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# ARBORICULTURAL IMPACT ASSESSMENT & TREE PROTECTION MEASURES

CK Designs
144-146 Boronia,
GREENACRE

Report Reference: AIA – CK (G) 0/19

13th March, 2019

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# 1.0 Introduction

I. This Arboricultural Impact Assessment (AIA) was commissioned by CK Designs, on behalf of property owners of 144-146 Boronia Rd, Greenacre with regards to providing an assessment of three (3) trees potentially impacted by the development on the site.

II. The proposal entails the demolition of existing dwellings and structures and construction of a new boarding house. (DA 384/2018)

III. The AIA is required to following feedback from Canterbury Bankstown Council that recognises that a site tree and two (2) neighbouring trees, located on 16 Orana Place, are potentially impacted by Block E and Block F of the design and must be assessed with respect to the Australian *Standard- Protection of trees on development* sites (AS 4970/2009).

IV. In consultation with clients and architects, plan changes were endorsed to minimise impacts to T1 and T3, with the Arborist generally supportive of the proposal with respect to retained trees once changes were made.

V. The Arborist has recommended the redesign of Block F to incorporate a sufficient setback from T1, and that viable construction techniques be implemented as part of this proposal for the construction of Block E.

VI. Further recommendations for stormwater design and landscape must also be incorporated into revised plans.

# 2.0 Methodology

I. Trees were inspected by means of Visual Tree Assessment (VTA), at ground level only, on 13th March 2019.

II. No subterranean or canopy inspections were undertaken.

III. All dimensions are estimated by diameter tape or by eye sight.

IV. T2 and T3 were assessed from over the client's fence, with observations being limited especially for T3. The Arborist has had to rely on the survey data to calculate setbacks and incursions.

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

   a. Genus & species, Common name, age, vigour and crown characteristics, general health and condition, defects and the presence of pest and disease.

b. An appraisal of trees with reference to Tree AZ; determination of the worthiness of trees in the planning process, and a Tree Retention Value (STARS Matrix) that assesses the trees significance and 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.

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

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

VIII. A Site Plan is included in Appendix, using survey provided by the client, and overlaid by the Arborist, to annotate tree locations only.

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

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

| Plan Type/Document | Provided by | Reference | Date |
|---|---|---|---|
| Survey | NJB Surveying | Issue 2 | 23.06.18 |
| Site Plan & Demolition Plan | CK Designs | Project 17053-03 A 1-04 Rev E | 23.11.2018 |
| Ground Floor Plan | CK Designs | Project 17053-03 A 1-10 Rev E | 23.11.2018 |
| Elevations | CK Designs | Project 17053-03 A 1-13 Rev E | 23.11.2018 |
| Elevations | CK Designs | Project 17053-03 A 1-14 Rev E | 23.11.2018 |
| Sections | CK Designs | Project 17053-03 A 1-15 Rev E | 23.11.2018 |
| Landscape | RFA | L-02/2 Issue C | 22.11.2018 |
| Site and Roof Drainage Plan | United Consulting | 18MB7697/D01 | Issue C |

# 3.0 Observations

## 3.1 Site Observations

I. The site is referred to as Lot 3 and Lot 4 DP 236854 of Canterbury Bankstown Council and accommodates a freestanding dwelling on each site.

