

treeREPORT.



Project name: 16 Terry Road, EASTWOOD

Project number: CEN23.1411

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Report type: Arboricultural Impact Assessment

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Version 1	08.12.2023	- Updated assessment of Subject Trees id. 2, 3 & 6. - Removed Subject Trees id. 5 & 7.
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Abbreviations

∅	Diameter
R	Radius
AGL	Above Ground Level
AQF	Australian Qualifications Framework
AS	Australian Standards
BGL	Below Ground Level
DBH	Diameter at Breast Height
DBR	Diameter at Root Flare
Id	Identification
m	Metre
mm	Millimetre
NDE	Non-Destructive Excavation
NO	Number
NSW	New South Wales
SP	Species
SRZ	Structural Root Zone
TPZ	Tree Protection Zone
VTA	Visual Tree Assessment

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1 Background

Introduction

Tree Report has been engaged by The Trustee for Y&D TRD Trust (herein referred to as the 'Client') to prepare an Arboricultural Impact Assessment (herein referred to as the 'AIA') and Tree Protection Plan (herein referred to as the 'TPP') for a proposed development (herein referred to as the 'Project') located at within the within a residential property (herein referred to as the 'Study Area'). The purpose of this report is to:

- Identify trees (herein referred to as the 'Subject Tree' or 'Subject Trees') which are likely to be affected by the Project.
- Assess the current overall health and condition of the Subject Trees.
- Assess and discuss likely impacts to the Subject Trees as a result of the Project.
- Evaluate the significance of the Subject Trees and assess its suitability for retention.

Project Overview

Key features of the Project, likely to affect the Subject Trees, are summarised as follows:

- Site preparation activities, including demolition of the existing dwelling structure and excavations.
- Construction of new single storey (above ground) childcare facility.
- Plant movements.
- Associated landscaping works.

Subject Trees

Inspection of the site was undertaken on the 7th of November 2023. A total of **eight** individual trees (**id. 1-4, 6 & 8-10**) were identified and documented for assessment within this report. Of these:

- **Eight** individual Subject Trees (**id. 1-4, 6 & 8-10**) are of medium retention value.

Further information, observations, and measurements specific to the Subject Trees can be found in Section 4 and Appendix II.

Study Area

The Study Area comprises of vegetation situated within and adjacent to an irregular parcel of land (known as 16 Terry Road, Eastwood NSW 2122). The Study Area is bounded by Terry Road to the north and low & medium density residential lands to the east, south & west.

The Study area is located within the City of Ryde Council LGA.

*The Project alignment is mapped in **Figure 1.1**.*

Study Area

Legend

- Study Area
- LOT -
- Ryde LGA



Figure 1.1: The Study Area

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16 Terry Street,
Eastwood NSW 2122

Prepared by: Lex Atkins
Project Manager: Lex Atkins
Date: 07/11/2023

2 Method

Visual Tree Assessment

Inspection of the Subject Tree(s) should be undertaken prior to the commencement of planned works. Subject Trees should be assessed in accordance with a stage one visual tree assessment (herein referred to as 'VTA') as formulated by Mattheck & Breloer (1994)¹, and practices consistent with modern arboriculture.

The following limitations apply to this methodology:

- VTA is undertaken by a minimum AQF Level 5 (Arboriculture) Arborist (herein referred to as the 'Project Arborist').
- Subject Tree(s) are inspected from ground level, without the use of any invasive or diagnostic tools and testing.
- Trunk Diameter at Breast Height (DBH) are accurately measured using a diameter tape measure.
- Tree height and canopy spread may be estimated.
- Tree identification is 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. Further details and the assessment criteria are in **Appendix V**.

Tree Protection Zone

The designated Tree Protection Zone, (herein referred to as 'TPZ') stands as the industry best practice for safeguarding trees within development premises. This zone encompasses both the Structural Root Zone (herein referred to as 'SRZ') and the living canopy, both of which necessitate preservation. It constitutes a demarcated region shielded from any construction undertakings, ensuring the continued health and viability of the tree.

¹ VTA 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).

Determining the TPZ

The radius of the TPZ is calculated for each tree by multiplying its Diameter at Breast Height (herein referred to as 'DBH') by 12.

$$\text{TPZ} = \text{DBH} \times 12$$

where

DBH = trunk diameter measured at 1.4 m above ground level

TPZ radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2 mR nor greater than 15 m (except where crown projection is required). Refer to **Appendix III** for variations to the TPZ.

The TPZ of palms (or other monocots), cycads and tree ferns should not be less than 1 m outside crown projection.

Structural Root Zone

The SRZ is the area of the root system (as defined by *AS 4970-2009*) used for stability, mechanical support and anchorage of the tree. Severance of structural roots (>50 mm in diameter) within the SRZ is not recommended as it may lead to the destabilisation and/or decline of the tree.

Determining the SRZ

There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks, footings and retained earth structures. An indicative SRZ radius can be determined from trunk diameter measured immediately above the root buttress using the following formula:

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

where

D = trunk diameter, in metres, measured above the root buttress

Note: The SRZ for trees with a trunk diameter less than 0.15mR will be 1.5 mR.

Root investigations

When assessing the potential impacts of encroachment within the TPZ, consideration will need to be given to the location and distribution of the roots, including above or below ground restrictions affecting root growth. Location and distribution of roots may be determined through non-destructive excavation (herein referred to as 'NDE') methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation. Root investigation is used to determine the extent and location of roots within the zone of conflict. Root investigation does not guarantee the retention of the tree.

