

HARWOOD
TREE CARE & CONSULTING

Prepared By Tim Harwood
Prepared for Jo Gardner
Version 1.0

15 CORNELIAN RD PEARL BEACH

ARBORICULTURAL IMPACT ASSESSMENT



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Executive summary

Our client Jo Gardner requested an Arboricultural Impact Assessment (AIA) from Harwood Tree Care and Consulting, the site located is 15 Cornelian Rd Pearl Beach, a site assessment was undertaken on the 1st April 2022 which recorded **2** mature *Angophora costata*'s in the front yard within the building envelope of a proposed "granny flat" installation.

T1 a mature Angophora will be located within the footprint of the proposed build, suffering total encroachment (100%) into its TPZ (Tree Protection Zone) **T1** recorded a High Retention value, though could not be successfully retained under the current proposal, under the governing Australian Standard AS4970-2009 Protection of Trees on Construction Sites, consulting arborists are required to demonstrate every effort in retaining High Retention specimens, under the current proposal **T1** could not be retained, if Central Coast Council were to adjust the front setback limits and permit the build closer to Cornelian Rd then **T1** could be successfully retained

T2 is in bad health suffering from noticeable decline **T2** could be pruned back to its main central leader and left for many years as a habitat tree, this is common within the Arboricultural industry, **T2** could also be removed, removing **T2** would allow room for the required replacement plantings listed in recommendations of this assessment.

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7th April 2022

Introduction/scope

Harwood Consulting was commissioned by Jo Gardner (the client) to prepare an Arboricultural Impact Assessment (AIA) for a proposed new build located at 15 Cornelian Rd Pearl Beach (the site). The site falls within the Central Coast Council Local Government Area (LGA).

The purpose of this report is to:

- Identify tree(s) within the site that are likely to be affected by the proposed works
- Assess the current overall health and condition of the subject tree(s)
- Assess and discuss the impacts to the subject tree(s) as a result of the proposed development
- Evaluate the significance of the subject trees and assess their suitability for retention

The proposal:

- Site preparation activities
- Construction of new dwelling structure
- Installation of above and below ground services
- Landscaping works
- Tree removal

The subject trees:

Inspection of the site was undertaken on the 1st April 2022. A total of trees **2** trees were identified as satisfying the conditions prescribed within the *Central Coast Council: Development Control Plans (DCP) 2017* and were recorded during the inspection.

Documents and plans referenced:

The conclusions and recommendations of this report are based on the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, *AS 4373-2007 Amenity Tree Pruning* and the findings from the site inspections and analysis of the following documents/plans:

- *Gosford Council: Development Control Plan (DCP) 2013*
- *Gosford Council: Local Environment Plan (LEP) 2014*
- *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017*
- Plans supplied by Parkwood Modular Buildings 24th March 2022 Drawing No: Ao1

Method

Visual tree assessment

The subject trees were assessed in accordance with a stage one visual tree assessment (VTA) as formulated by Mattheck & Breloer (1994)¹, and practices consistent with modern arboriculture.

The following limitations apply to this methodology:

- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and testing
- Trees within adjacent properties or restricted areas were not subject to a complete visual inspection (i.e., defects and abnormalities may be present but not recorded).
- Tree heights, canopy spread was estimated and diameter at breast height (DBH) was recorded by tape measure
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection

Retention value

The retention value of a tree or group of trees is determined using a combination of environmental, cultural, physical and social values.

- Low: These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention
- Medium: These trees are moderately important for retention. Their removal should only be considered if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted
- 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 Australian Standard AS4970 Protection of trees on development sites

This tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Arboriculturalists (IACA) Significance of a Tree, Assessment Rating System (STARS). The system uses a scale of High, Medium and Low significance in the landscape. Once the landscape significance of a tree has been defined, the retention value can be determined. Each tree must meet a minimum of three (3) assessment criteria to be classified within a category.

¹VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994). Principle explanations and illustrations are contained within the publication, Field Guide for Visual Tree Assessment by Mattheck, C., and Breloer, H. Arboricultural Journal, Vol 18 pp 1-23 (1994).

Tree Protection Zone (TPZ)

Tree protection zones are areas around trees, below ground and extending to the top of the tree that are identified by Arborists as areas that are sensitive to the trees growth and health, these areas cannot be encroached upon, unless authorised by a level 5 Arborist, TPZ is a calculation of a trees Diameter at Breast Height (DBH) X 12, the calculation provides us with a value that is used as a perimeter around the base of the tree extending outwards to serve as an exclusionary zone.