II. The sites predominately face north with a minor cross slope east and very small drop to the rear.

III. Although not formally assessed, exposed grounds reveal site soil to be clay.

IV. Trees observed in rear setbacks and adjoining properties.

## 3.2 Tree Observations

**Table 1: Tree Assessment & Impacts Evaluation**

| # | Genus Species | Common Name | DBH (mm) | Height (m) | Spread (m) | Age | Vigour | Condition | Crown Form | Canopy Cover % | Defects | Pest &Disease | TREEAZ | Significance | Retention Value | TPZ (m) | SRZ (m) | Setback from proposed work (m) | Impacts/ Incursion % **Nil** **Low** **Moderate** **Major** **Total Loss (TL)** | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | |
| 1 | *Melaleuca decora* | White feather Honey myrtle | 220x2 200 260 | 7 | 6 | M | G | G | D | 80 | NO | NO | A2 | H | M | 5.4 | 2.57 | 3.5 | 11.84 | Viable tree and a locally occurring species<br>Low degree of impact from revised design of Block F.<br>Refer to 5.0 in this report. |
| 2 | *Thuja plicata* | Cedar | 160 | 6+ | 3 | EM | G | G | D | 80 | NA | NA | A2 | L | NA | 2.0 | 1.61 | 2.0+ | 0 | Small tree. Not impacted. Roots are kerbed. |
| 3 | *Cupressus glabra* | Smooth bark cypress | 420 | 12+ | 8 | M | G | G | F | 80 | NO | NO | A2 | M | NA | 5.04 | 2.47 | 2.3 | 21.99 | Viable adjoining tree near Block E. Major impact must be managed with Arborist recommendations.<br>Refer to 5.0, 6.0 in this report. |

## 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.

I.

## 5.0 Conclusion & Recommendations

I. The Arborist concurs with Canterbury Bankstown Council in that the trees assessed in this report, being T1-T3, are to be retained and protected as part of the proposal.

II. Designers have worked together with the Arborists initial feedback regarding acceptable setbacks to minimise incursion rates and with the use of viable construction techniques recommended in this report, such trees can *remain* viable.

III. In the case of T1, the Arborist supports a setback of 3.5m to Block F, to minimise the incursion rate to 11.84%, *marginally* higher than the allowable 10% incursion by AS4970/2009. Additionally, the Arborist notes the tree is of good vitality and will sustain the incursion, albeit conditionally.

IV. However, it is prudent that this setback also be applied to stormwater engineering for this project, and that the drainage plans be amended to also include a 3.5m radial setback to all pipes and pits. Currently, stormwater passes directly in the SRZ/TPZ of this tree.

V. For T2, the Arborist is satisfied that both the 300mm section of concrete and the concrete hob (retainer) built along the fence dividing the tree and client's site, has likely to have kerbed roots for this tree and contained them into the site in which it stands. The building setback in plans is also outside the TPZ, resulting in no *direct* impact to this tree.

VI. Even though the Arborists observations of T3 was somewhat limited, the setbacks of the tree's location to the proposed building in the Impacts Summary has been calculated according to the survey data, resulting in a discrepancy of approx. 500mm with measurements from those of Canterbury Bankstown Council. The calculations of impacts *do* suggest a major encroachment of 21.99%, with the SRZ also impinged, of which the tree could not afford theoretically, which would have to be removed or managed. The Arborist and designers *have* negotiated methods of construction for this building that will essentially minimise ground intrusion to a tolerable degree in accordance with AS4970/2009 and allow for the tree to be adequately retained with such viable methods of construction. (refer to 6.0 Viable Construction Methods).

VII. The Landscape Plan suggest that landscape elements are generally sympathetic to the trees , and it is endorsed that no changes to soil grades are made within the TPZ of these trees, and that T1 be made a feature tree for the Communal Open Space area for Block F , therefore it is to be depicted as "retained" on landscape plans, and the drip line is to be shown as a mulched area. Where stepping stones are depicted, in the TPZ of T1 and T2, these are to be laid on grade with no more than 100mm pad below NGL.

VIII. The changes of design to allow for T1 also means there should be no direct canopy with the elevations. The roof of Building E is low set (skillion) also relieving conflict with canopies. It would be good practice for the trees to be pruned to provide better spatial

clearance for the works to be conducted, and to minimise the potential for machinery and contractors to damage tree parts. (Refer to 7.0 Pruning)

IX. Tree Protection Measures (8.0 in this report) provide understanding for the client of what protective measures must be implemented to ensure tree viability.