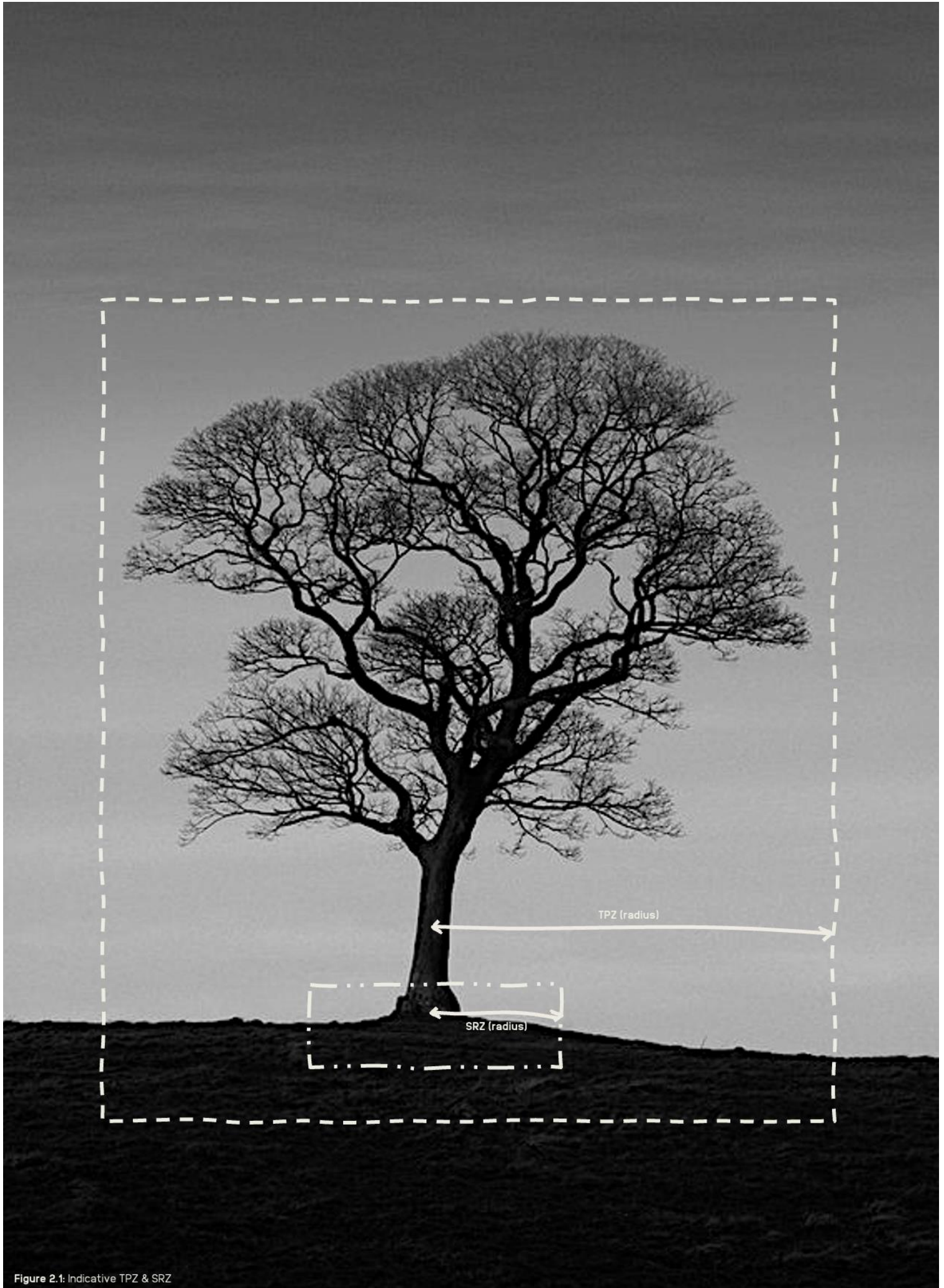


Figure 2.1: Indicative TPZ & SRZ

Encroachments within the TPZ

- **No encroachment (0%):** No likely or foreseeable encroachment within the TPZ.
- **Minor encroachment (<10%):** If the proposed encroachment is less than 10% (total area) of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ.
- **Major encroachment (>10%):** If the proposed encroachment is greater than 10% (total area) of the TPZ, the project arborist must demonstrate that the tree(s) remain viable. The area lost to this encroachment should be compensated for elsewhere and be contiguous with the TPZ. Tree sensitive construction techniques may be used for minor works within this area providing no structural roots are likely to be impacted, and the project arborist can demonstrate that the tree(s) remain viable. Root investigation by non-destructive methods may be required for proposed works within this area. All work within the TPZ must be carried out under the supervision of the project arborist.

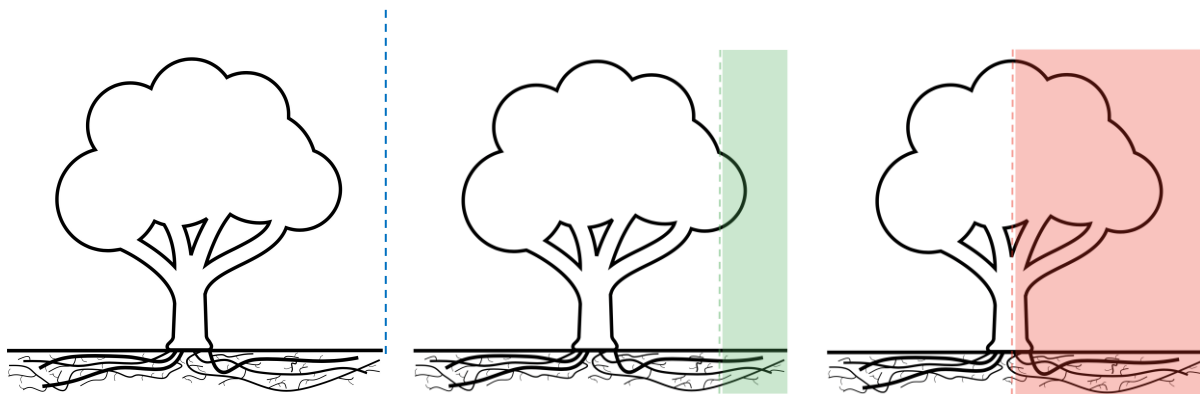


Figure 2.2: Indicative levels of encroachment

Mitigation Measures

Encroachment within the TPZ must be compensated with a range of mitigation measures to ensure that impacts to the subject tree(s) are reduced or restricted wherever possible. Mitigation must be increased relative to the level of encroachment within the TPZ to ensure the subject tree remain viable. The table below outlines requirements under AS 4970-2009, and mitigation measures required within each category of encroachment. These mitigation measures will only apply if trees are proposed to be retained.

