Randwick Racecourse - Arboricultural Impact Assessment

The Australian Turf Club

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Abbreviations

Abbreviation	Description
AQF	Australian Qualifications Framework
AS	Australian Standards
DBH	Diameter at Breast Height
ELA	Eco Logical Australia
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

1. Background

This Arboricultural Impact Assessment was prepared for the Australian Turf Club in relation to the proposed development at Randwick Racecourse. The address of the subject site is in Table 1 and mapped in Figure 1. The purpose of this report is to:

- identify the trees within the site that are likely to be affected by the proposed works
- undertake a visual tree assessment of the subject trees
- assess the current overall health and condition of the subject trees
- evaluate the retention value of the subject trees
- identify trees to be removed, retained or transplanted
- determine the likely impacts on trees to be retained
- recommend tree protection measures to minimise adverse impacts.

Features of the subject site are tabulated below.

Table 1: Subject site

Criteria	Description
Street address	Alison Rd, Randwick NSW 2031
Local Government Area	Randwick City Council
General land use	Racecourse

The description of the proposed activity in Table 2 is based on information available at the time of preparing this report.

Table 2: Proposed activity

Activities that can impact trees	Description of proposed activities
Clearing vegetation	no
Pruning vegetation	no
Earthworks including regrading, excavation and trenching • For building • For services	yes
Compaction • Storage of materials • Installation of structures • Stockpiling fill or materials • Parking	yes
Refuelling and chemical use (e.g. herbicides)	yes
Erection of scaffolding	no
Vehicle movements	Yes
Changes to stormwater management	yes
Landscaping	yes

Figure 1: Subject site

2. Method

2.1 Definition of a tree

A tree is defined under the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites* as a long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks.

Randwick City Council defines a tree as:

"a height equal to or exceeding six (6) m; a canopy width equal to or exceeding four (4) m; for a single trunk tree species, a trunk circumference equal to or exceeding one (1) m at a heights of one (1) m above ground level; or for a multi-trunk tree species, a combined trunk circumference (measured around the outer girth of the group of trunks) equal to or exceeding one (1) m at a height of one (1) m above ground level."

2.2 Visual tree assessment

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

A total of 3 subject trees were inspected on 4 October 2019 by AQF Level 5 Consulting Arborist, David Bidwell.

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 were inspected within limits of site access.
- No aerial inspections or root mapping was undertaken.
- Tree heights, canopy spread and diameter at breast height (DBH) were estimated, unless otherwise stated.
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.

2.3 Retention value

The retention value or importance of a tree or group of trees, is determined in accordance with the Institute of Australian Consulting Arborists (IACA) Significance of a Tree Assessment Rating System (STARS©), which is summarised in Appendix A. The method considers the Useful Life Expectancy (ULE) and landscape significance of a tree. Trees are provided one of the following ratings:

- **High -priority for retention**. These trees are considered important 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 AS 4970–2009 Protection of trees on development sites*.

- **Medium - consider for retention**. These trees are moderately important for retention. Their removal should only be considered if adversely affected by the proposed works and all other alternatives have been considered and exhausted.
- **Low - consider for removal**. These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- **Priority for removal**: Tree not considered important for retention, nor requiring special works or design modification to be implemented for their retention.

2.4 Protection zones

2.4.1 Tree protection zone (TPZ)

The TPZ is a specific area above and below ground and at a distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by the development. The TPZ (as defined by AS 4970-2009) requires restriction of access during the development process. Groups of trees with overlapping TPZs may be included within a single protection area. Tree sensitive measures must be implemented if works are to proceed within the TPZ.

2.4.2 Structural root zone (SRZ)

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. It is critical for the support and stability of trees. Severance of roots within the SRZ is not recommended as it may lead to the destabilisation and/or decline of the tree.

