ASPLUNDH

specialists in vegetation management

ARBORICULTURAL IMPACT ASSESSMENT

Yagoona Public School

Version 3

Prepared for:

Conrad Garett | Ancher Mortlock Woolley

18 October 2017

Phil Witten

Senior Consulting Arborist
Diploma of Arboriculture (AQF 5)
ISA | SRA-ANZ | AA | ESA | QTRA

P | 0425536670
E | phil@treesurvey.com.au

DISCLAIMER

All trees have been assessed based on the observations from the site inspection and information presented by the client or relevant parties at the time of inspection. No responsibility can be taken for incorrect or misleading information provided by the client or other parties.

Trees are living organisms. As such, their health and structure may alter, they will grow and their environmental circumstances may change from the time of the site inspection upon which this assessment is based. Trees, as with all living things, pose some level of risk.

Tree reports are valid for 12 months after the date of inspection, unless otherwise stated. Any significant change to the subject tree(s) or surrounding environment, including significant or catastrophic storm/wind events will require the immediate re-inspection and assessment of the tree(s).

Trees fail in ways that the arboricultural community are yet to fully understand. There is no guarantee expressed or implied that failure or deficiencies may not arise of the subject trees in the future. No responsibility is accepted for damage to property or injury/death caused by the nominated trees.

Contents

1 Background

1.1 Introduction

The NSW Department of Education proposes to upgrade Yagoona Public School to cater for future growth within the catchment area. The proposed capital works project focuses on the construction of 16 new permanent teaching spaces with associated toilets and administration area (the proposal).

Asplundh Tree Experts Pty Ltd was commissioned by Conrad Garett to prepare an arboricultural impact assessment for the proposed development. The purpose of this report is to:

- Identify the trees within the study area that are likely to be affected by the proposed works.
- Assess the current overall health and condition of the subject trees.
- Evaluate the significance of the subject trees and assess their suitability for retention.

1.2 The proposal

The key features of the proposal are summarised as follows:

- Replacement of classroom demountables with a new two storey classroom building.
- Returning the current staff and administration areas to learning areas.
- Providing a new staff and administration area as part of the new classroom building.
- Renewal of the area where the current demountables are, to reclaim green space.
- Existing car parking to be retained.

1.3 The subject trees

The subject trees were inspected on 24 August 2017. A total of **40** trees were assessed and included within this report. Further information, observations and measurements specific to each of the subject trees can be found in **Chapter 3**.

1.4 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*, the findings from the site inspections and analysis of the following documents/plans:

- *Conrad Garett: Landscape Plans, Rev C, August 2017.*
- *Craig & Rhodes: Detail Survey Plans, 14/7/17.*
- *Bankstown City Council: Development Control Plan (DCP) 2015.*

1.5 Council tree preservation

Tree **1** is listed as an exempt species, trees with a height of less than 5 metres are also exempt under the conditions prescribed within the *Bankstown City Council Development Control Plan (DCP) 2015.* All remaining subject trees are protected under the council tree preservation controls.

2 Method

2.1 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 and diameter at breast height (DBH) was estimated, unless otherwise stated.
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.

2.2 Tree retention assessment

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 Aboriculturalists (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.**

[1] VTA is an internationally recognised practice in the visual assessment of trees as formulated by Mattheck & Breloer (1994). Explanations and illustrations are contained within the publication, Field Guide for Visual Tree Assessment by Mattheck, C., and Breloer, H. Arboricultural Journa1, Vol 18 pp 1-23 (1994).

2.3 Impact assessment

- **Tree protection zone (TPZ):** The TPZ is the optimal combination of crown and root area (as defined by AS 4970-2009) that requires protection during the construction process so that the tree can remain viable. The TPZ is an area that is isolated from the work zone to ensure no disturbance or encroachment occurs into this zone. Tree sensitive construction measures must be implemented if work is to proceed within the Tree Protection Zone.
- **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. 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.
- **Root investigation:** 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 (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.