X. Otherwise, the Arborist is supportive of this design.

## 6.0 Viable Construction Techniques

I. For the protection of T1, the Arborist recommends the following construction for Block F:

a. The soils levels in the TPZ must remain unchanged

b. The excavation for footings within the TPZ must be supervised by the Project Arborist.

II. For the protection of T3, the Arborist recommends the following construction for Block E;

a. The building envelope within the TPZ must be suspended above grade, without fill.

b. The slab of Block E must be supported with pier footings that must be strategically found to avoid tree roots.

c. No piering is to occur in the SRZ.

d. No drop-edge beams or continuous footings allowed.

e. The excavation for piers in the TPZ must be supervised by the Project Arborist.

f. Existing soil levels within the TPZ must remain unchanged.

g. 7.0 Pruning

I. Pruning shall be conducted in accordance with *AS4373- 2007 Pruning of amenity trees*, and by a suitably qualified arborist, min AQF level 3, as follows:

a. T3-Selective Pruning (*S)* 7.2.4 - Remove two (2) x 1st order lateral branches, to provide spatial clearance to facilitate works. Both branches are attached at height range of 3-4-meters with max. diameter of 80mm (as measured at the collar attachment) and face east thus over the client boundary. Removal of live foliage shall not exceed 10% of the entire canopy volume.

## 8.0 Tree Protection Measures

I. The following are tree protection measures to be adhered to for the protection of trees;

a. A **Project Arborist** with a minimum AQF level 5 to be retained to oversee critical stages of works near trees and provide certification where necessary.

b. Tree protection fencing for T1 is to be installed to exclude a 3.0-metres radius and butt into the existing boundary fence. T2, is to rely on existing boundary fence for protection from construction works.

c. Protective fencing shall comprise chain link wire and no less than 1.8 metres high and anchored down with concrete blocks in a non-intrusive manner and not conflict with tree parts. Refer to in Picture 1

Picture 1 (above): Typical fencing for T1


Picture 2 (above): Typical fencing for T3

d. For T3, fencing is not practical, and the alternative is ground protection (rumble boards). The boards must be rigid and fixed atop long timber beams minimum 90mm x 200mm or the like, tightly fixed with metal straps allowing for small voids not exceeding 30mm, essentially creating a platform. The platform must measure 1.5m to cover the with of the side setback and extend 5-metres north and south of the side setback with the centre point being the tree.

e. The platform must be underlain with a layer thick layer of mulch (150mm min.) Refer to in Picture 2. For T1, the protection fencing must be mulched, no less than 150mm depth, and maintained regularly throughout the duration of the works. The mulch must comprise material that complies with AS-4454-2003 *Composts, Soil Conditioners and Mulch*

f. Signs 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 include PA detail. (See Picture 3)


Picture 3: Sample TPZ signage

a. Demolition of the existing garage (north of T1) at the rear of 144 Boronia Rd, must ensure not part of the tree is damaged. Plant and machinery to operate at the front of the garage

b. Machinery must not be stationed and operate within the TPZ of T1,2 and T3 and avoid soil compaction

c. Excavation - proposed excavation must implement hand digging methods and directly supervised by the nominated Project Arborist for the following:
    a. Trench footing for 'block F' within the TPZ of T1 must be supervised.

    b. The excavation for pier holes for Block E. Pier holes must be off-set a minimum 100mm if roots >50mm diameter are encountered and confirmed by the Project Arborist. Such roots shall be encased with hessian to not be encapsulated by concrete.

    c. Stormwater drainage pipes and associated elements that are mandated where encroachment occurs the TPZ of T1 and T3 or any other subterranean services for that matter

d. No stock piling of building materials within the TPZ of retention trees i.e. bricks cement bags, spoil etc.

e. No Construction permitted within the TPZ unless specified in this report and approved by Council.

f. No construction waste wash-off within the TPZ.