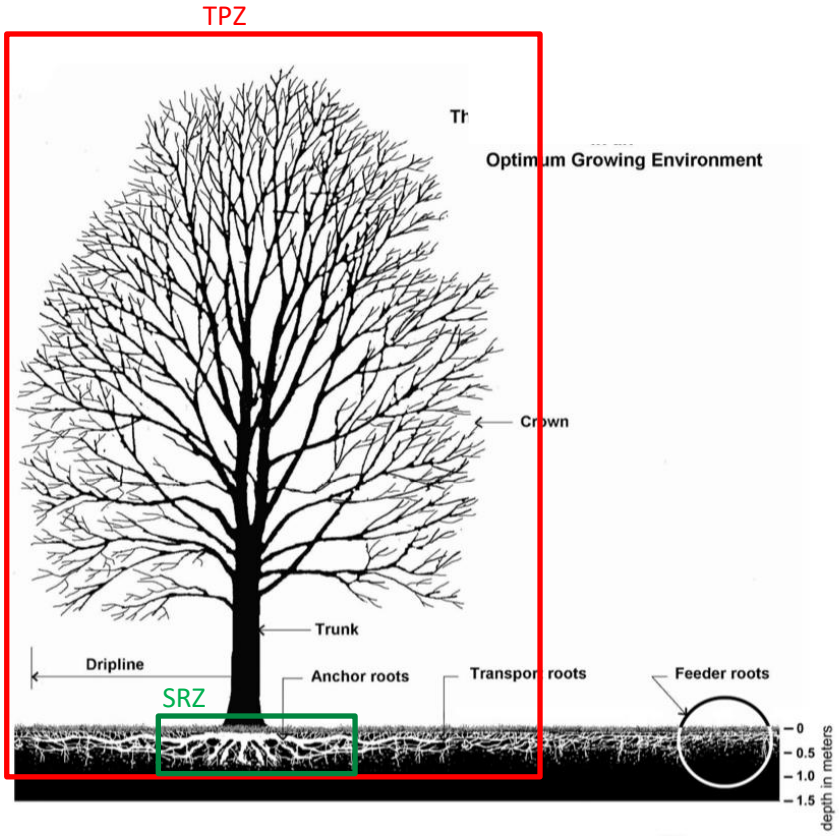

Figure 2: Representative tree structure and indicative TPZ and SRZ

2.5 Potential impacts

Trees may be impacted by physical or chemical damage to roots or above tree parts. Examples include impacts associated with site grading, soil compaction, excavation, stock piling within TPZ as well as changes in site hydrology, changes in soil level and site contamination. The extent of encroachment to the TPZ and SRZ determines the level of potential impact. AS 4970-2009 defines types of encroachment as follows and as illustrated in Appendix B:

- **Major encroachment** - If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable. The location and distribution of roots may be determined through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), Air Spade or manual extraction. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.
- **Minor encroachment** – If the proposed encroachment is less than 10% 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 contiguous with the TPZ.

For the purposes of this Arboricultural Impact Assessment, impacts are defined as follows:

- **High impact:** The SRZ is directly affected or the proposed encroachment is greater than 20% of the TPZ. Trees may not remain viable if they are subject to high impact.
- **Medium impact:** If the proposed encroachment is greater than 10% of the TPZ (but less than 20% of the TPZ) and outside of the SRZ, the project arborist may require detailed root investigation to demonstrate that the tree(s) would remain viable.
- **Low impact:** 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.
- **No impact:** No likely or foreseeable encroachment within the TPZ.

Impacts are calculated using geographic information systems techniques.

3. Results and discussion

Results of the arboricultural assessment are summarised in Table 3 and mapped below.

Table 3: Results of arboricultural assessment

Tree	Botanical Name	Height (m)	Spread (m)	Health	Structure	Retention Value	DBH (mm)	TPZ (m)	SRZ (m)	Impacts
1	*Magnolia grandiflora*	4	4	Poor	Fair	Medium	170	2.04	1.57	High Impact: >20%
2	*Magnolia grandiflora*	4	4	Poor	Fair	Medium	160	2.00	1.53	High Impact: >20%
3	*Magnolia grandiflora*	4	4	Poor	Fair	Medium	175	2.10	1.59	High Impact: >20%

The subject trees appear in poor health and appear to be suffering from transplant shock. The watering and maintenance regime post-transplant in 2017 (as per the carpark DA approval) is unknown. The soil immediately beneath the mulch layer was found to be very dry. There is substantial mounding of mulch around the base of the trees which is consistent with excessively deep mulching. The mulch is 250 mm deep in some parts whereas the maximum recommended mulch depth is 75 cm. Excessive mulching can cause additional stress by starving the roots of water, nutrients and oxygen. Fine roots were found in the upper mulch layer of all three subject trees.