Level of Encroachment	Requirements Under AS 4970-2009
No encroachment (0%)	<ul style="list-style-type: none">N/A
Minor encroachment (<10%)	<ul style="list-style-type: none">The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.Detailed root investigations should not be required.Tree protection must be installed.
Major encroachment (>10%)	<ul style="list-style-type: none">The project arborist must demonstrate the Subject Tree(s) would remain viable.Root investigation by non-destructive methods may be required.Consideration of relevant factors including: 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.Non-destructive root investigation may be required for any trees proposed for retention.

Table 2.1: Mitigation measures

3 Discussion

General

Trees on development sites: Construction and development can change the way an area is utilised by adding buildings, infrastructure, and pedestrians to the location. This can result in an increased potential of damage and harm to property and people. Therefore, trees that contain significant defects, are structurally poor or have a short useful life expectancy should be considered for removal.

Furthermore, it is not always possible or reasonably practicable to retain all trees within a proposed development. It can be better to select the higher retention value trees and protect these well, rather than trying to retain all trees and decreasing the quality of tree protection (Matheny & Clark, 1998).

Trees can be negatively affected in a number of ways during construction. These include root loss, lack of water and oxygen to the root zone, damage to the trunk or canopy and/or poisoning. Failure to protect trees, particularly root zones, during development can lead to an increased risk of tree death and/or failure post construction.

Impacts from excavation: Most tree roots will usually be found in the top 600mm of soil (Harris, Clark & Matheny, 1999). Radiating outwards from the base of the trunk are several large woody roots. These structural roots anchor the tree in the ground. Cutting or affecting those roots is likely to undermine the stability of the tree. The spread of a tree's structural roots, herein termed its Structural Root Zone (SRZ), is generally proportioned to the diameter of its trunk (Matthek & Breloer, 1994).

Beyond this zone extends the network of woody transport roots and fine absorbing roots, which absorb and transport water and nutrients. Most of these roots are found in the top 150mm of soil (Harris, Clark & Matheny, 1999). Trees can lose a portion of their absorbing roots without being significantly affected in the long term. Different species tolerate different amounts of root loss, with most healthy trees able to tolerate losing up to a third of their absorbing roots (Matheny & Clark, 1998).

Impacts from canopy pruning: Tree canopy pruning involves the removal of living and dead tissues in an attempt to control or redistribute growth and to create a structurally sound mature form. Tree health and the ability to recover from the myriad of urban stressors are directly related to canopy area. The loss of live foliage and woody transport tissue can lead to a significant negative impact a Subject Tree's ability to photosynthesise light energy into chemical energy necessary for the normal physiological functioning and survival of the tree. Live crown ratios of 50%-60% maintain tree vitality while reducing the risk of premature limb/tree failure.

The cutting of branches which results in a stub, referred to as lopping is regarded as an unacceptable practice, except in certain circumstances. Lopping may result in:

- An increased rate of shoot production and elongation, which is weakly attached to the parent tree.
- Decay of the stubs.
- Poor form and visual amenity.
- Reduced life expectancy of the tree.
- Pre-disposing the tree to pathogenic infection and insect attack.

Based on the afore-mentioned factors, a Subject Tree will be recommended for removal where there is an encroachment of >20% total TPZ area or an encroachment of the SRZ.

4 Results

Major (>10%) TPZ and/or SRZ Encroachment

Retain: One Subject Tree (id. 8) is located adjacent to the Project and has been identified by the assessment for retention. Excavations required to facilitate the Project will result in a major encroachment (10-20%) of the TPZ and are located outside of the SRZ. As such, the Project is unlikely to have a significant impact on the Subject Trees' ability to store carbohydrates, use stored carbohydrates in times of stress and is unlikely to have a significant impact on the health, condition and/or stability of the Subject Tree long term.

Possibility to Retain: A total of three Subject Trees (id. 2, 3 & 6) are located adjacent to the proposed Project and/or 0.5 m disturbance buffer and will be subject to a major (>10%) encroachment of the TPZ and/or SRZ.

Subject Tree id. 2:

- Existing grounds levels are proposed to be maintained within the SRZ.
- Non-Destructive Excavations are proposed to be undertaken within the TPZ to assess extent and location of conflicting root material.

Subject Tree id. 3 & 6:

- Existing retaining wall structure, situated between the Subject Trees and the Project, is likely to be acting as a root barrier and preventing root ingress into the site.
- Non-Destructive Excavations are proposed to be undertaken within the TPZ to assess extent and location of conflicting root material.

Minor (<10%) TPZ Encroachment

Retain: One Subject Tree (id. 10) is located adjacent to the Project and will incur a minor TPZ encroachment of <10%.

Minor encroachments are considered acceptable under the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites* and are unlikely to have a significant impact on the Subject Tree's ability to store carbohydrates, use stored carbohydrates in times of stress and are unlikely to have a significant impact on the health, condition and/or stability of the Subject Tree long term.

No TPZ Encroachment

Retain: Three Subject Trees (id. 1, 4 & 9) are located outside of the proposed area of disturbance and there are no foreseeable impacts to the Subject Trees as a result of the Project.

5 Recommendations

Tree Recommended for Removal

None of the Subject Trees are recommended for removal as a result of the Project.

