



TREE MANAGEMENT CONSULTING ARBORICULTURISTS

ARBORICULTURAL IMPACT ASSESSMENT

for

Luxcon 88 Pty Ltd
Level 18, 25 Bligh Street
SYDNEY NSW 2000

SITE ADDRESS

84 – 106 ANZAC PARADE
KENSINGTON NSW

DECEMBER 2013



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1 INTRODUCTION

- 1.1 This Arboricultural report was commissioned by Mr. Ilya Melnikoff, on behalf of Luxcon Group Pty Ltd ("the Applicant"). The subject site is identified as 84 – 106 Anzac Parade, Kensington, New South Wales and herein referred to as "the site".
- 1.2 This report is to accompany a development application to Randwick Council for a proposed multi-storey, mixed use retail and residential development of the site ("the proposal"). The application DA/320/2013 is currently under assessment and is referred to the Joint Regional Planning Panel ("JRPP") for determination.
- 1.3 A forty-seven page report prepared by Willana Associates Pty Ltd for the JRPP has identified a requirement of the Applicant for additional information in regard to the potential impacts of the proposal on a *"...row of large and significant Gums growing wholly on adjoining private properties to the east.....and which overhang substantially into the subject site"*.
- 1.4 This report calculates the potential root zone encroachments of the proposal using Australian Standard 4970-2009 *Protection of trees on development sites* as a guide and provides recommendations to assist the protection and management of the trees to be retained.
- 1.5 Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.
- 1.6 This Arboricultural report is not intended as an assessment of any impacts on trees by any proposed future development of the site other than the current development application.
- 1.7 This report is not intended to be a comprehensive tree *risk* assessment; however the report may make recommendations, where appropriate, for further assessment, treatment or testing of trees where potential structural problems have been identified, or where below ground investigation may be required.

2 METHODOLOGY

- 2.1** In preparation for this report, ground level, limited *visual tree assessments* (VTA)¹ of the subject row of Gums ("the trees") were undertaken by the author of this report on 10th October and 5th November 2013. The VTA's were limited as access to properties where the subject trees are growing was not approved by property owners at the time of the inspections.
- 2.2** Tree heights and crown spreads were visually estimated from within the site and by use of Google earth images. Trunk diameters noted on the detail and level survey were used to calculate the *Structural Root Zone* ("the SRZ") and *Tree Protection Zone* ("the TPZ") of the subject trees. It should be noted these figures on the survey are generally basal measurements and are usually greater than the *diameter at breast height* measurements adopted by arboriculturists for root zone calculations.
- 2.3** Field observations were recorded on HanDBase4 for iphone. Photographs were taken using a Canon EOS1000D digital SLR camera.
- 2.4** No *aerial inspections*, *root mapping* or woody tissue testing were undertaken as part of the limited tree assessments. Information contained in this tree report covers only the trees that were examined and reflects the condition of those trees at the time of inspection.
- 2.5** Plans and documents referenced for the preparation of this report include:
- Detail and Level Survey, Ref. No. 2070/12, dated 12/09/13, prepared by Eric Scerri & Associates Pty Ltd;.
 - JRPP report 2013SYE051 by Willana Associates Pty Ltd, undated.
 - Letter prepared by Tony Lavorato of Aurecon Australia Pty Ltd, 04/12/13.
 - Appendix A – Revisions to Eastern Boundary Landscape Setback, Issue E, dated 04/12/13, prepared by Site Image.
 - Trees in adjoining properties – preliminary advice, dated 16/10/13 prepared by Urban Forestry Australia.
- 2.6** The subject trees are shown on a marked up excerpt of the Details and Levels Plan. This marked up plan is attached as Appendix D – Tree Location Plan.