The trees as they currently stand are incompatible with the proposed development. It has been proposed to transplant the trees again, to another location. Although the trees are still of a suitable size to transplant, their current poor health will make it unlikely that the transplants will be successful, and it is recommended that removing the subject trees and planting new advanced sized trees in the new location would be a more successful and cost-effective option.

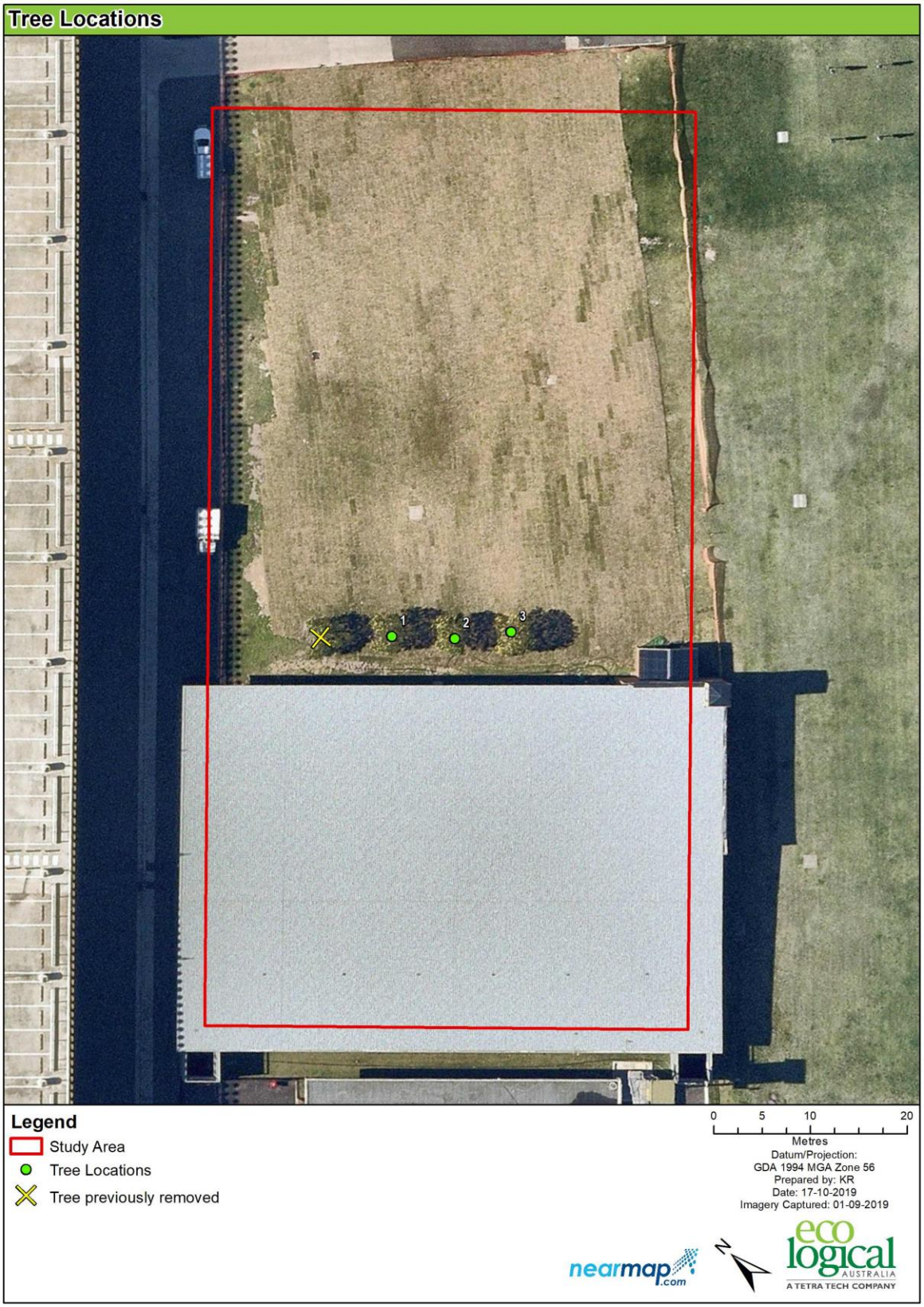

Figure 3: Tree locations within the subject site

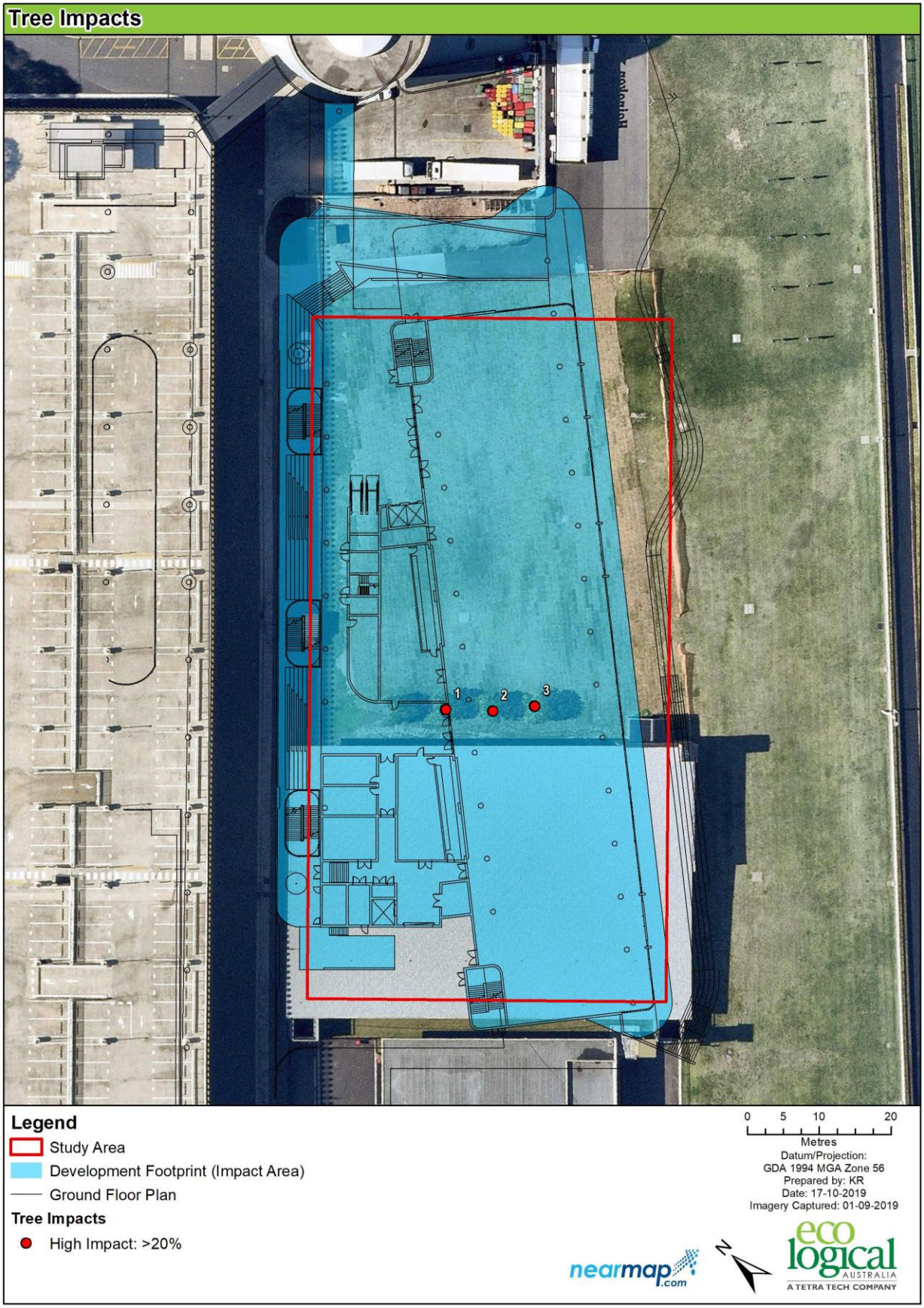

Figure 4: Results of arboricultural impact assessment

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Appendix A Tree retention assessment method

A1 Tree Significance Assessment Criteria - STARS©

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

Low	Medium	High
The tree is in fair-poor condition and good or low vigour.	The tree is in fair to good condition and good or low vigour	The tree is in good condition and good vigour
The tree has form atypical of the species	The tree has form typical or atypical of the species	The tree has a form typical for the species
The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings	The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area	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 provides a minor contribution or has a negative impact on the visual character and amenity of 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 is listed as a heritage item, threatened species or part of an endangered ecological community or listed on Council's significant tree register
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	The tree provides a fair contribution to the visual character and amenity of the local area	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'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's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ	The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.
The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms		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.
The tree has a wound or defect that has the potential to become structurally unsound.		
Environmental Pest / Noxious Weed 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.		