Trees Recommended for Retention

Major (>10%) TPZ Encroachment: Subject Tree **id. 8** will be subject to a major encroachment of the TPZ (but outside of the SRZ) as a result of the Project. Impact mitigation measures are required for successful tree retention; tree protection (refer to **Chapter 6** and **Appendix III**) should be implemented to protect the Subject Tree during the construction phase of the development.

Minor (<10%) TPZ Encroachment: Subject Tree **id. 10** will be subject to a minor impact as a result of the proposed development. Impact mitigation measures are not required for successful tree retention; **however**, tree protection (refer to **Chapter 6** and **Appendix III**) should be implemented to protect the Subject Tree during the construction phase of the development.

No encroachment: Subject Trees **id. 1, 4 & 9** are located outside the proposed area of disturbance and there are no foreseeable impacts to these trees as a result of the proposed development. Impact mitigation measures are not required for successful tree retention; **however**, tree protection (refer to **Chapter 6** and **Appendix III**) should be implemented to protect the Subject Trees during the construction phase of the development.

Possibility to Retain

Major (>10%) TPZ Encroachment: Subject Tree **id. 2, 3 & 6** will require further investigations in order to determine the suitability for retention in the form of root mapping and assessment within the SRZ. Impact mitigation measures are required for successful tree retention, and tree protection (refer to **Chapter 7** and **Appendix III**) should be installed to protect the Subject Trees during the construction phase of the development.

Tree Removal

- Any approved tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- Any approved tree removal work is to be carried out in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).
- Permission must be granted from the relevant consent authority, prior to removing any of the Subject Trees.

Tree Canopy Pruning

Should the need for canopy pruning arise, the following is recommended:

- Pruning must not exceed 10% total live canopy volume.
- No living tissue >50mmØ is to be removed.
- Any approved pruning must be in accordance with *AS 4373-2007, Pruning of Amenity Trees*.
- Permission must be granted from the relevant consent authority, prior pruning of any of the subject trees.
- Final pruning cuts are achieved as close as possible to the branch collar without cutting into the branch collar or leaving a protruding stub.
- Any approved pruning and/or tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.

- Any approved pruning tree work is to be carried out in accordance with the *NSW WorkCover Code of Practice for the Amenity Tree Industry (1998)*.

Where required canopy pruning is unable to be undertaken in accordance with the above specifications, an individual tree pruning specification must be prepared by the project arborist on a case-by-case basis.

6 Tree Protection Plan

General Tree Protection Measures

The following general tree protection measures are recommended:

- The approved tree protection plan must be available onsite prior to the commencement of works, and throughout the entirety of the project.
- The Tree Protection Plan must be implemented prior to commencement of construction activities and site establishment.
- Tree protection measures are to be installed in accordance with *AS 4970-2009, Protection of Trees on Development Sites*.
- The area lost to encroachment should be compensated for elsewhere, contiguous with the TPZ (**Appendix IV**).
- All approved works within the TPZ should be installed using tree sensitive methods such as: horizontal directional drilling boring, non-destructive excavation and carried out under the supervision of the project arborist.

Specific Tree Protection Measures

The following specific tree protection measures are recommended:

- If, at any time, it is not feasible to carry out works in accordance with this report, an alternative must be agreed in writing with the Project Arborist.
- It is the responsibility of the Principal Contractor (herein referred to as the 'PC') to install and maintain tree protection measures in accordance with this report for the duration of the development.
- Subject Trees, recommended for retention, are to be protected via the use of tree protection (trunk armour), in accordance with the approved tree protection plan and *AS 4970-2009, Protection of Trees on Development Sites*, and should be installed prior to commencement of construction activities and site establishment.
- All proposed works within the TPZ of Subject Trees to be retained must be carried out under the supervision of the project arborist using tree sensitive techniques and not result in the loss of roots material >40mmØ.
- Where it is not feasible to install tree protection fencing due to unforeseen factors, a modified tree protection specification must be agreed to by the Project Arborist.
- Where possible, footings of existing structures and hardscapes proposed for demolition within the TPZ should remain in situ (just below grade) to prevent damage to existing root material.
- Exposed root material should be clean cut using secateurs, hand saw or similar.
- Structural soil as coarse or slightly coarser than the existing soil should be used for any fill requirements within the TPZ of a Subject Tree proposed for retention.
- Scaffolding / hording should be erected on the existing hardscape or utilise ground protection when situated within the TPZ.

Hold Points, Inspections, and Certification

The approved tree protection plan must be available onsite prior to the commencement of works, and throughout the entirety of the project. To ensure the tree protection plan is implemented, hold points have been specified in the schedule of works (**Table 6.1**). It is the responsibility of the PC to complete each of the tasks.

Once each stage is reached, the work will be inspected and certified by the project arborist and the next stage may commence. Alterations to this schedule may be required due to necessity, however, this shall be through consultation with the project arborist only.

Phase	Stage	Responsibility
Pre-construction	1 Engagement of AQF Level 5 (Diploma of Arboriculture) arborist for the role of project arborist.	PC
	2 Prior to demolition and site establishment indicate clearly with spray paint on trunks trees marked for removal only (if applicable).	PC / Project Arborist
	3 Tree protection shall be installed in accordance with approved tree protection plan and certified by the project arborist prior to demolition and site establishment, this will include mulching of areas within the TPZ.	PC / Project Arborist
During Construction	4 Inspection and certification of trees by the project arborist should be undertaken monthly during the construction period.	PC / Project Arborist
	5 Project arborist to supervise and document all works carried out within the TPZ of trees to be retained.	PC / Project Arborist
	6 Inspection and certification of trees by project arborist after all major construction has ceased, following the removal of tree protection measures.	PC / Project Arborist
Post Construction	7 Final inspection and certification of trees by project arborist.	PC / Project Arborist