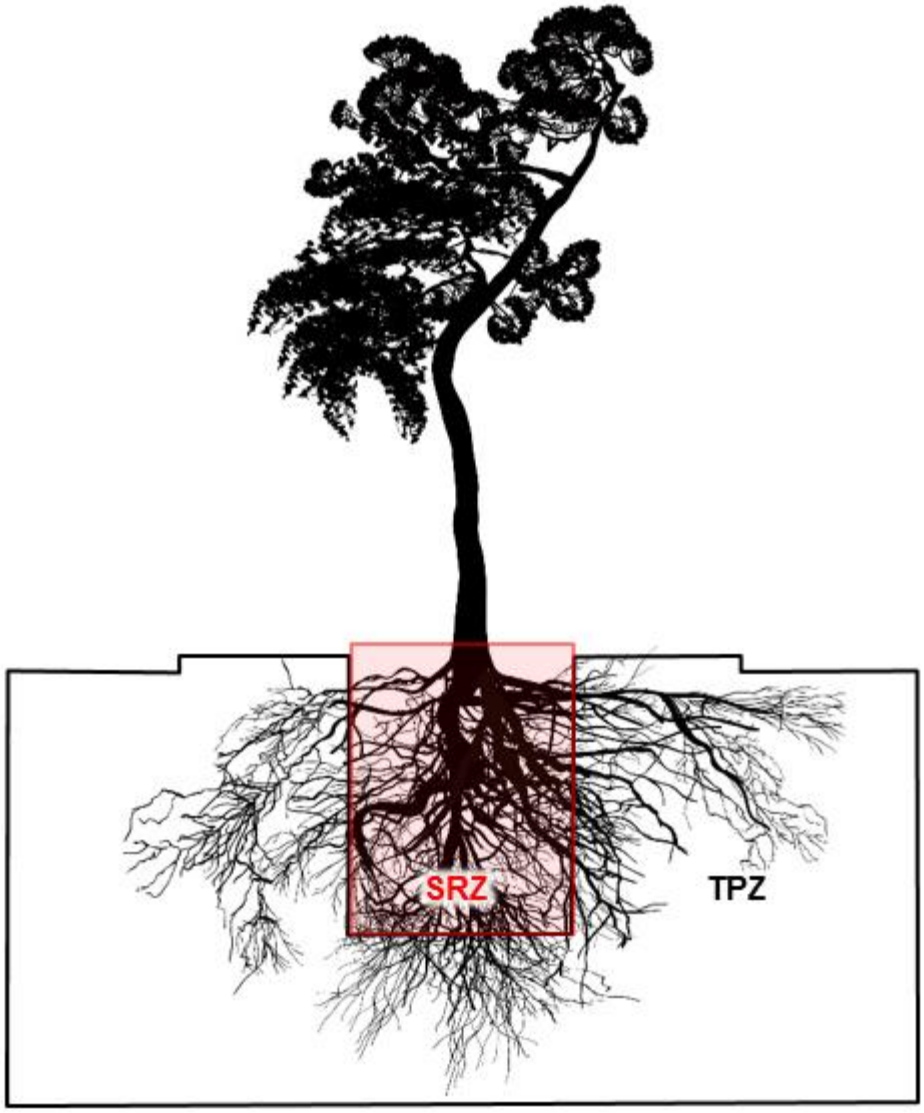


Figure 1: Indicative TPZ and SRZ

2.4 Impacts within the TPZ

- **No impact (0%):** No likely or foreseeable encroachment within the TPZ.
- **Low impact (<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.
- **Medium impact (<20%):** If the proposed encroachment is greater than 10% of the TPZ and outside of the SRZ, 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. All work within the TPZ must be carried out under the supervision of the project arborist.
- **High impact (>20%):** If the proposed encroachment is greater than 20% of the TPZ the SRZ may be impacted. 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 is essential for any proposed works within this area.