¹ Visual Tree Assessment (VTA) is a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

3 OBSERVATIONS AND DISCUSSION

3.1 Assessed Trees

3.1.1 There are ten (10) identified 'gum' trees growing in adjoining properties near the site's east boundary.

Of these trees;

- One (1) is a semi-mature *Corymbia maculata* (Spotted Gum) at the rear of 25 Ellesmere Road,
- Four (4) are semi-mature to mature *Eucalyptus microcorys* (Tallowwood) at the rear of 9-13 and 15-19 Ellesmere Road, and
- Five are semi-mature to mature *Eucalyptus botryoides* (Bangalay) at the rear of 9-13 and 15-19 Ellesmere Road, and

3.1.2 Tree 1 – Spotted Gum

This tree is approximately 14 – 16m high with an estimated crown diameter of around 10 – 12m, which extends 6 - 7m into the site. The tree's trunk diameter is approximately 400mm.

The tree appears to be vigorous and there were no obvious defects visible from my diagonal viewing point from the rear yard of 100 Anzac Parade. I could not view the lower trunk and base as these are obscured by the existing paling fence.

It is impossible to apply a *Useful Life Expectancy* category or provide a *Retention Value* to the tree without a full visual assessment from all sides of the tree.

This tree has a moderate to high *Landscape Significance* in this urban setting.

3.1.3 Trees 2, 3, 4, 8 and 10 – Tallowwoods

These trees are approximately 18 – 20m high with variable crown diameters of 10 – 16m. The crowns of some of these trees extend around 10m into the site.

These trees range from around 400 – 700mm trunk diameters. Their locations vary from immediately next to the boundary (T2) to approximately 4.8m from the boundary (T4).

The trees are, for the most part, vigorous. Tree branch structure is somewhat compromised by past, poor pruning practices, including *topping* and *lopping*, past crown raise pruning and competition for light, all of which have contributed to crown bias over the site.

As noted above, it is impossible to apply a *Useful Life Expectancy* category or provide a *Retention Value* to a tree without a full visual assessment from all sides of a tree.

As a group these trees have a high *Landscape Significance*.

3.1.4 Trees 5, 6, 7 and 9 – Bangalays

These trees are also approximately 18 – 20m high with variable crown diameters of 10 – 16m. The crowns of these trees extend around 10m into the site.

The trees are generally vigorous and have undergone similar pruning as the Tallowwoods.

These trees have approximately 400mm trunk diameters. Their locations vary from immediately next to the boundary (T5) to approximately 1m from the boundary (T6 and T9).

Again, it is impossible to apply a Useful Life Expectancy category or provide a Retention Value to these trees without a full visual assessment from all sides.

As a group these trees have a high Landscape Significance.

3.2 **Proposed Tree Removal**

3.2.1 No trees are proposed for removal.

3.3 **Potential Impacts on Trees Proposed for Retention.**

3.3.1 As a result of concerns raised with the original excavation scheme, which included excavation to less than 1.5m from the boundary using a piling rig and their potential for negative impacts on the trees, discussions between the author and other project consultants have resulted in an alternative excavation methodology that resolves these concerns.

3.3.2 The excavation will now be set back from the boundary by approximately 3.3m at the southern end of the east boundary, gradually increasing to around 4.3m at the northern end. This places all excavation outside the notional SRZ of all of the trees.

3.3.3 Despite disturbance, much of the original deep sandy soils will be present which may assist root development into the site to some degree, however it is unlikely that non-woody roots extend many metres into the site due to the entire area being covered with concrete, severely limiting available oxygen levels. It is also quite likely the existing boundary walls, footings and other boundary structures have deflected some root growth away from the site. Much better growing conditions exist in the rear yards where the trees are located.

3.3.4 The potential extent of impacts on protected trees to be retained can be generally rated using the *Impact Level Rating* ("ILR") table 1, below.

IMPACT LEVEL RATING	
0	0 – 0.9% of root zone impacted – no impact of significance
L	1 to 10% of root zone impacted – low level of impact
L - M	>10 to 15% of root zone impacted – low to moderate level of impact
M	>15 to 20% of root zone impacted – moderate level of impact
M – H	>20 to 25% of root zone impacted – moderate to high level of impact
H	>25 to 35% of root zone impacted – high level of impact
S	>35% of root zone impacted – significant level of impact

Table 1: Guideline to the rating of impacts on trees to be retained.