g. All Indirect Impacts as stated in this report are to be minimised

*Yours Faithfully,*

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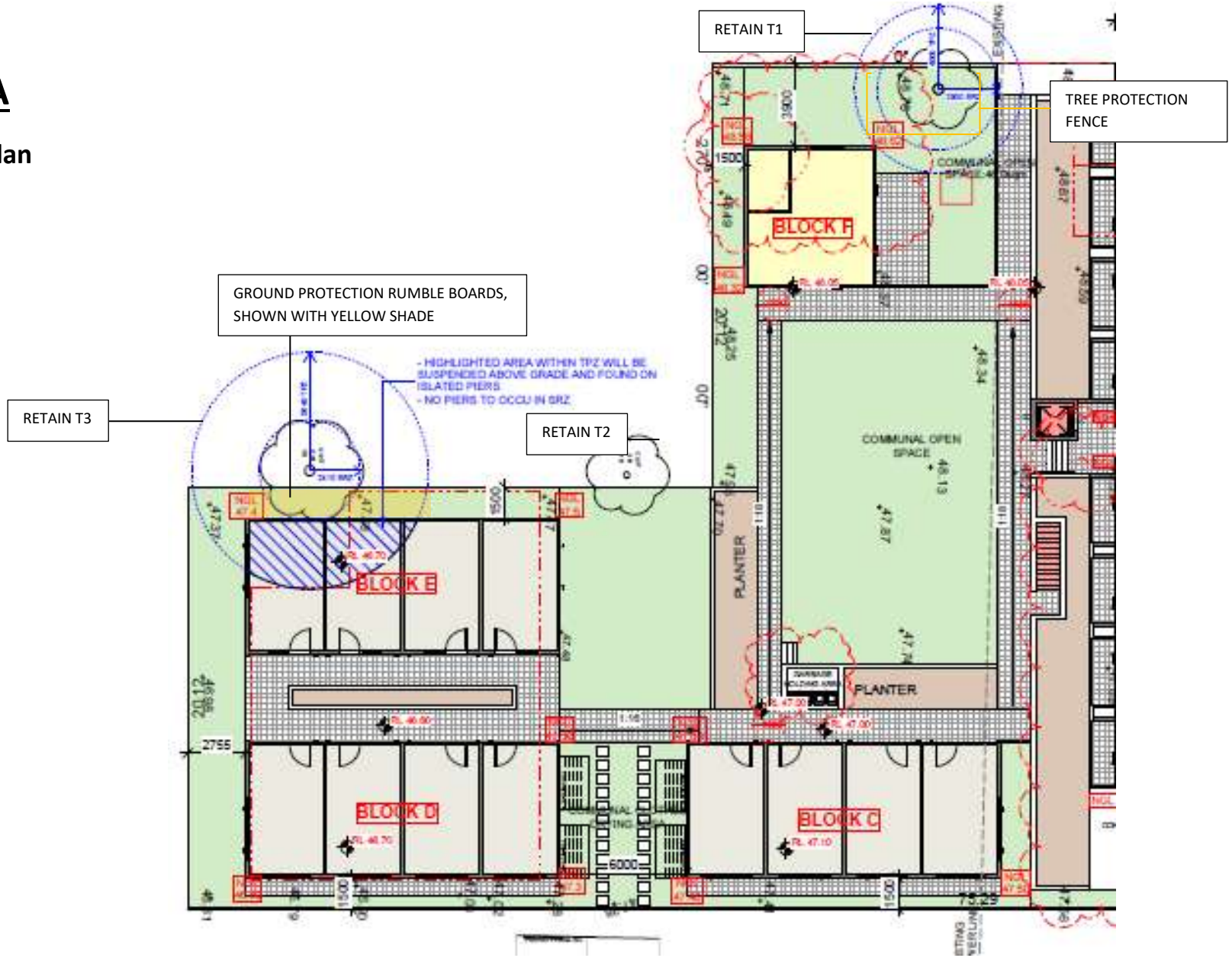
# Appendix A