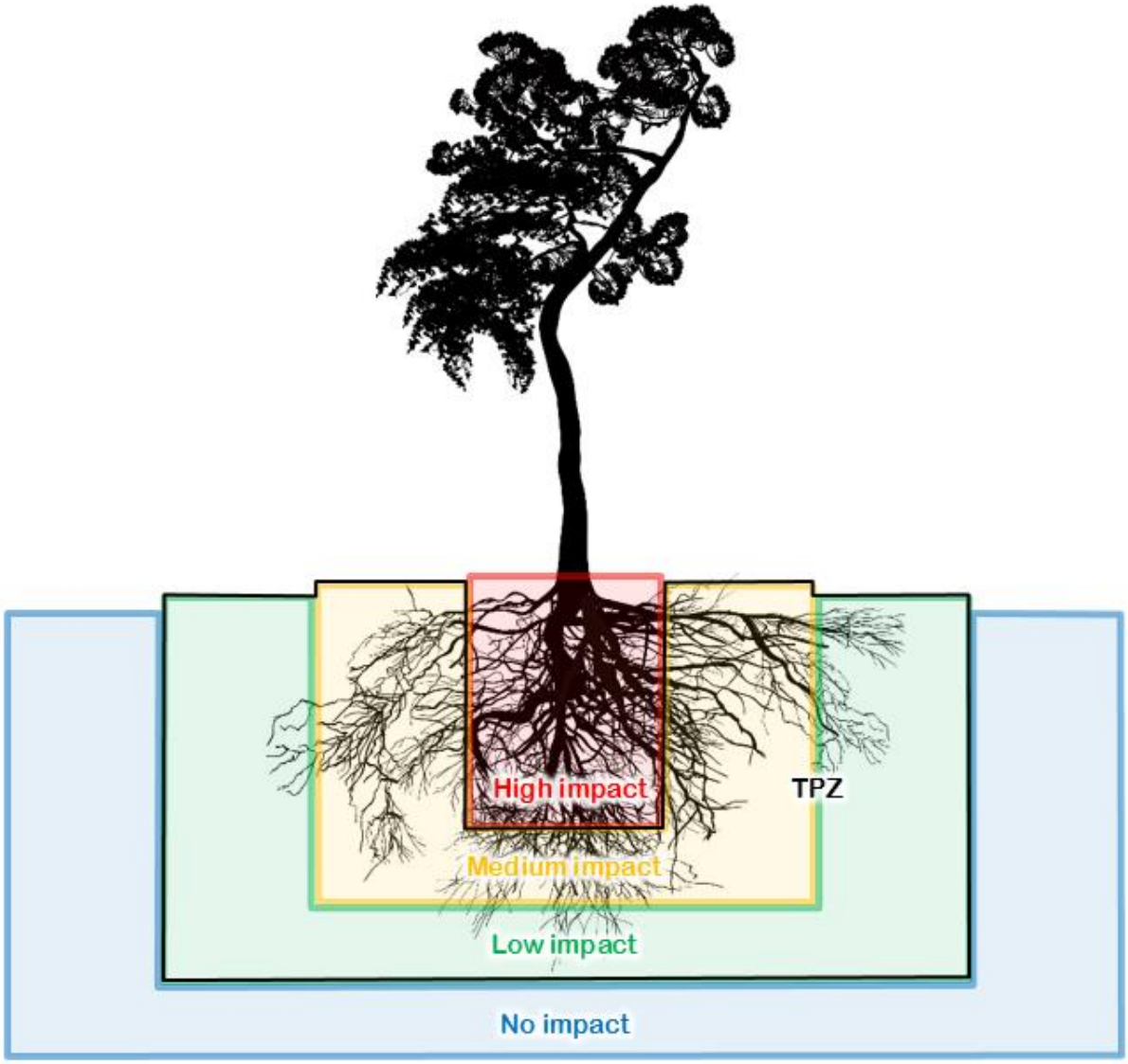


Figure 2: Indicative zones of impact within the TPZ

2.5 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.

Table 1: Mitigation measures

AS 4970-2009	Requirements under AS 4970-2009	Impact	Mitigation measures
No encroachment (0%)	• N/A	**No impact** (0%)	• N/A
Minor encroachment (<10%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • Detailed root investigations should not be required.	**Low impact** (<10%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • Tree protection must be installed.
Major encroachment (>10%)	• The project arborist must demonstrate the 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.	**Medium impact** (<20%)	• The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ. • The project arborist will be required to supervise any works within the TPZ. • Tree protection must be installed.
		High impact (>20%)	• The project arborist must demonstrate the tree(s) would remain viable. • Non-destructive root investigation will 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.

3 Results

Table 2 shows the results of the arboricultural assessment. Key points are:

- **Tree 14:** The overall structure of the tree is poor. A large open cavity and decay was observed within the base of the trunk and root crown.
- **No impact (0%): 24** trees are located outside the footprint of the proposed works. No impacts to the subject trees are foreseeable under the current proposal, these trees can be successfully retained.
- **Low impact (<10%): 2** trees will be subject to a minor encroachment (<10%). Minor encroachments are considered acceptable. Under the current proposal, these trees can be successfully retained.
- **High impact (>20%): 13** trees will be subject to a major encroachment (>20%). Under the current proposal, none of these subject trees will be retained.

