or tree part resulting from changes in the physical condition, growing environment, or existing physical attributes of the tree, e.g. included bark, soil erosion, or thorns or poisonous parts, respectively.

Included bark The bark on the inner side of the branch union , or in within a concave crotch that is unable to be lost from the tree and accumulates or is trapped by acutely divergent branches forming a compression fork

Indigenous A native plant usually with a broad distribution in a particular country, geographic region or area. See also Endemic, Locally indigenous and non-locally indigenous. .

In situ Occurring in its original place, e.g. soil level, remnant vegetation, the place from where a tree was transplanted, or where a tree is growing.

Irreversible decline The decline of a tree where it has progressively deteriorated to a point where no remedial works will be sufficient to prevent its demise , usually of poor form and low vigour.

Isolated tree A tree growing as a solitary specimen in an exposed location away from other trees as a result of natural or artificial causes and may be naturally occurring.

Kino The extractive polyphenols (tannins) formed in veins in a cambial zone as a defense in response to wounding in eucalypts. Often visible as an exudate when the kino veins rupture or are injured (Boland, *et al.* 2006, p. 691)

Lignotuber A woody tuber developed in the axils of the cotyledons.

Loading Weight that is carried, e.g. as bending stress on a branch.

Locally Indigenous A native plant as remnant vegetation, self-sown or planted in an area or region where it occurred originally.

Longevity Long lived, referring to a plant living for a long period of time.

Mechanical wound -Wound inflicted by abrasion, by mechanical device

Naturalised A plant introduced from another country or region to a place where it was not previously indigenous where it has escaped from agriculture or horticulture or as a garden escape and has sustained itself unassisted and given rise to successive generations of viable progeny.

Necrotic Dead area of tissue that may be localized e.g. on leaves, branches, bark or roots

Negligence With regard to trees , failure to take reasonable care to prevent hazardous situations from occurring which may result in injury to people or damage to property (Lonsdale 1999, p. 317)

Noxious weed A plant species of any taxa declared a weed by legislation. Treatment for the control or eradication of such weeds is usually prescribed by legislation...

Remnant A plant /s of any taxa and their progeny as part of the floristics of the recognised endemic ecological community remaining in a given location after alteration of the site or its modification or fragmentation by activities on that land or on adjacent land

Useful Life Expectancy (ULE) A system used to determine the time a tree can be expected to be usefully retained

Shedding - Shedding of plant organs when it is mature or aged, by the formation of a corky layer across its base. This may be influenced by stress, drought, senescence, declining condition, reduced vigour and also occurs

Stability Resistance to change especially from loading forces or physical modifications to a trees growing environment

Stress A factor in a plants environment that can have adverse impacts on its life processes e.g. altered soil conditions, root damage, toxicity, drought or water logging. The impact t of stress may be reversible given good arboricultural practices that may lead to plant decline.

Structural defect A weak point in or on a tree causing its structural deterioration diminishing its stability in full or part

Structural integrity The ability of a load bearing part of a tree, and its resistance to loading forces

Structural roots- Roots supporting the infrastructure of the root plate providing strength and stability of the tree.

Symbiotic An association between different species usually but not always mutually beneficial.

Termite leads Tunnels of mud on the stem and between the bark created by termites that may be active or inactive.

Tree Protection Zone (TPZ) A combination of RPZ and CPZ as an area around the tree set aside for the protection of a tree and a sufficient proportion of its growing environment above and below ground established prior to demolition or construction and maintained until the completion of works to allow for its viable retention including stability.

Visual Tree Assessment (VTA) A visual inspection of a tree from the ground. Such assessment should only be undertaken by suitably competent practitioners.

Disclaimer

This report has been compiled using knowledge & expertise relating to trees, and makes recommendations based on this. It should be noted that trees are affected by many elements, environmental and situational, some of which cannot be predicted or foreseen even by Qualified Arborists.

The client when reading this report should take the following factors into consideration;

- It is not feasible to assume that Arborists identify all hazards or risks associated with trees at the time of consultation or indeed in this report.
- This Assessment is valid for 3 months from the date stipulated on the report, and may need to be updated after this.
- Regular maintenance and monitoring by a Qualified Arborist will minimize the risks associated with tree and contribute to its longevity in its growing environment, however there is no guarantee that all risks are to be eliminated and that the tree is not privy to external factors that will impact on the tree after it has been assessed by our service.
- The report is compiled in good faith, where any information given to our service is correct and true, and where interested parties and /or stakeholders are notified. This includes title and ownership of property, orders as directed by relevant authorities, development application determinations and other matters that affect the tree/s in question.
- The Arborist shall not be required to give testimony or to attend court by reason of this report unless other arrangements are made prior.
- This Arborist Report does not issue permission for any recommendations made in this report, particularly where trees are to be removed. Permission must be sought and obtained from Council and owner/s of trees.
- Any treatments recommended by the Arborist cannot be guaranteed, due to the volatile environment in which trees are growing.
- Clients may choose to accept or disregard the recommendations of the Arborist, or to seek additional advice.
- This report is intended for the Recipient, no part of this report is to be copied or altered without the authors permission

Bibliography

- Australian Standards, 2009. *"Protection of Trees on Development Sites",* (AS 4970-2009) Standards Australia, Sydney, Australia.
- Australian Standards, 2007. *"Pruning of Amenity Trees",* (AS 4373/2007) Standards Australia, Sydney, Australia
- Barrell, J.D., (2009) TreeAZ. Detailed guidance on its use. Vesion 10.10 – ANZ. United Kingdon
- Botanica (2001), Trees & Shrubs, Random House, Australia
- Cronin, L. (2002), Australian Trees, 2nd edition, Envirobook, Australia
- Draper, D. B and Richards, P.A. (2009), Dictionary for Managing Trees in Urban Environments, CSIRO Publishing, Victoria, Australia
- Environmental Protection & Biodiversity Conservation Act 1999 (Commonwealth Government) http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/
- Footprint Green Pty Ltd. 2001, *Footprint Green Tree Significance & Retention Value Matrix* , Avalon, NSW Australia, www.footprintgreen.com.au
- Holliday, I. ,and Watton, G. (2002) Gardeners Companion to Eucalypts 4th revised Edition Reed New Holland, Australia
- IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au
- Matheny, N. & Clark, J (1994). A Photographic guide to Hazard Trees in Urban Areas. 2nd Edition. Illinois, (USA).
- Matheny, N. & Clark, J (1998). Trees & Development, A technical Guide to Preservation of Trees during Land Development. International Society of Arboriculture, Champaign, USA.
- Matheny, N. & Clark, J (2004), Arboriculture. Fourth Edition. Pearson Education Incorporated. New Jersey, USA.
- Mattheck, C. (1999). Body Language of trees. Forschungszentrum Karlruhe, Germany
- State of New South Wales (Department of Planning, Industry and Environment, 2020) www.eSPADE v2.1 nsw.gov.au).
- Treetec (2014) www.treetec.net.au . Melbourne, Australia