Based on discussions with executive members of the Institute of Australian Consulting Arboriculturists.

3.3.5 Encroachments into the SRZ and extent of encroachments into the TPZ of the trees to be retained are summarised below.

Tree No.	Tree	SRZ affected	TPZ area (m ²)	TPZ encroachment (approx. m ²)	TPZ encroachment (approx. %)	ILR
1	Spotted Gum	×	72	3.5	5	L
2	Tallowwood	×	163	25.5	<16	M
3	Tallowwood	×	222	42.5	≈19	M
4	Tallowwood	×	113	0	0	0
5	Bangalay	×	72	1.5	2.1	L
6	Bangalay	×	72	0	0	0
7	Bangalay	×	72	0	0	0
8	Tallowwood	×	72	0	0	0
9	Bangalay	×	72	0	0	0
10	Tallowwood	×	72	0	0	0

Table 2: Estimated encroachments into the SRZ and TPZ of trees proposed for retention.

3.3.6 Tree 1 – Spotted Gum

This tree is growing in ground separated from the site by a brick retaining wall around 800mm above the site's existing ground level. It is unlikely major woody support roots or large amounts of fine 'feeder' roots would be located in site due to the presence of this wall. At a 3.3m boundary offset the excavation encroachment into the notional 4.8m TPZ radius (72m²) is estimated to be approximately 3.5m² and represents less than 5% of the TPZ area. This is a minor and supportable encroachment, particularly considering the disturbance is likely to be much less due to existing constraints to root growth into the site.

3.3.7 Trees 2, 3, 4, 8 and 10 – Tallowwoods

At approximately 3.8m offset, the excavation will represent moderate encroachments into the TPZ's of T2 and T3. These are unlikely to adversely affect the trees, particularly as their non-woody roots are more likely to be concentrated within the better growing conditions within the properties where the trees are located.

Trees 4, 8 and 10 will have nil TPZ excavation encroachment.

3.3.8 Trees 5, 6, 7 and 9 – Bangalays

At approximately 4m offset, the excavation will represent a minor encroachment into the TPZ of T5. The remaining trees 6, 7 and 9 will have nil encroachments.

3.3.9 Tree pruning

The Spotted Gum (T1) crown extends approximately 6 – 7m into the site and the crowns of some, not all, the Tallowwoods and Bangalays are up to 10m into the site.

The trees' branches are ascending and, where they cross the proposed excavation line, are between approximately 5 – 8m+ above existing ground level in the site.

It is possible some removal of lower limbs will be required for machinery clearance, however it is my understanding the upper basement B1 can be excavated with a 'low height' rig used for a limited access situation such as under tree crowns (T. Lavorato pers. comm. Dec., 2013).

3.3.10 Proposed above ground structures, such as walls, planters and the main buildings are adequately setback from the trees to avoid any major pruning issues.

4 CONCLUSIONS

The amended excavation methodology is supportable from an arboricultural perspective.

Interference with tree root anchorage and vigour is avoided by the increased boundary offsets to excavation.

Some pruning of low tree limbs is anticipated, but the extent of pruning is not significant as the majority of branches are ascending and elevated above the site so as to avoid a low height pile rig and built structures.

The proposal will not remove, nor adversely impact on, any of the large and significant gum trees in the properties adjoining the site's east boundary.

5 RECOMMENDATIONS

5.1 Minimising Impacts on Trees to be Retained.

5.1.1 Tree 1 – Spotted Gum

- Retain the existing brick wall near the tree's base if possible; the tree may rely on this wall for some stability.

5.1.2 All trees

- Prior to demolition all trees are to be assessed by an AQF level 5 arboriculturist for site specific pruning requirements and tree protection measures to maintain tree viability and assist reasonable work access.
- A qualified arboriculturist is to supervise demolition works within 5m of the trees.
- Any areas of ground within 4m of the trees and exposed after removal of existing structures including pavement is to be watered thoroughly and protected from soil moisture loss by a 100mm depth layer of coarse mulch.