Table 2: Results of the arboricultural assessment

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH (mm)	TPZ (m)	SRZ (m)	Impact	Other notes	Proposal
1	*Schefflera actinophylla*	6	6	Good	Fair	Mature	Low	Medium	Medium	500	6	2.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
2	*Melaleuca bracteata*	8	6	Good	Good	Mature	High	Long	High	500	6	2.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
3	*Archontophoenix alexandrae*	6	3	Good	Good	Mature	Low	Medium	Medium	250	3	1.9	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
4	*Callistemon viminalis*	4	3	Good	Fair	Semi-mature	Low	Medium	Medium	200	2.4	1.7	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
5	*Grevillea sp.*	4	4	Good	Fair	Semi-mature	Low	Medium	Medium	200	2.4	1.7	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
6	*Acacia parramattensis*	4	6	Good	Fair	Mature	Low	Medium	Medium	200	2.4	1.7	**High**	Subject tree is located within the proposed deck	Remove
7	*Eucalyptus microcorys*	16	18	Good	Good	Mature	High	Long	High	900	10.8	3.2	**Low**	Minor encroachment within the TPZ caused by construction of retaining wall and footings for deck	Retain
8	*Acacia parramattensis*	3	3	Good	Good	Juvenile	Low	Short	Low	150	2	1.5	**High**	Subject tree is located within the proposed deck	Remove
9	*Eucalyptus tereticornis*	14	4	Good	Good	Mature	High	Long	High	350	4.2	2.1	**High**	Major encroachment within the TPZ caused by construction of retaining wall and deck	Remove
10	*Eucalyptus crebra*	3	1	Good	Good	Juvenile	Low	Medium	Medium	100	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
11	*Eucalyptus sp.*	7	5	Good	Good	Mature	Low	Medium	Medium	300	3.6	2	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
12	*Eucalyptus robusta*	4	2	Good	Good	Juvenile	Medium	Long	High	150	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
13	*Eucalyptus crebra*	3	1	Good	Good	Juvenile	Low	Medium	Medium	100	2	1.5	**High**	Subject tree is located within the construction footprint	Remove
14	*Corymbia citriodora*	10	10	Good	Poor	Mature	Medium	Long	High	800	9.6	3	**-**	This tree is defective and poses an unacceptable risk, please refer to **Section 4**	Remove
15	*Eucalyptus robusta*	5	3	Good	Good	Juvenile	Medium	Long	High	150	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
16	*Eucalyptus crebra*	4	2	Good	Good	Juvenile	Medium	Long	High	150	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
17	*Corymbia citriodora*	12	7	Good	Good	Mature	High	Long	High	350	4.2	2.1	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
18	*Eucalyptus sp.*	12	7	Good	Good	Mature	High	Long	High	450	5.4	2.4	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
20	*Corymbia maculata*	6	2	Good	Fair	Mature	Medium	Long	High	250	3	1.9	**Low**	Minor encroachment within the TPZ caused by excavations and the construction footprint	Retain
21	*Acacia parramattensis*	8	5	Poor	Poor	Over-mature	Low	Short	Low	250	3	1.9	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
22	*Eucalyptus moluccana*	14	5	Good	Good	Mature	High	Long	High	350	4.2	2.1	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove

Id.	Botanical name	Height (m)	Spread (m)	Health	Structure	Age class	Tree significance	Useful life expectancy	Priority for retention	DBH (mm)	TPZ (m)	SRZ (m)	Impact	Other notes	Proposal
23	*Eucalyptus tereticornis*	12	3	Good	Fair	Mature	Medium	Long	High	250	3	1.9	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
24	*Acacia parramattensis*	4	5	Poor	Poor	Over-mature	Low	Short	Low	150	2	1.5	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
25	*Eucalyptus robusta*	9	12	Good	Fair	Mature	High	Long	High	400	4.8	2.3	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
26	*Acacia sp.*	5	5	Good	Fair	Semi-mature	Low	Medium	Medium	200	2.4	1.7	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
27	*Corymbia maculata*	16	7	Good	Good	Mature	High	Long	High	300	3.6	2	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
28	*Casuarina glauca*	7	4	Good	Fair	Mature	Medium	Long	High	250	3	1.9	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
29	*Eucalyptus robusta*	10	10	Good	Good	Mature	High	Long	High	500	6	2.5	**High**	Major encroachment within the TPZ caused by excavations and the construction footprint	Remove
30	*Eucalyptus robusta*	8	8	Poor	Fair	Mature	Medium	Long	High	400	4.8	2.3	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
31	*Melaleuca styphelioides*	4	3	Good	Good	Juvenile	Medium	Long	High	150	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
32	*Acacia sp.*	5	4	Poor	Poor	Over-mature	Low	Short	Low	200	2.4	1.7	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
33	*Corymbia maculata*	12	5	Good	Good	Mature	High	Long	High	300	3.6	2	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
34	*Acacia sp.*	6	4	Dead	Poor	Juvenile	Low	Short	Low	150	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
35	*Eucalyptus tereticornis*	12	8	Good	Good	Mature	High	Long	High	350	4.2	2.1	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
36	*Eucalyptus moluccana*	6	3	Fair	Fair	Juvenile	Low	Medium	Medium	100	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
37	*Eucalyptus tereticornis*	9	5	Good	Good	Mature	High	Long	High	350	4.2	2.1	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
38	*Acacia parramattensis*	4	4	Poor	Poor	Juvenile	Low	Short	Low	150	2	1.5	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
39	*Eucalyptus robusta*	7	6	Fair	Good	Mature	High	Long	High	300	3.6	2	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
42	*Corymbia citriodora*	16	12	Good	Good	Mature	High	Long	High	600	7.2	2.7	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain
43	*Jacaranda mimosifolia*	6	4	Good	Good	Mature	Medium	Medium	High	250	3	1.9	**None**	No impacts to the subject tree are foreseeable under the current proposal	Retain