Structural Root Zone (SRZ)

Structural Root Zone is a calculation of the Diameter at Root Junction (DRJ X 50) 0.42×0.64 this calculation is the representation of the trees root system that is required to ensure structural stability for the tree

Observations

- The site is located in Pearl Beach which is classified as an Endangered Ecological Community (EEC) which could mean the site and build are subject to tighter building and clearing controls
- The site faces East and slopes uphill to the West approx. 16°
- During the assessment **2** mature *Angophora costata* were recorded within the building envelope
- The site has multiple mature trees to the West behind the main dwelling
- Angophoras are endemic to the area, **T1** (furthest from the road) is in good health with a moderate lean, **T2** also a mature *Angophora costata* is in decline, large deadwood >50mm and epicormic growth are signalling its further potential decline
- The site is a sandy loam mixture with an organic layer up to 50mm on top

Site photos



Figure 1 T1 and T2 on location





Figure 2 T2 in decline, epicormic growth and crown dieback

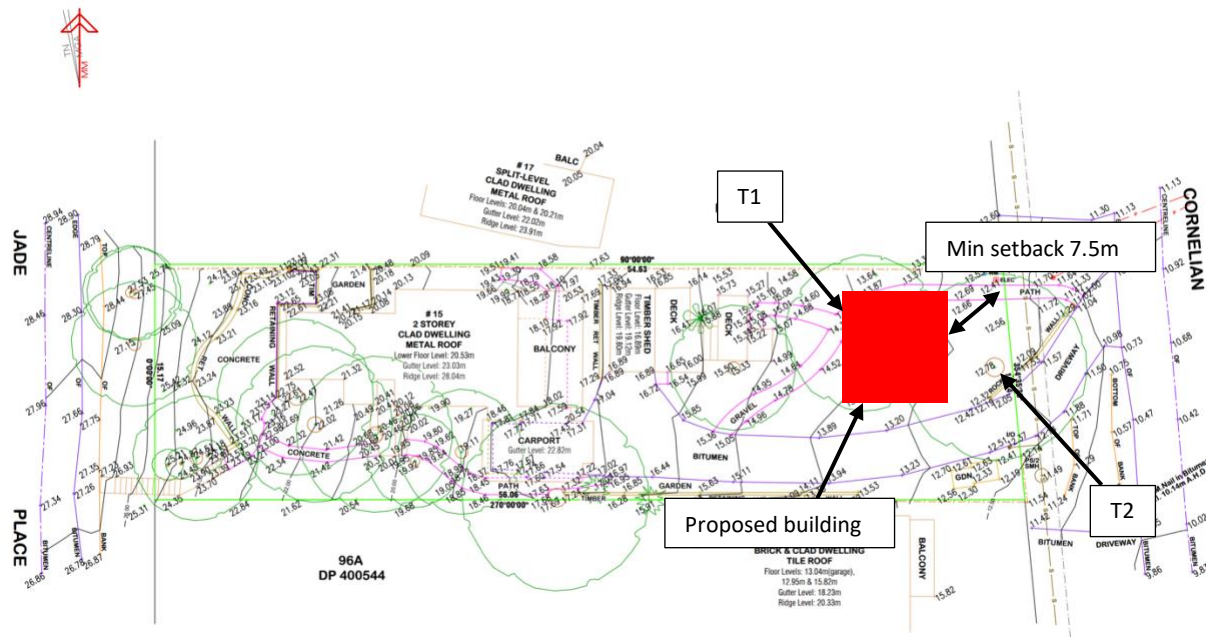


Figure 3 site survey with estimated location of proposed build

- As shown in **Figure 3** the minimum setback required by council is 7.5m this places the building directly on top of T1 resulting in a 100% encroachment into the TPZ (Tree Protection Zone) and SRZ (Structural Root Zone) T1 cannot be successfully retained under the current proposal. The proposed build is located approx. 2m North West from the trunk of T2 resulting into a 30% encroachment, the accepted encroachment into a TPZ is 10% T2 also can not be successfully retained under the current proposal.

Discussion

According to the Australian Standard 4970-2009 Protection of Trees on Construction Sites, the encroachment of a TPZ for any tree should not exceed more than 10%, if an encroachment surpasses a 10% threshold, a cert5 Arborist will need to prove that the tree will remain viable and may deploy a range of mitigation options to ensure impacts are reduced or restricted wherever possible. Mitigation must be increased relative to the level of encroachment within the TPZ to ensure the subject tree remains viable.