Table 6.1: Hold points, inspections & certification schedule

7 References

General References

- *Australian Standard, AS 4373-2007, Pruning of Amenity Trees.*
- *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites.*
- *Harris, R., Clark, J., Matheny, N. and Harris, V. 2004. Arboriculture. Upper Saddle River, N.J.: Prentice Hall.*
- *Lonsdale, D. 1999. Principles of tree hazard assessment and management. London: Stationery Office.*
- *Loughran, A. 2007. Native plant or weed. Paterson, N.S.W.: Tocal College, NSW Dept. of Primary Industries.*
- *Mattheck, C. 2007. Updated field guide for visual tree assessment. Karlsruhe: Forschungszentrum Karlsruhe.*
- *Mattheck, C., Bethge, K. and Weber, K. 2015. The body language of trees. Karlsruhe: Karlsruher Inst. für Technologie.*
- *Mattheck, C., Lonsdale, D. and Breloer, H. 1994. The body language of trees. London: H.M.S.O.*
- *MacLeod, R D. and Cram, W J. 1996. Forces Exerted by Tree Roots, Arboriculture Research Information Note, 134/96/EXT.*
- *Smiley, T. and Fite, K. 2008. Managing Trees During Construction. Arborist News. WorkCover NSW. 1998. Code of Practice: Amenity Tree Industry.*

Specific References

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

- *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017.*
- *City of Ryde Council: Ryde Local Environmental Plan (LLEP) 2014.*
- *City of Ryde Council: Ryde Development Control Plan (RDGP) 2014.*
- *Jansen Designs: Architectural Drawing Set; Proposed Child Care Centre; Project #: 10258; Issue: A, dated 01.09 2023.*
- *Innovative Surveying: Plan Showing Details & Levels Over LOT 1 in DP 324937; Job No.: 700849; Plan No.: 700849_A, dated 01.12.2023.*

Jansen Designs: Proposed Child Care Centre – Ground Floor Plan has been used as a map layer for **Appendix I & III**.

Arboricultural Impact Assessment

Legend

- Indicative Tree Location
- Possibility to Retain
- Retain
- Structural Root Zone
- Tree Protection Zone
- SRZ Encroachment
- TPZ Encroachment
- Study Area
- 0.5 m Disturbance Buffer
- Development Footprint
- LOT - Ryde LGA



16 Terry Road,
Eastwood NSW 2122

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Arboricultural Impact Assessment

Legend

- Indicative Tree Location
- Possibility to Retain
- Retain
- Structural Root Zone
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- SRZ Encroachment
- TIPZ Encroachment
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- 0.5 m Disturbance Buffer
- Development Footprint
- LOT - Ryde LGA



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Date: 06.12.2023

Appendix II **Tree Schedule**

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH 1 (Øm)	DBH 2 (Øm)	DBH 3 (Øm)	Calculated DBH (mØ)	TPZ (Rm)	SRZ (Rm)	Level of Encroachment	TPZ encroachment (%)	Other notes	Proposal
1	<i>Jacaranda mimosifolia</i>	10	10	Good	Fair	Mature	Medium	Medium	Medium	200	200	-	280	3.4	2.4	Nil	0	<ul style="list-style-type: none"> Tree located in neighbouring site. Indicative plan location only. Tree assessed from fence line. 	Retain
2	<i>Acmena smithii</i>	14	12	Good	Fair	Mature	Medium	Medium	Medium	500	-	-	500	6	2.6	Major (>20% + SRZ)	29.77953926	<ul style="list-style-type: none"> Epicormic regrowth. Tree located on fence line. Tree assessed from boundary. 	Possibility to Retain
3	<i>Macadamia tetraphylla</i>	10	8	Good	Fair	Mature	Low	Medium	Medium	150	200	-	250	3	2.4	Major (10-20% + SRZ)	16.65458591	<ul style="list-style-type: none"> Tree located in neighbouring site. Indicative plan location only. Tree assessed from fence line. 	Possibility to Retain
4	<i>Lagerstroemia indica</i>	8	7	Good	Fair	Mature	Low	Medium	Medium	150	150	100	230	2.8	2.4	Nil	0	<ul style="list-style-type: none"> Tree located in neighbouring site. Tree assessed from fence line. 	Retain
6	<i>Lagerstroemia indica</i>	8	7	Good	Fair	Mature	Low	Medium	Medium	150	150	100	230	2.8	2.4	Major (<10% + SRZ)	2.326272799	<ul style="list-style-type: none"> Tree located in neighbouring site. Tree assessed from fence line. 	Possibility to Retain
8	<i>Angophora costata</i>	18	12	Fair	Fair	Mature	Medium	Medium	Medium	600	-	-	600	7.2	2.8	Major (10-20%)	13.16263997	<ul style="list-style-type: none"> Epicormic regrowth. Tree assessed from boundary. 	Retain
9	<i>Jacaranda mimosifolia</i>	8	6	Fair	Fair	Semi-mature	Low	Medium	Medium	200	-	-	200	2.4	1.8	Nil	0	<ul style="list-style-type: none"> Neighbouring tree. Indicative plan location only. Tree assessed from distance. 	Retain
10	<i>Syzygium sp.</i>	7	4	Fair	Fair	Semi-mature	Low	Medium	Medium	150	-	-	150	2	1.7	Minor (<10%)	3.089181517	<ul style="list-style-type: none"> Neighbouring tree. Indicative plan location only. Tree assessed from distance. 	Retain

Appendix III **Tree Protection Plan**

Tree Protection Plan

Legend

- Indicative Tree Location
- Possibility to Retain
- Retain
- Structural Root Zone
- Tree Protection Zone
- SRZ Encroachment
- TPZ Encroachment
- TPP Fencing
- Study Area
- 0.5 m Disturbance Buffer
- Development Footprint
- LOT - Ryde LGA



16 Terry Road,
Eastwood NSW 2122

Prepared by: Lex Atkins
Project Manager: Lex Atkins
Date: 06.12.2023

Tree Protection Plan

Legend

- Indicative Tree Location
- Possibility to Retain
- Retain
- Structural Root Zone
- Tree Protection Zone
- SRZ Encroachment
- TPZ Encroachment
- TPP Fencing
- Study Area
- 0.5 m Disturbance Buffer
- Development Footprint
- LOT - Ryde LGA



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Appendix IV **Tree Protection Specifications**

Tree protection fencing

Tree protection fencing must be installed prior to site establishment and remain intact until completion of works. Once erected, protective fencing must not be removed or altered without the approval of the project arborist.