4 Recommendations

4.1 Trees proposed for retention

No impact (0%): **24** trees were identified outside the footprint of the proposed works.

- Tree protection must be installed in accordance with **Chapter 5.1.**

Low impact (<10%): **2** trees will be subject to a minor encroachment (<10%). The following mitigation measures will be required for any works undertaken within the TPZ:

- Tree protection must be installed in accordance with **Chapter 5.1.**
- The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ (see **Appendix IV**).
- Structural soil (with a particle size larger than that of the existing soil) should be used for any fill required in the TPZ.

All underground services proposed within the TPZ must be installed using tree sensitive methods such as; horizontal directional drilling, boring, non-destructive excavation.

4.2 Trees proposed for removal

Tree 14: The overall structure of the tree is poor. A large open cavity and decay was observed within the base of the trunk and root crown. This tree poses an unacceptable risk and is recommended for removal.

High impact (>20%): **13** trees will be subject to a major encroachment (>20%). These trees cannot be retained under the current proposal.

4.3 Offsetting

Any loss of trees should be offset with replacement planting at a ratio of 3:1, or in accordance with the relevant offset policy. Planting locations should not be restricted to within the development area, and may include alternative suitable locations within the school grounds. Replacement species should be selected with consideration to the following species:

- *Acmena smithii* (Lilly Pilly)
- *Angophora floribunda* (Rough barked Apple)
- *Brachychiton acerifolius* (Illawarra Flame Tree)
- *Eleocarpus eumundi* (Eumundi Quandong)
- *Eleocarpus reticulatus* (Blueberry Ash)
- *Eucalyptus sideroxylon* (Mugga Ironbark)
- *Melaleuca decora* (White Cloud Tree)
- *Stenocarpus sinuatus* (Firewheel Tree)

4.4 Tree work

All tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with *Australian Standard AS 4373-2007, Pruning of Amenity Trees* and the *NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).*

5 Tree management plan

5.1 Tree protection

The following tree protection measures will be required for all trees proposed for retention (**Chapter 4**):

- Tree protection fencing must be established around the perimeter of the TPZ. If the protective fencing requires temporary removal, trunk, branch and ground protection must be installed and must comply with *AS 4970-2009 - Protection of trees on development sites*. Existing fencing and site hoarding may be used as tree protection fencing, providing the TPZ remains isolated from construction activities.
- If temporary access for machinery is required within the TPZ, ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Ground protection may include a permeable membrane such as geotextile fabric beneath a layer of mulch, crushed rock or rumble boards.
- Any additional construction activities within the TPZ of the subject trees must be assessed and approved by the project arborist, and must comply with *AS 4970-2009 - Protection of trees on development sites.*

Further information and guidelines on tree protection is in **Appendix III**.