AS 4970-2009	Requirement Controls Under AS 4970-2009	Encroachment	Mitigation Controls
No Encroachment 0%	N/A	None	N/A
Minor Encroachment <10%	<ul style="list-style-type: none"> The area lost to encroachment should be made up elsewhere, contiguous with the TPZ 	Minor Encroachment <10%	<ul style="list-style-type: none"> The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ Tree protection must be installed
Major Encroachment >10%	<ul style="list-style-type: none"> The project Arborist must demonstrate the tree(s) would remain viable Root investigation by non-destructive methods may be required Consideration of relevant factors root location and distribution, tree species, condition, site constraints and design factors The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ 	Major Encroachment >10%	<ul style="list-style-type: none"> The project Arborist must demonstrate the tree(s) would remain viable The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ Non-destructive root investigation may be required for any trees proposed for retention The project Arborist will be required to supervise any works within the TPZ Tree protection must be installed
		Total Encroachment 100%	<ul style="list-style-type: none"> Subject trees cannot be retained

Figure 4 Encroachment table

Encroachments

ID	Botanical name	Height (M)	Spread (M)	health	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH (MM)	TPZ (M)	SRZ (M)	Encroachment	Other notes	Proposed outcome
1	<i>Angophora costata</i>	20m	12	Good	Mature	High	Long	High	750	9.0	3.0	Total	Healthy tree on moderate lean, girdling root, large buttress roots	Remove
2	<i>Angophora costata</i>	17m	8	Decline	Mature	Medium	Short	Low	770	9.24	3.0	Major	Tree in decline	Remove or prune tree to a low hazard rating to accommodate local habitat

Tree retention

- **T1** recorded a high significance rating and long ULE, though under the current proposal **T1** will suffer 100% encroachment into its TPZ, **T1** cannot be retained under the current proposal and will require removal to facilitate the build proposal
- **T2** is in decline, this tree could be removed to allow room for another tree planting and to prevent future hazards, from falling branches to structural failure. Harwood Tree Care and Consulting also seeks to inform our client that removing a dead tree is often more costly and increases the risk of the personal safety of the Arborist removing the tree. **T2** could also be pruned back to its main central trunk and be left as a habitat tree for local wildlife – this is a common practice within the industry and often requested by some Councils.

Recommendations

- Remove **T1** to facilitate the proposed build
- Remove or prune **T2** in the near future to prevent future hazards from decaying, dying branches, and minimise risk to the climbing Arborist performing the works
- Replant a total of **2** trees where feasible, taking into account future growth.
- Consider stump removal to discourage white ant nesting
- Ensure that the contractor who is removing the trees is a minimum cert3 Arborist and fully insured:
- Ensure Arborist complies with the rules and regulations set out in:
 1. *Australian Standards 4373-2007 Amenity Tree Works*
 2. *Australian Standards 4970-2009 Protection of Trees on Construction Sites*
 3. NSW WorkCover Code of Practice for the Amenity Tree Industry (1998)
- Replant **2** appropriate species where possible and follow planting diagram located in **Appendix III Tree planting diagram**
- Suggested planting list:
 1. *Xanthostemon chrysanthus*
 2. *Casaurina torulosa*
 3. *Corymbia eximia*
 4. *Corymbia gummifera*
 5. *Eucalyptus crebra*
 6. *Angophora costata/florabunda*
 7. *Elaeocarpus reticulatus*
 8. *Syzygium paniculatum*
 9. *Eucalyptus saligna*
 10. *Alloxylon flammeum*

conclusion

- **T1** could be removed to facilitate the build proposal, retention under the current proposal is not possible
- Remove or prune **T2** in the near future to prevent future hazards from decaying, dying branches, and minimise risk to the climbing Arborist performing the works
- Replant a total of **2** trees where feasible, taking into account future growth.
- Ensure Arborist complies with the rules and regulations set out in:
 1. *Australian Standards 4373-2007 Amenity Tree Works*
 2. *Australian Standards 4970-2009 Protection of Trees on Construction Sites*
 3. NSW WorkCover Code of Practice for the Amenity Tree Industry (1998)
- Follow planting diagram located in **Appendix VIII Tree planting diagram**