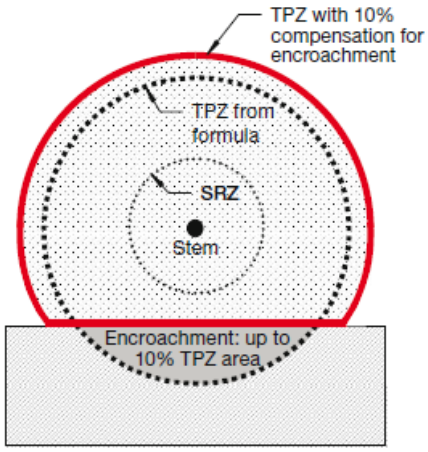
A2 Matrix assessment - STARS©

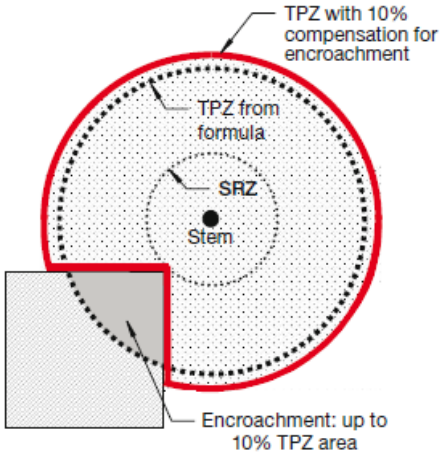
		Tree significance				
		High	Medium	Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest/Noxious Weed Species	Hazardous/ Irreversible Decline
Useful Life Expectancy	Long >40 years					
	Medium 15-40 years					
	Short <1-15 years					
	Dead					

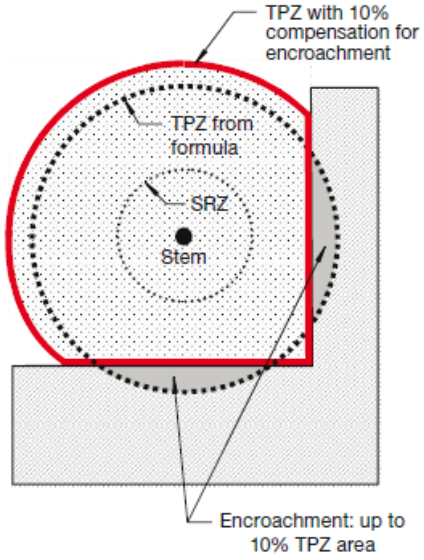
Legend:

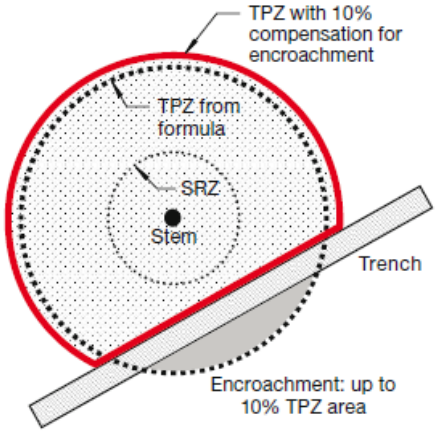
	Priority for retention (High): Tree considered important so should be retained and protected. Design modification or re-location of structure should be considered to accommodate the setbacks as prescribed by the *Australian Standard AS4970 Protection of trees on development sites*. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.
	Consider for retention (Medium): Tree considered less important, however**,** retention should remain priority. Removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for removal (Low): Tree not considered important for retention, nor requiring special works or design modification to be implemented for their retention.
	Priority for removal: Tree not considered important for retention, nor requiring special works or design modification to be implemented for their retention.

Appendix B Encroachment into tree protection zones - AS 4970-2009









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