5.2 Hold points, inspection and certification

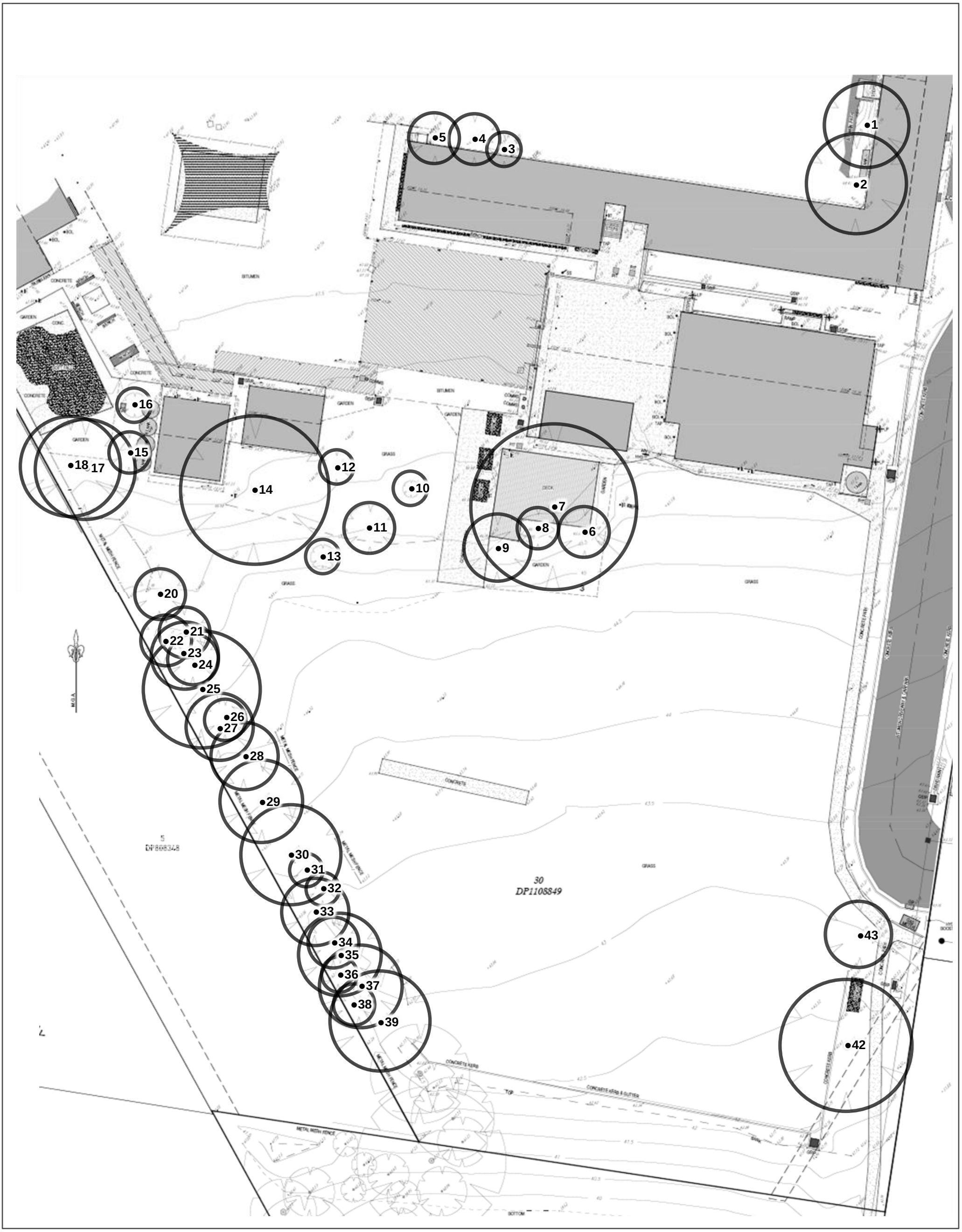
The approved tree protection plan must be available onsite prior to the commencement of works, and throughout the entirety of the project. To ensure the tree protection plan is implemented, hold points have been specified in the schedule of works (**Table 3**). It is the responsibility of the principal contractor 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.