Appendix I – Tree Protection Plan

Tree protection fencing

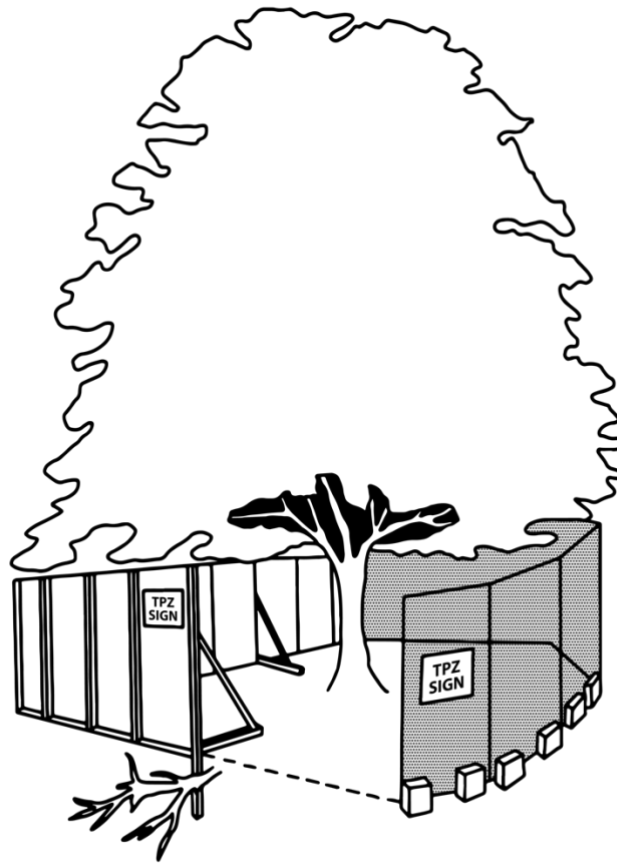


Figure 5 Tree protection fencing

Tree protection fencing must be installed prior to site establishment and remain intact until completion of works, the correct installation and area to be covered is detailed in this report. Once erected, protective fencing must not be removed or altered without the approval of the project arborist, maintaining protective fencing is the responsibility of the primary contractor.

Tree protection fencing shall be:

- Enclosed to the full extent of the TPZ (or as specified in the Recommendations and Tree Protection Plan).
- Temporary mesh panel fencing (minimum height 1.8m).
- Certified and inspected by the project arborist.
- Installed prior to the commencement of works.
- Prominently signposted with 300mm x 450mm boards stating, "NO ACCESS - TREE PROTECTION ZONE". If tree protection fencing cannot be installed due to sloping or uneven ground, tree protection barriers must be installed as an alternative.

Specifications for tree protection barriers are as follows:

- Star pickets spaced at 2m intervals,
- Connected by a continuous high-visibility barrier/hazard mesh.
- Maintained at a minimum height of 1m. Where approved works are required within the TPZ, fencing may be setback to provide construction access. Trunk, branch and ground protection shall be installed and must comply with AS 4970-2009, Protection of Trees on Development Sites. Any additional construction activities within the TPZ of the subject trees must be assessed and approved by the project arborist. Trunk protection Where provision of tree protection fencing is impractical or must be temporarily removed, trunk protection shall be installed to avoid accidental mechanical damage. Specifications for trunk protection are as follows:
 - A thick layer of carpet underfelt, geotextile fabric or similar wrapped around the trunk to a minimum height of 2m.
 - 1.8m lengths of softwood or hardwood timbers aligned vertically and spaced evenly around the trunk (with a small gap of approximately 50mm between the timbers).
 - The timbers must be secured using galvanised hoop strap (aluminium strapping). The timbers shall be wrapped around the trunk but not fixed to the tree, as this will cause injury/damage to the tree.