5.2 Tree Protection Zones – General advice

5.2.1 The project arboriculturist is to prepare a Tree Protection Plan ("TPP") prior to demolition.

Tree Protection (where specified in the TPP) is to be in accordance with the following:

- Protection devices may include mulching, tree guards, branch wrapping and other devices other than fencing.
- TPZ devices must be in place prior to any site works commencing, including clearing, demolition or grading.
- It is recommended that an AQF5 arboriculturist provide written certification that the TPZ is installed and will satisfy tree protection requirements.
- The TPZ devices cannot be removed, altered, or relocated without the project arborists' prior assessment and approval.
- No stockpiling can take place within the TPZ's.
- An AQF5 arboriculturist must be retained to carry out and/or supervise works within the SRZ and TPZ of the trees.
- Providing a regular supply of water to the trees during the period of works is recommended.
- Removal of mulch is advised after construction to remove any contaminants.
- Regular monitoring of the trees during development works for unforeseen changes or decline will help maintain the trees in a healthy state.

5.3 General Arboricultural advice

5.3.1 Stockpiling and location of site sheds

- It is advised that any areas of proposed stockpiling within the TPZ of trees to be retained must be covered with thick, coarse mulch, placement of wooden pallets over the mulch, covering of the pallets with a tarpaulin (or similar), and the placement of materials on top of this device.

5.3.2 Underground Services

- All proposed stormwater lines and other underground services should be located as far away as practicable, to avoid excavation within the TPZ of trees to be retained.
- For underground services, where the incursion to the TPZ is less than 10% of the total TPZ, a chain trenching device may be used. A backhoe or skid steer loader is unacceptable due to the potential for excessive compaction and root damage.
- Where large woody roots (greater than 50mm in diameter) are encountered during excavation or trenching, these shall be retained intact wherever possible (e.g. by sub-surface boring beneath roots or re-routing the service etc).
- Excavations required for underground services within the TPZ of any tree to be retained should only be undertaken by sub-surface boring. The Invert Level of the conduit, plus the conduit diameter, must be lower than the estimated root zone depth as specified. This will depend on the soil conditions at the site. Where this is not practical and root pruning is the only alternative, proposed root pruning should be assessed by the arborist to determine continued health and stability of the subject tree.
- If trees show signs of stress or deterioration, remedial action shall be taken to improve the health and vigour of the subject tree(s) in accordance with best practice arboricultural principles.

5.3.3 Fill Material

- Placement of fill material within the TPZ of trees to be retained should be avoided where possible. Where placement of fill cannot be avoided, the material should be a coarse, gap graded material such as 20 — 50mm crushed basalt or equivalent to provide some aeration to the root zone. Note that roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose.
- The fill material should be consolidated with a non-vibrating roller to minimise compaction of the underlying soil.
- A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade. No fill material should be placed in direct contact with the trunk.

5.3.4 Fencing and walls within the SRZ and TPZ of retained trees.

- Where fencing and/or masonry walls are to be constructed along site boundaries, they must provide for the presence of any living woody tree roots greater than 50mm diameter.
- Hand digging must occur within the SRZ of trees to be retained.
- For masonry walls or fences it may be acceptable to delete continuous concrete strip footings and replace with suspended in-fill panels (e.g. steel or timber pickets, lattice etc) fixed to pillars.

5.3.5 Pavements

- Pavements should be avoided within the TPZ of trees to be retained where possible.
- Proposed paved areas within the TPZ of trees to be retained should be placed above grade to minimise excavations within the root zone and avoid root severance and damage.

5.3.6 Landscaping within tree root zones.

- The level of introduced planting media into any proposed landscaped areas within the Tree Protection Zone (TPZ), is not to be greater than 75mm depth, and be of a coarse, sandy material to avoid development of soil layers that may impede water infiltration.
- Container size of proposed plants within the TPZ of trees should be determined prior to purchase of plants. This is to identify planting locations and container size of plants at the time of planting.
Otherwise, any proposed landscaping within the TPZ must consist of tubestock only. This is required to ensure that damage to tree roots and excessive root loss or disturbance is avoided.
- Mattocks and similar digging instruments must not be used within the TPZ of the trees. Planting holes should be dug carefully by hand with a garden trowel, or similar small tool.
- Where possible, do not plant canopy trees beneath, or within 6 - 8m of overhead power lines.