Table 3: Schedule of works

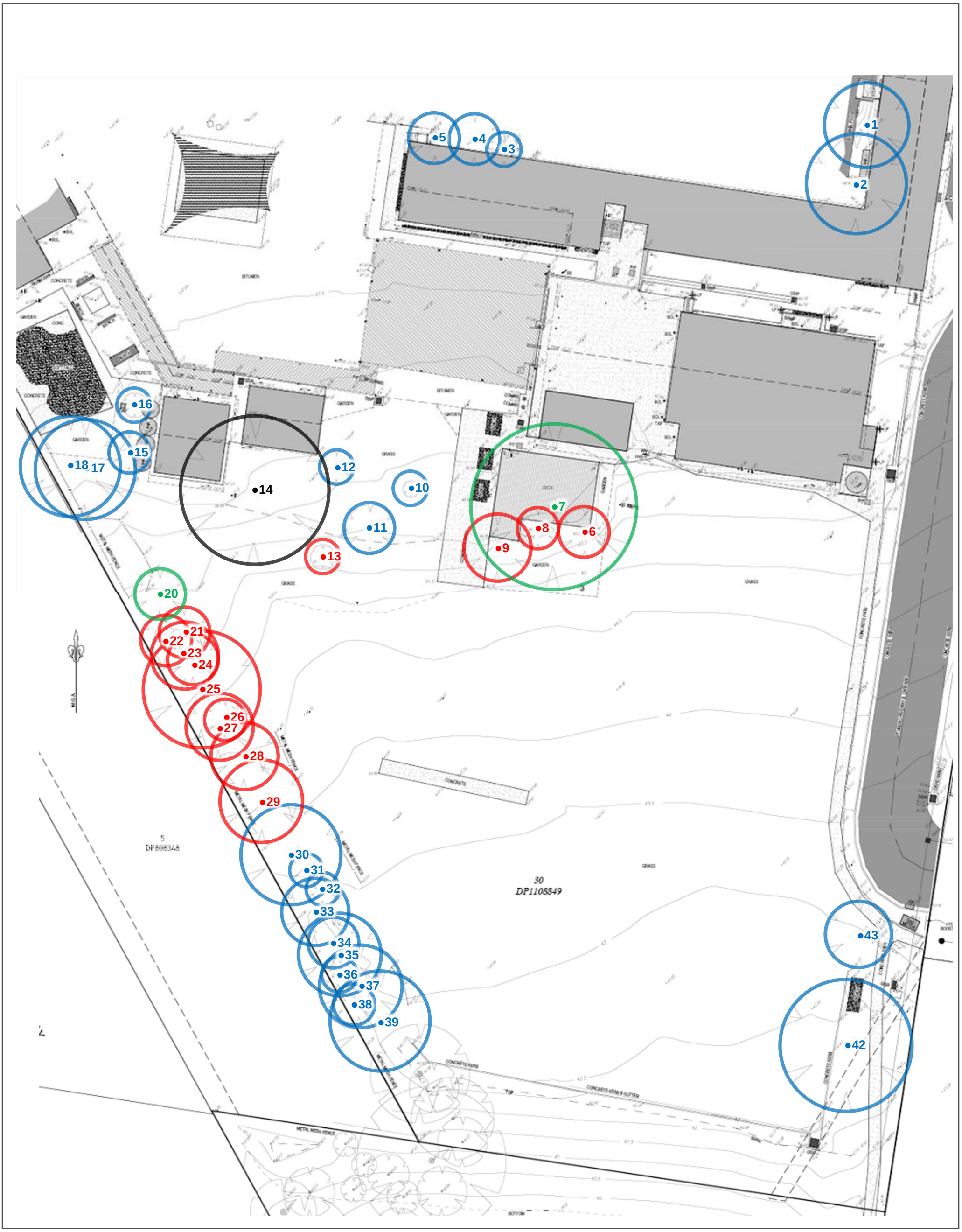
Pre-construction	Prior to demolition and site establishment indicate clearly (with spray paint on trunks) trees marked for removal only.
	Tree protection (for trees that will be retained) shall be installed prior to demolition and site establishment, this will include mulching of areas within the TPZ
During Construction	Scheduled inspection of trees by the project arborist should be undertaken monthly during the construction period.
	Inspection of trees by project arborist after all major construction has ceased, following the removal of tree protection measures.
Post Construction	Final inspection of trees by project arborist.

Appendix I - Tree locations



Appendix I: The subject trees

Appendix II - Impact assessment



Appendix II: No impact, low impact, medium impact, high impact

Appendix III - Tree protection guidelines

Tree protection fencing

The TPZ is a restricted area delineated by protective fencing or the use of an existing structure (such as a wall or fence).

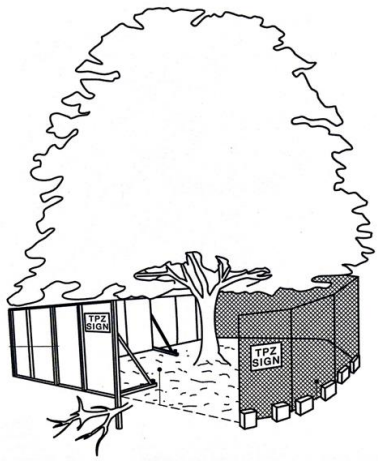
Trees that are to be retained must have protective fencing erected around the TPZ (or as specified in the body of the report) to protect and isolate it from the construction works. Fencing must comply with the *Australian Standard, AS 4687-2007, Temporary fencing and hoardings*.

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.

If the protective fencing requires temporary removal, trunk, branch and ground protection must be installed and must comply with *AS 4970-2009, Protection of Trees on Development Sites*.