Tree and Ground protection

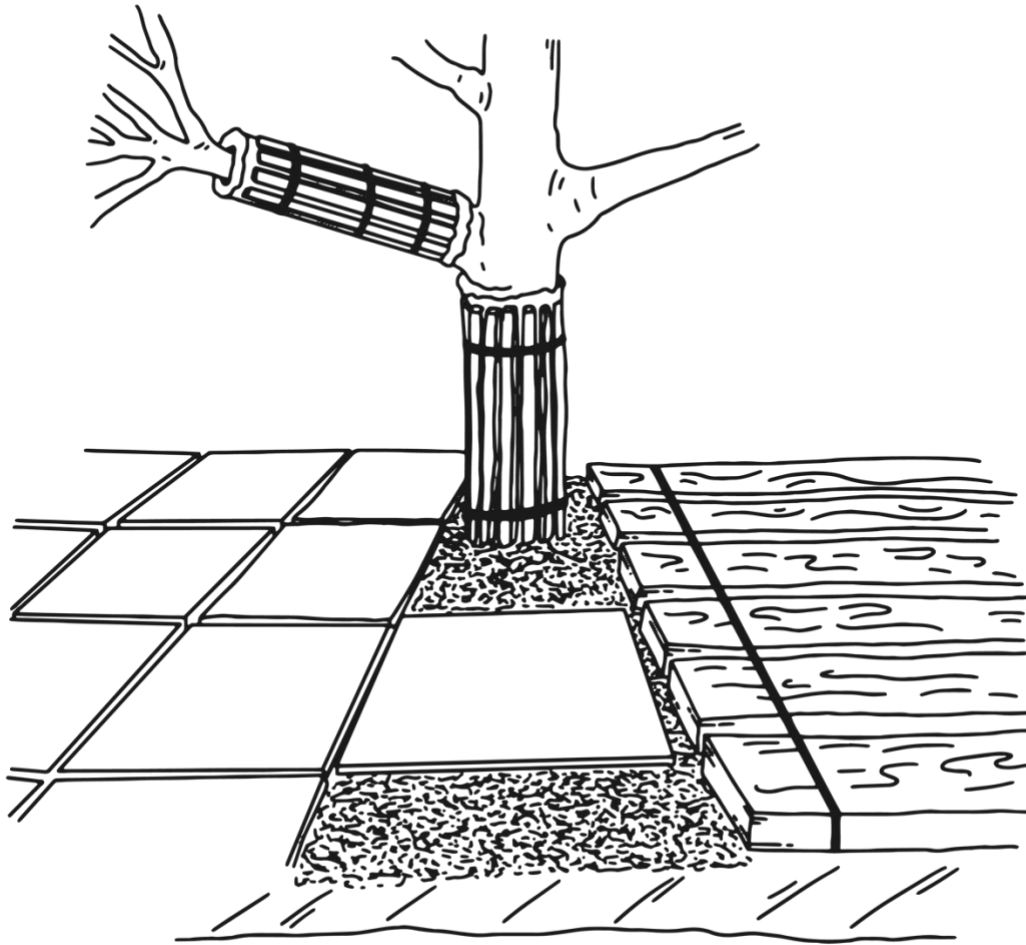


Figure 6 trunk, cambium and branch protection with ground protection methods and examples

If temporary access for vehicle, plant or machinery is required within the TPZ, ground protection and cambium, trunk and branch protection shall be installed. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Where possible, areas of existing pavement shall be used as ground protection.

Specifications for light traffic access (2.5t) are as follows:

- Permeable membrane such as geotextile fabric.
- Layer of native mulch at a minimum depth of 100mm

Specifications for heavy traffic access (>2.5t)

- Permeable membrane such as geotextile fabric
- Layer of lightly compacted road base (at minimum depth of 200mm)
- Geotextile fabric shall extend a minimum 300mm beyond the edge of the road base.

Pedestrian, vehicular and machinery access within the TPZ shall be restricted solely to areas where ground protection has been installed.

Excavations

All approved excavations (including root investigations) within the TPZ must be carried out using tree sensitive methods under supervision of the project arborist. These methods may include:

- Manual excavation (hand tools).
- Air spade.
- Hydro-vacuum excavations

Where approved by the project arborist, excavations using compact machinery is permissible. Excavations using compact machinery shall be undertaken carefully and guided by the Project Arborist who is to supervise all works and prevent any damage to roots and tree trunk.

Exposed roots shall be protected from direct sunlight and drying out by covering with wet geotextile fabric (where practical). No over-excavation, battering or benching shall be

undertaken beyond the footprint of any structure unless approved by the project arborist.

Hand excavation and root mapping shall be undertaken along excavation lines within the TPZ prior to the commencement of mechanical excavation (to prevent tearing and shattering of roots from excavation equipment). Any roots found during excavation shall be pruned by arborist. All root pruning must be documented and carried out by the project arborist.

Underground services

All underground services should be routed outside of the TPZ. If underground services need to be installed within the TPZ, they must be installed using tree sensitive excavation methods under supervision of the project arborist. Alternatively, boring methods such as horizontal directional drilling (HDD) may be used for underground service installation, providing the installation is at minimum depth of 800mm below grade. Excavations for entry/exit pits must be located outside the TPZ