5.3.7 Other

- No washing or rinsing of tools or other equipment, preparation of any mortars, cement mixing, or brick cutting is to occur within the TPZ of trees to be retained.
- Regular monitoring of the trees during development works for unforeseen changes or decline will help maintain the trees in a healthy state.

Report prepared by Catriona Mackenzie

December, 2013.




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Member of the Australian Institute of Horticulture

Member of the International Society of Arboriculture

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APPENDIX A

TERMS AND DEFINITIONS



TERMS AND DEFINITIONS

The following relates to terms or abbreviations that have been used in this report and provides the reader with a detailed explanation of those terms.

Aerial inspection Where the subject tree is climbed by a professional tree worker or arborist specifically to inspect and assess the upper stem and crown of the tree for signs or symptoms of defects, disease, etc.

Condition refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Crown All the parts of a tree arising above the trunk where it terminates by its division forming branches, e.g. the branches, leaves, flowers and fruit: or the total amount of foliage supported by branches.

Diameter at Breast Height (DBH) refers to the tree trunk diameter at breast height, i.e. measured at 1.4 m above ground level.

Health (syn. vigour) refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

Landscape Significance Rating. The importance of the tree as a result of its prominence in the landscape and its amenity value, from the point of public or ecological benefit. Refer to Appendix C for details.

Lopping Cutting between branch unions (not to branch collars), or at internodes on a tree, with the final cut leaving a stub. Lopping may result in dieback of the stub and can create infection courts for disease or pest attack.

Mature refers to a full sized tree with some capacity for further growth.

Non-woody roots. Roots where the primary function is the absorption of water and nutrients in solution. Smallest non-woody roots also referred to as 'fibrous' or 'fine' roots. Protection and retention of these roots is important to tree viability. Some non-woody root loss is tolerable, depending on the tree's age, vigour, species tolerance, growing conditions, etc.

Retention Value (RV) refers to the retention value of a tree, based on the tree's estimated or *Useful Life Expectancy* (ULE) and significance of the tree in the landscape. The RV is a subjective value. Refer to Appendix C for more detail. Note: Where further investigation (e.g. where a lack of access to a tree prevents clear visual assessment) or testing of trees is required, a RV cannot be accorded to those trees until further assessment, investigation or testing has taken place.

Risk The random or potentially foreseeable possibility of an event causing harm or damage.

Root Mapping The exploratory process of recording the location of roots usually in reference to a datum point where depth, root diameter, root orientation and distance from trunk to existing or proposed structures are measured. It may be slightly invasive (disturbs or displaces soil to locate but not damage roots, e.g. hand excavation, or use of air or water knife), or non-invasive (does not disturb soil, e.g. ground penetrating radar).

Semi-mature refers to a tree at growth stages between immaturity and full size.

Structural Root Zone (SRZ) Refers to the radial distance in metres, measured from the centre of the tree stem, which defines the critical area required to maintain stability of the tree. Only thorough investigation into the location of structural roots within this area can identify whether any minor incursions into this protection zone are feasible.

Note: The SRZ is calculated on the diameter measured immediately above the root/stem buttress (DAB). Where this measurement is not taken in the field, it is calculated by adding 12.5% to the stem diameter at breast height (DBH). (Based on averages calculated from DBH and DAB measurements taken from 20 mature Brush Box and Camphor Laurel). The SRZ may not be symmetrical in shape/area where there is existing obstruction/confinement to lateral root growth, e.g. structures such as walls, rocky outcrops, etc).

Topping or heading is a pruning practice that results in removal of terminal growth leaving a cut stub end. Topping causes serious damage to the tree.