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".

Existing fencing, site hoarding or structures (such as a wall or building) may be used as tree protection fencing, providing the TPZ remains isolated from construction footprint.

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.

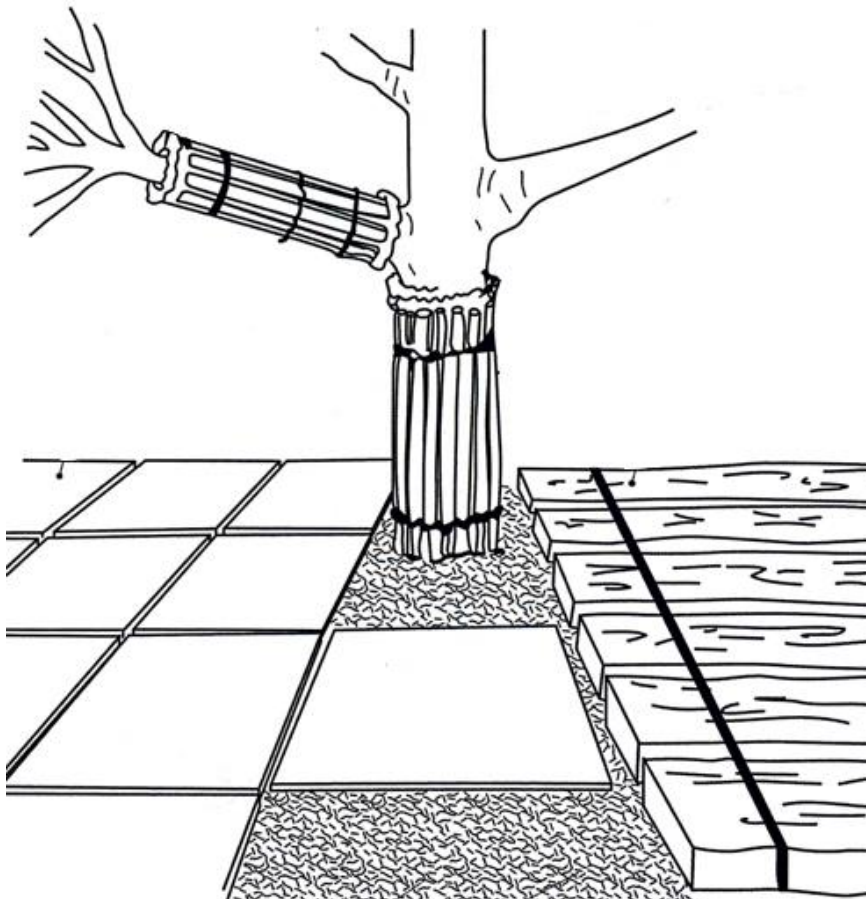


Trunk protection

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 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.



Ground protection

If temporary access for vehicle, plant or machinery is required within the TPZ ground 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 (<3.5 tonne) are as follows:

- Permeable membrane such as geotextile fabric.
- Layer of mulch or crushed rock (at minimum depth of 100mm)

Specifications for heavy traffic access (>3.5 tonne) are as follows:

- 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 (sucker-truck).

Where approved by the project arborist, excavations using compact machinery fitted with a flat bladed bucket is permissible. Excavations using compact machinery shall be undertaken in small increments and guided by the Project Arborist who is to look for and prevent root damage to roots (>50mm in diameter).

Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with geotextile fabric, and plastic membrane or glad wrap (where practical). Coverings shall be weighted to secure them in place. The geotextile fabric shall be kept damp at all times.

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 conflicting roots (>50mm in diameter) shall be pruned using clean, sharp secateurs or a pruning saw to ensure a clean cut, free from tears. 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.