Appendix II – Tree Protection Zones

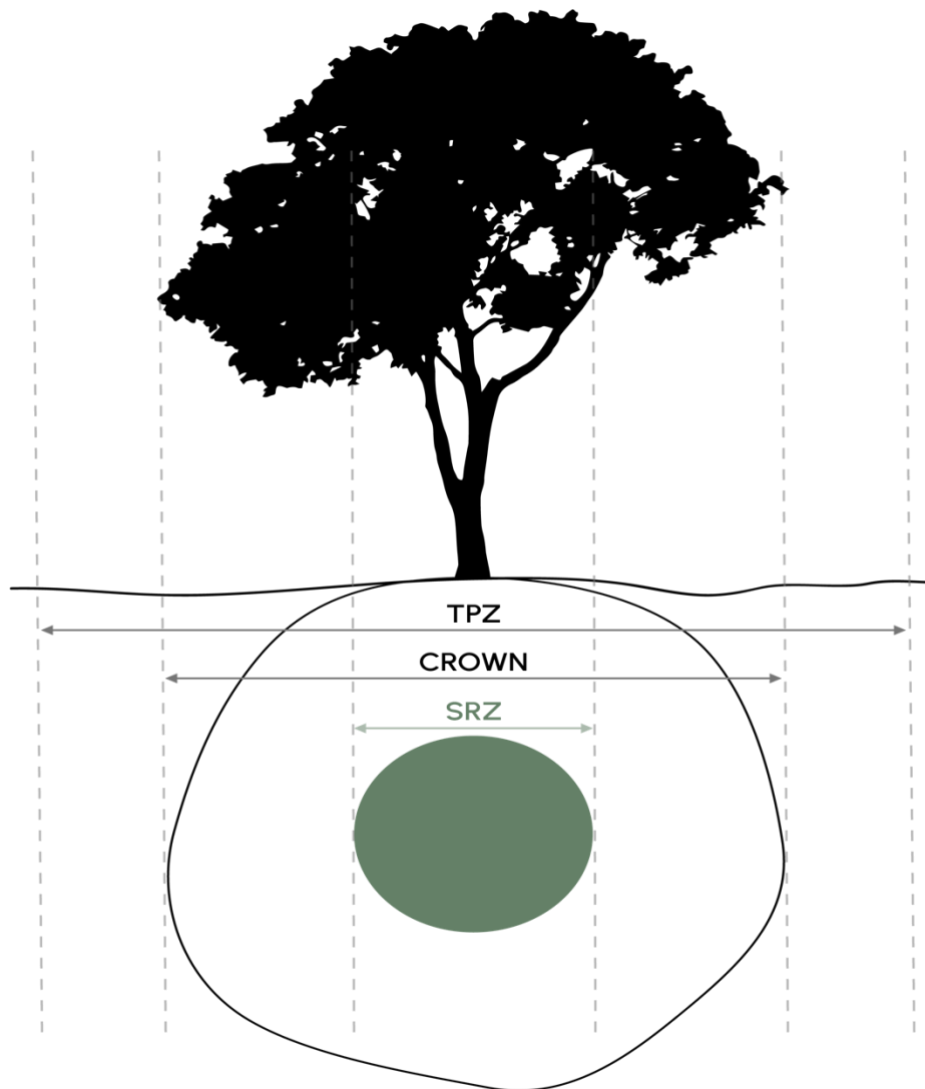


Figure 7 TPZ diagram indicating SRZ and TPZ

$$\text{TPZ (Radius)} = \text{DBH} \times 12$$

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

- The Australian Standards provides a formula for calculating both the TPZ and SRZ. the TPZ is a combination of both root and crown area 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 TPZ's 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. The standards allow for 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