Tree Protection Zone (TPZ). Refers to the radial distance in metres, measured from the centre of the tree stem which defines the *tree protection zone* for a tree to be retained. This is generally the minimum distance from the center of the tree trunk where protective fencing or barriers are to be installed to create an exclusion zone. The **TPZ** surrounding a tree aids the tree's ability to cope with disturbances associated with construction works. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death and the possibly damage to structural stability of the tree from root damage.

To limit damage to the tree, protection within a specified distance of the tree's trunk must be maintained throughout the proposed development works. No excavation, stockpiling of building materials or the use of machinery is permitted within the TPZ.

Note: In many circumstances the tree root zone does not occupy a symmetrically radial area from the trunk, but may be an irregular area due to the presence of obstructions to root spread or inhospitable growing conditions.

USEFUL LIFE EXPECTANCY (ULE)

In a planning context, the time a tree can expect to be usefully retained is the most important long-term consideration. ULE i.e. a system designed to classify trees into a number of categories so that information regarding tree retention can be concisely communicated in a non-technical manner.

ULE categories are easily verifiable by experienced personnel without great disparity.

A tree's ULE category is the life expectancy of the tree modified first by its age, health, condition, safety and location (to give the life expectancy); then by economics (i.e. cost of maintenance - retaining trees at an excessive management cost is not normally acceptable); and finally, effects on better trees, and sustained amenity (i.e. establishing a range of age classes in a local population).

ULE assessments are not static but may be modified as dictated by changes in tree health and environment. Trees with a short ULE may at present be making a contribution to the landscape, but their value to the local amenity will decrease rapidly towards the end of this period, prior to them being removed for safety or aesthetic reasons.

Visual Tree Assessment (VTA) a procedure of defect analysis developed by Mattheck and Breloer (1994), that uses the growth response and form of trees to detect defects.

Woody roots usually used in reference to the first order roots i.e. structural (anchor) roots and woody lateral roots within the Structural Root Zone. Damage, disturbance to, or severing of these roots can compromise the stability of the tree.

APPENDIX B

ULE CATEGORIES



ULE categories (after Barrell 1996, Updated 01/04/01)

The five categories and their sub-groups are as follows:

1. Long ULE - tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:

- A. structurally sound trees located in positions that can accommodate future growth
- B. trees which could be made suitable for long term retention by remedial care
- C. trees of special significance which would warrant extraordinary efforts to secure their long term retention

2. Medium ULE - tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:

- A. trees which may only live from 15 to 40 years
- B. trees which may live for more than 40 years but would be removed for safety or nuisance reasons
- C. trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
- D. trees which could be made suitable for retention in the medium term by remedial care

3. Short ULE - tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:

- A. trees which may only live from 5 to 15 years
- B. trees which may live for more than 15 years but would be removed for safety or nuisance reasons
- C. trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
- D. trees which require substantial remediation and are only suitable for retention in the short term.

4. Removal - trees which should be removed within the next 5 years.

- A. dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- B. dangerous trees through instability or recent loss of adjacent trees
- C. dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- D. damaged trees that are clearly not safe to retain.
- E. trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.
- F. trees which are damaging or may cause damage to existing structures within the next 5 years.
- G. trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
- H. trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5. Small, young or regularly pruned - Trees that can be reliably moved or replaced.

- A. small trees less than 5m in height.
- B. young trees less than 15 years old but over 5m in height.
- C. formal hedges and trees intended for regular pruning to artificially control growth.

APPENDIX C

SIGNIFICANCE OF A TREE ASSESSMENT RATING



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

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

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

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

Tree Significance - Assessment Criteria



1. High Significance in landscape

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

2. Medium Significance in landscape

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

3. Low Significance in landscape

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

Environmental Pest / Noxious Weed Species

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

Hazardous/Irreversible Decline

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


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

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

Table 1 - Tree Retention Value - Priority Matrix.

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					

Legend for Matrix Assessment



	Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.
	Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

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

REFERENCES

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

Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia.

APPENDIX D
TREE LOCATION PLAN



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