Scaffolding within TPZ

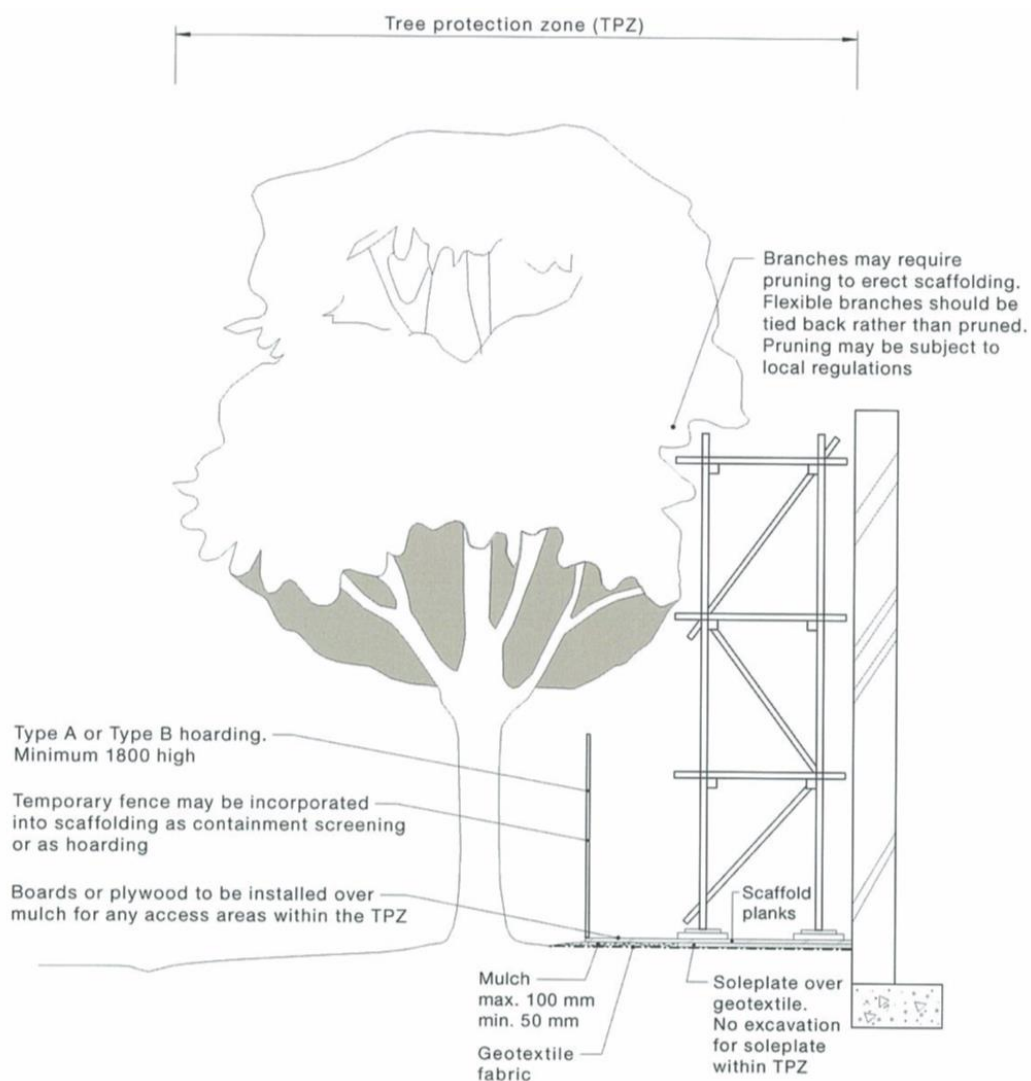
Scaffolding should be erected outside the TPZ. In the event this cannot be avoided due to site constraints, the following clause shall apply.

Scaffolding must be designed to avoid branches or branches tied back with appropriate bindings that will not damage bark tissues. Where pruning is unavoidable it must be undertaken in accordance with AS 4373, specified by the site arborist and approved by the Responsible Authority.

Soil profiles below the scaffolding erected within a TPZ must be protected in accordance with the requirements identified in Ground Protection.

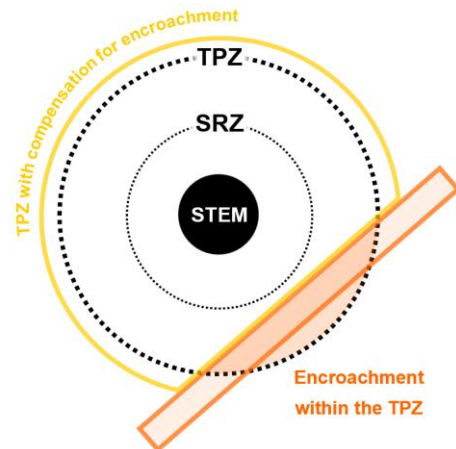
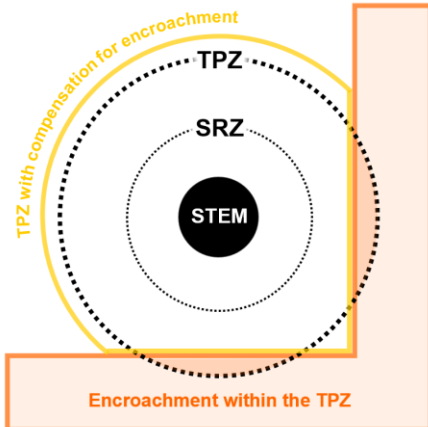
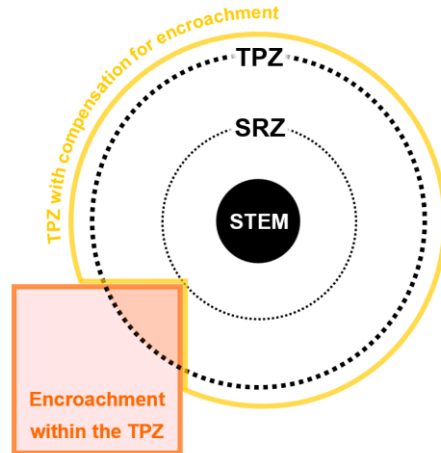
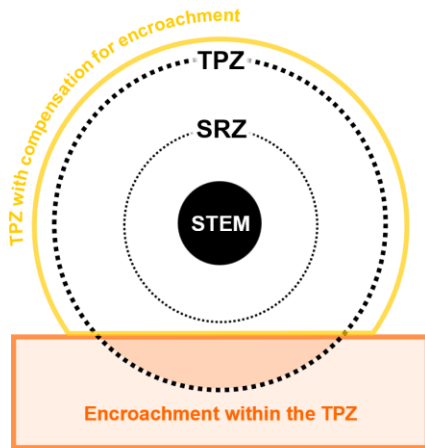
Excavation for the insertion of support posts must not sever roots greater than 20 mm in diameter and must be approved by the Project Arborist. Where soleplates are required within the TPZ to ensure stability, hybrid micro-pile such as Surefoot® are to be used. The system has a low environmental impact relying upon multi-directional, “mini friction” piles of 32mm (nominal) in diameter which are driven into the ground with a handheld jackhammer.