## Tree Location Plan



# Appendix B

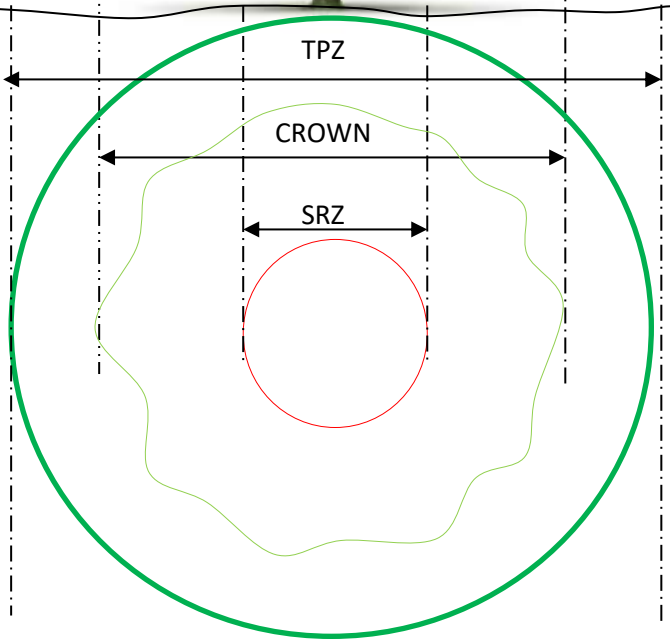
| Tree Assessment & Impacts Evaluation Table Notes | | | | | |
|---|---|---|---|---|---|
| **DBH** | Diameter at Breast Height (estimated circumference of tree at approximately 1400mm) | | | | |
| **H** | Height of tree (estimated) | | | | |
| **S** | Spread of tree (estimated) | | | | |
| **Age** | Y = Young J= Juvenile M= Mature O=Over mature S=Senescent<br>EM = Early Mature | | | | |
| **Vigour** | G= Good F=Fair L= Low D=Dormant | | | | |
| **Condition** | G= Good F=Fair P= Poor D= Dead | | | | |
| **Crown Form** | D=Dominant C=Co-dominant I=Intermediate S=Suppressed F=Forest<br>E=Emergent H = Hedge P = Palm | | | | |
| **Crown Cover** | Percentage of crown foliage present on tree.<br>D = Dormant at time of inspection, no foliage noted | | | | |
| **Defects** | **BI**= Bark Inclusion (defect fork) **BC** = Basal cavity **BD** = Basal decay **C**=Cavity or hollow **CC**= Cable conflict **DB**= Dieback **DC**= Declining canopy **DF** = Dead Fronds **DW**= Deadwood **H** = Hangers **KT** = Kinked trunk **L=** Lopped **MW**= Mechanical wound **PBA** = Poor Branch Attachment **R**=Root exposure/decay **RD** = Root Decline **SBD** = Summer Branch Drop **SC** = Stem cavity **SF**= Stem Failure **SFW** = Stem failure Wound **SW**=Stem Wound **TO** = Tear out | | | | |
| **Pest and Disease** | B=Borers F=Fungal T= Termites NO = Nothing Obvious O= other | | | | |
| **TREES AZ** | Categorisation of trees with regards to development<br>Refer to Appendix – Tree AZ | | | | |
| **Significant Scale** | H=High M=Medium L=Low<br>(Refer to Appendix - Significance of a Tree, Assessment Rating System (STARS)© | | | | |
| **Retention Value** | H=High M=Medium L=Low R=Removal<br>(Refer to Appendix - Significance of a Tree, Assessment Rating System (STARS)© | | | | |
| **TPZ** | Calculated area above and below ground at a radial distance form centre of trunk.<br>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<br>No impact | Low<br>0% - 15% | Moderate<br>15%- 25% | Significant<br>25%+ | Total Loss<br>Lost to proposal |
| **Comments** | Arborist commentary on tree location, health , structure and relationship to development. | | | | |