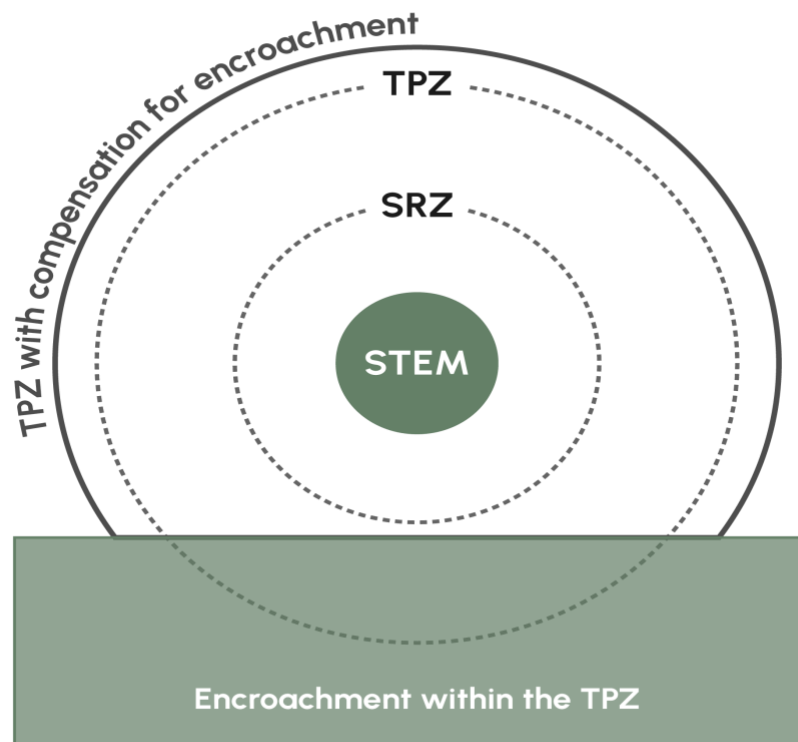


Figure 8 TPZ encroachment and offset area

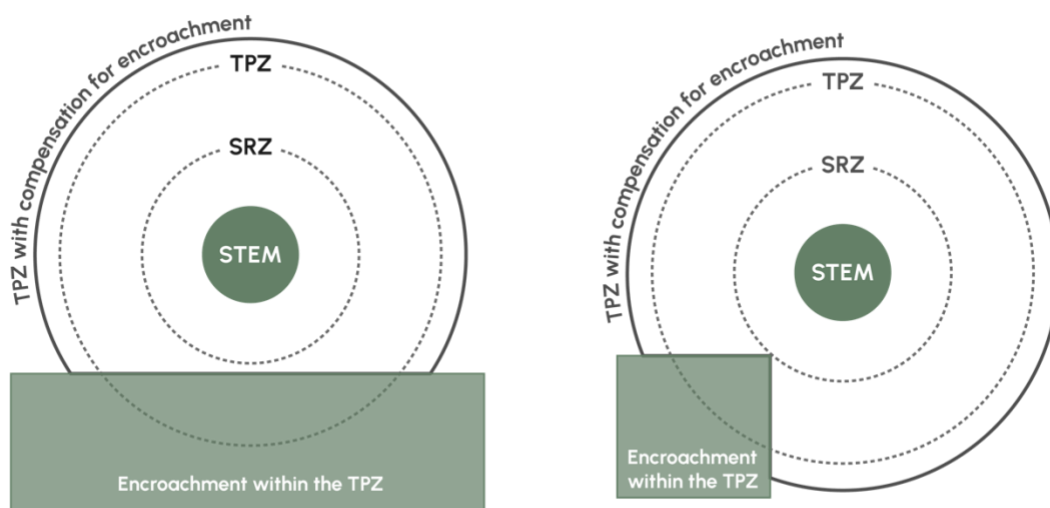


Figure 9 TPZ encroachment and offset example 2

Appendix III – stars tree significance and retention values

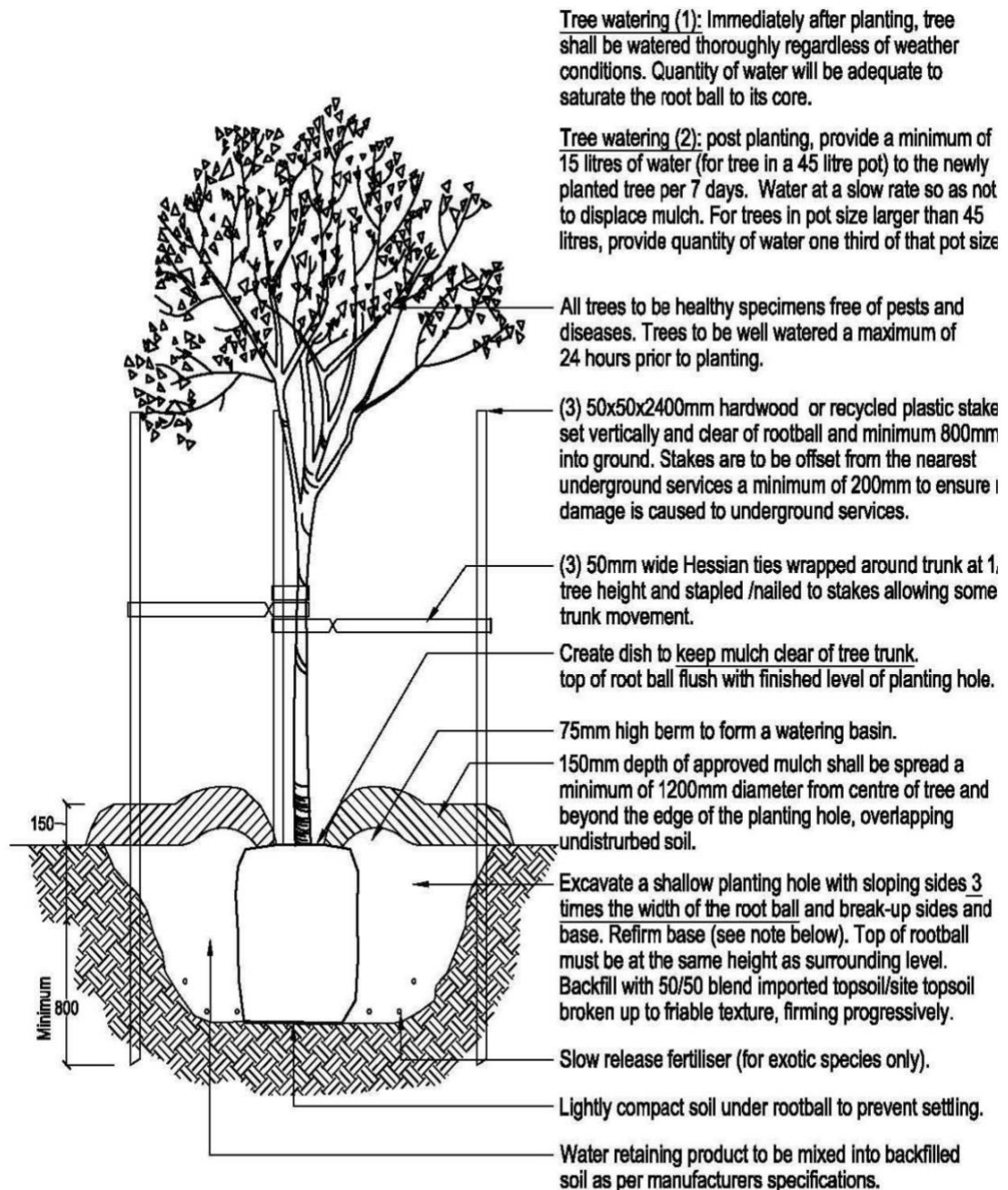
Tree Significance - Assessment Criteria - STARS®		
Low	Medium	High
<p>The tree is in fair-poor condition and good or low vigour.</p> <p>The tree has form atypical of the species</p> <p>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings</p> <p>The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area</p> <p>The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen</p> <p>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</p> <p>The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms</p> <p>The tree has a wound or defect that has the potential to become structurally unsound.</p> <p>The tree is an environmental pest species due to its invasiveness or poisonous/allergenic properties.</p> <p>The tree is a declared noxious weed by legislation</p>	<p>The tree is in fair to good condition</p> <p>The tree has form typical or atypical of the species</p> <p>The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area</p> <p>The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street</p> <p>The tree provides a fair contribution to the visual character and amenity of the local area</p> <p>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</p>	<p>The tree is in good condition and good vigour</p> <p>The tree has a form typical for the species</p> <p>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.</p> <p>The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on councils' significant tree register</p> <p>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.</p> <p>The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.</p> <p>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.</p>

Useful Life Expectancy - Assessment Criteria			
Dead	Short	Medium	Long