No heavy mechanical equipment is required, therefore significantly reducing compaction of the soil. No excavation, soil removal or stockpiling is required to install the system. Piles can be easily repositioned to avoid significant root structures.



Appendix V **Encroachment within the TPZ**

The images² below show how encroachment within the tree protection zone can be compensated for elsewhere.



² Reference: Council of Standards Australia (August 2009) AS 4970-2009 Protection of Trees on Development Sites Standards Australia, Sydney.

Appendix VI **STARS© Assessment Matrix**

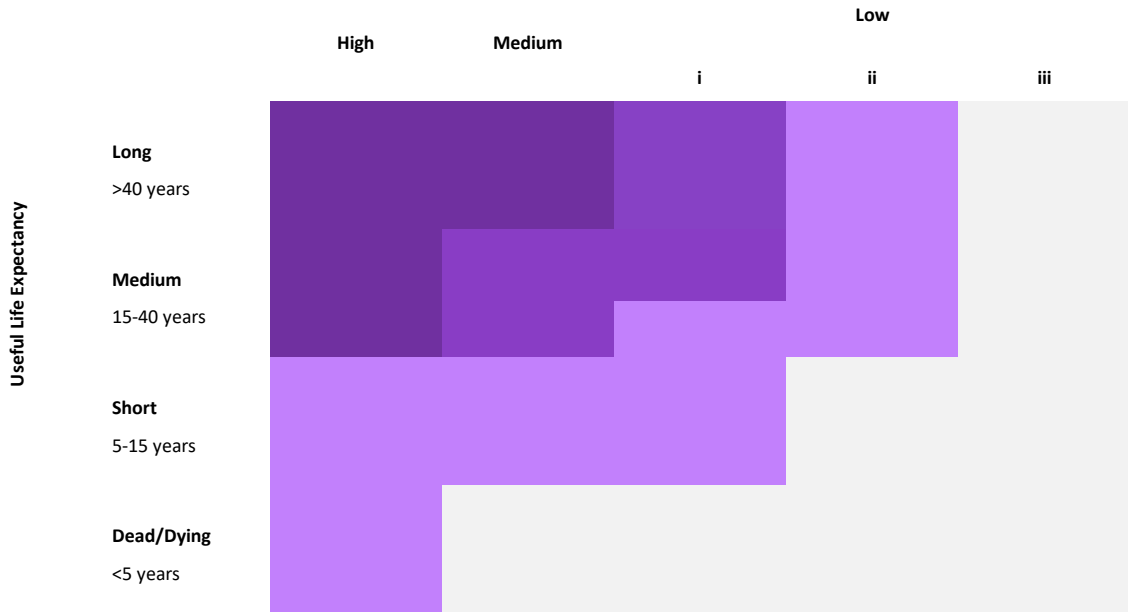
Tree Significance - Assessment Criteria - STARS®

Low	Medium	High
<p>i) Significance in landscape</p>		
<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 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>
<p>ii) Environmental Pest/Noxious Weed Species</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>iii) Hazardous/Irreversible Decline</p>		
<p>The tree is structurally unsound and/or unstable and is considered potentially dangerous</p> <p>The tree is dead, or is in irreversible decline</p>		

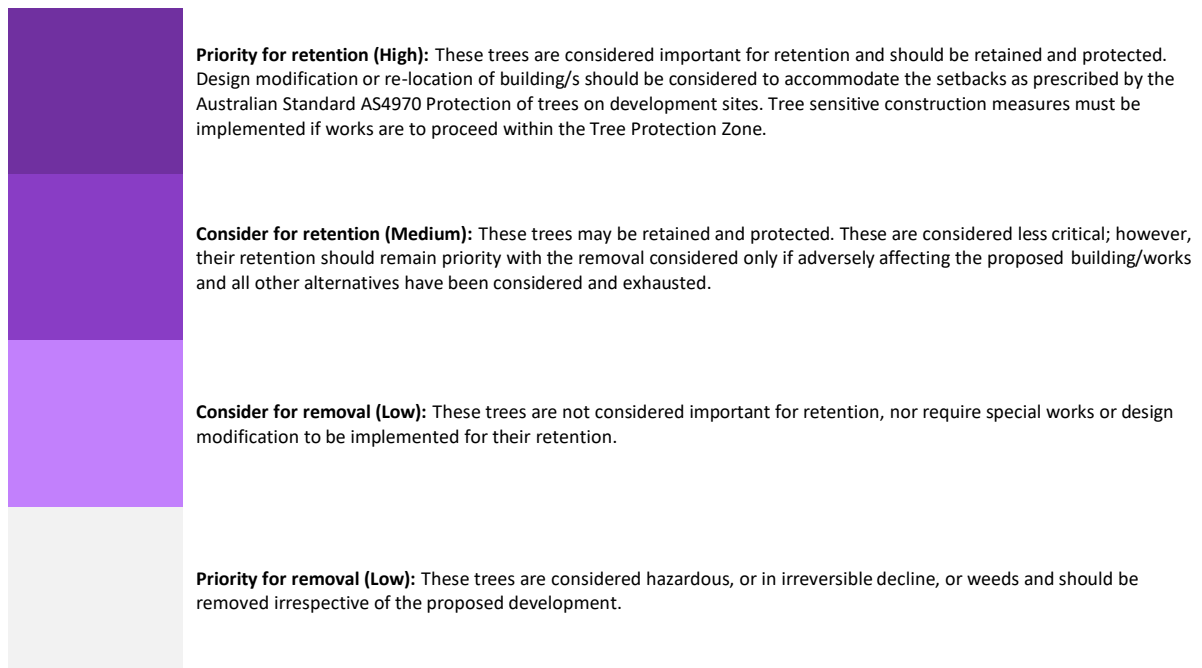
Useful Life Expectancy - Assessment Criteria

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

Tree Significance



Legend for Matrix Assessment



treeREPORT.