# Appendix C

## 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 D

## 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,

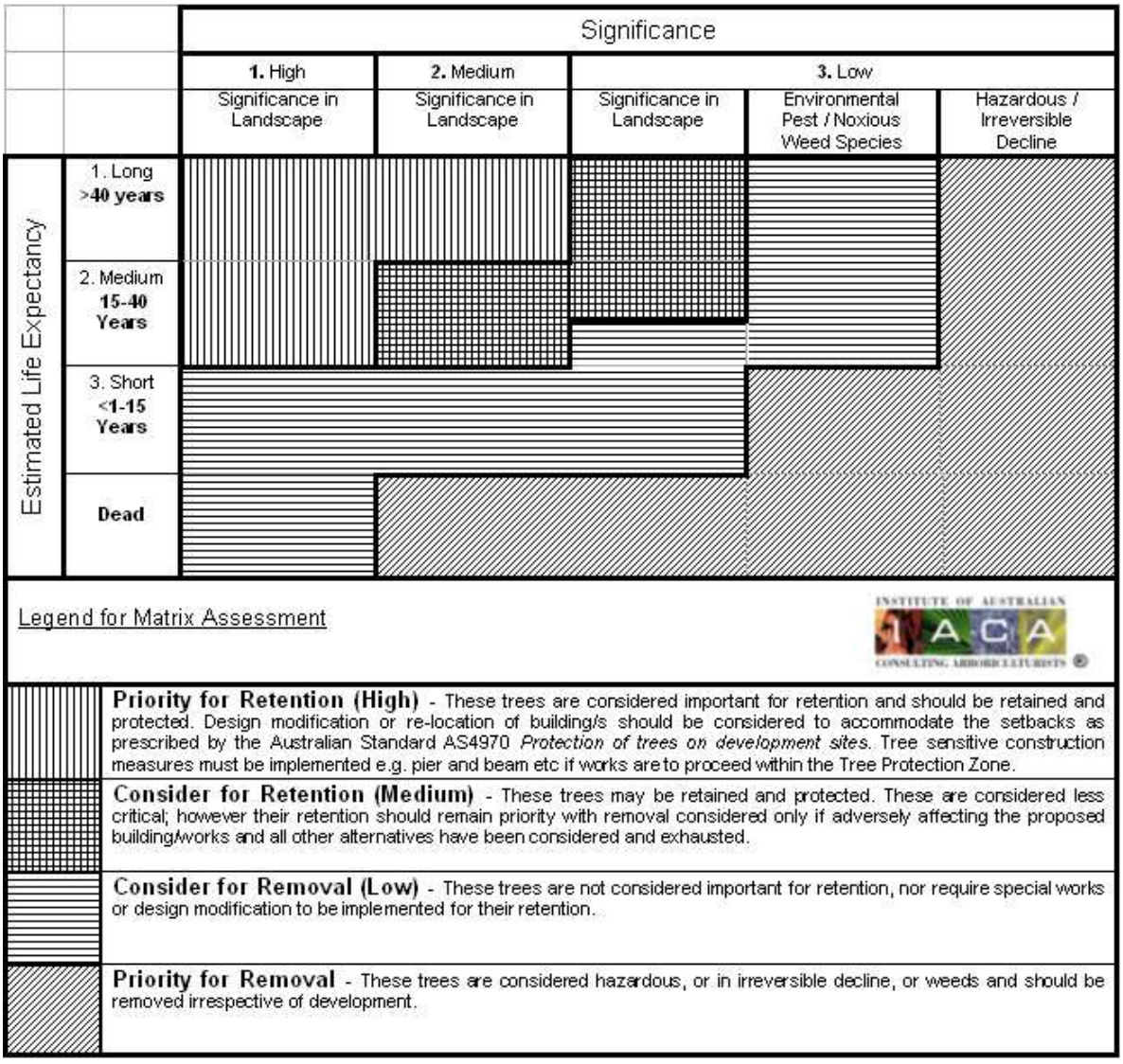
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.
  Environmental Pest / Noxious Weed Species
- The tree is an Environmental Pest Species 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 E

## 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 F

## 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.

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# 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

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