<p>Trees with a high level of risk that would need removing within the next 5 years.</p> <p>Dead trees.</p> <p>Trees that should be removed within the next 5 years.</p> <p>Dying or suppressed or declining trees through disease or inhospitable conditions.</p> <p>Dangerous trees through instability or recent loss of adjacent trees.</p> <p>Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form.</p> <p>Damaged trees that considered unsafe to retain.</p> <p>Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.</p> <p>Trees that will become dangerous after removal of other trees for the reasons.</p>	<p>Trees that appear to be retainable with an acceptable level of risk for 5-15 years.</p> <p>Trees that may only live between 5 and 15 more years.</p> <p>Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals.</p> <p>Trees that may live for more than 15 years but would be removed during the course of normal management for safety or nuisance reasons.</p> <p>Storm damaged or defective trees that require substantial remedial work to make safe, and are only suitable for retention in the short term.</p>	<p>Trees that appear to be retainable with an acceptable level of risk for 15-40 years.</p> <p>Trees that may only live between 15 and 40 more years.</p> <p>Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals.</p> <p>Trees that may live for more than 40 years but would be removed during the course of normal management for safety or nuisance reasons.</p> <p>Storm damaged or defective trees that require substantial remedial work to make safe, and are only suitable for retention in the short term.</p>	<p>Trees that appear to be retainable with an acceptable level of risk for more than 40 years.</p> <p>Structurally sound trees located in positions that can accommodate future growth.</p> <p>Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery.</p> <p>Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.</p>

Tree Significance					
Useful Life Expectancy		High	Medium	Low	
	Long >40 years				
	Medium 15-40 years				
	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 Protection of trees on development sites. Tree sensitive construction measures must be implemented 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 the 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.
	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.

Appendix III Tree planting diagram



Glossary

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 trunk 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 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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