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”.



Crown protection

Tree crowns/canopy may be injured or damaged by machinery such as; excavators, drilling rigs, trucks, cranes, plant and vehicles. Where crown protection is required, it will usually be located at least one meter outside the perimeter of the crown.

Crown protection may include the installation of a physical barrier, pruning selected branches to establish clearance, or the tying/bracing of branches.

Trunk protection

Where provision of tree protection fencing is impractical or must be temporarily removed, truck protection shall be installed for the nominated trees to avoid accidental mechanical damage.

The removal of bark or branches allows the potential ingress of micro-organisms which may cause decay. Furthermore, the removal of bark restricts the trees’ ability to distribute water, mineral ions (solutes), and glucose.

Trunk protection shall consist of a layer of either carpet underfelt, geotextile fabric or similar wrapped around the trunk, followed by 1.8 m lengths of softwood timbers aligned vertically and spaced evenly around the trunk (with an approx. 50 mm gap between the timbers).

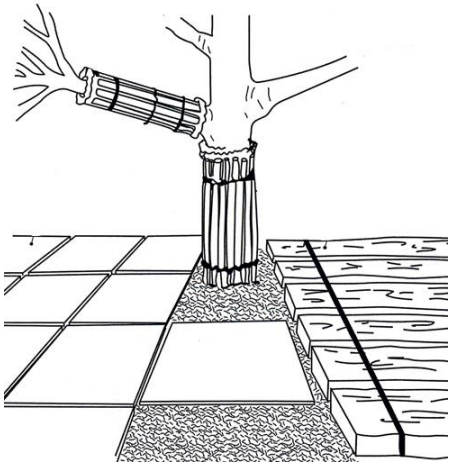
The timbers must be secured using galvanised hoop strap (aluminium strapping). The timbers shall be wrapped around the trunk but not fixed to the tree, as this will cause injury/damage to the tree.

Ground protection

Tree roots are essential for the uptake/absorption of water, oxygen and mineral ions (solutes). It is essential to prevent the disturbance of the soil beneath the dripline and within the TPZ of trees that are to be retained. Soil compaction within the TPZ will adversely affect the ability of roots to function correctly.

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Ground protection may include a permeable membrane such as geotextile fabric beneath a layer of mulch, crushed rock or rumble boards.

If the grade is to be raised within the TPZ, the material should be coarser or more porous than the underlying material.



Root protection & pruning

If incursions/excavation within the TPZ are unavoidable, exploratory excavation (under the supervision of the Project Arborist) using non-destructive methods may be considered to evaluate the extent of the root system affected, and determine if the tree can remain viable.

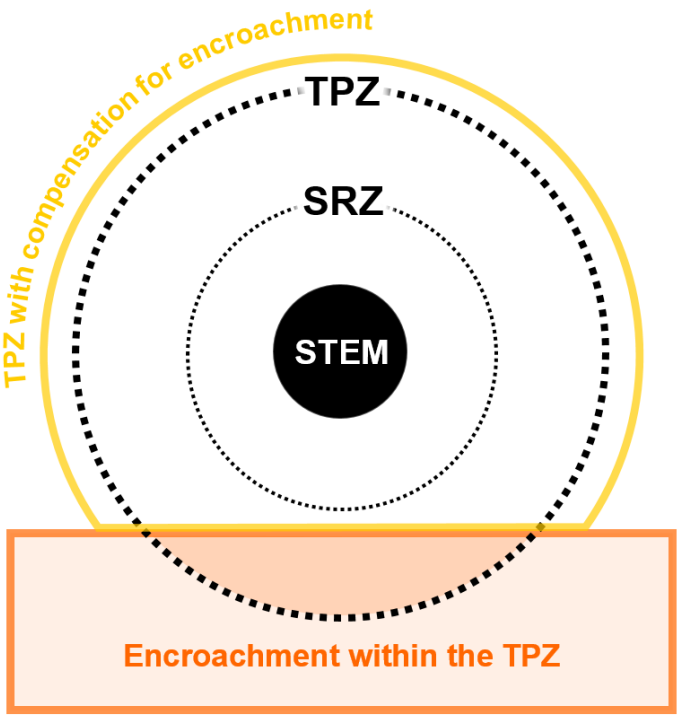
If the project arborist identifies conflicting roots that requiring pruning, they must be pruned with a sharp implement such as; secateurs, pruners, handsaws or a chainsaw back to undamaged tissue. The final cut must be a clean cut.

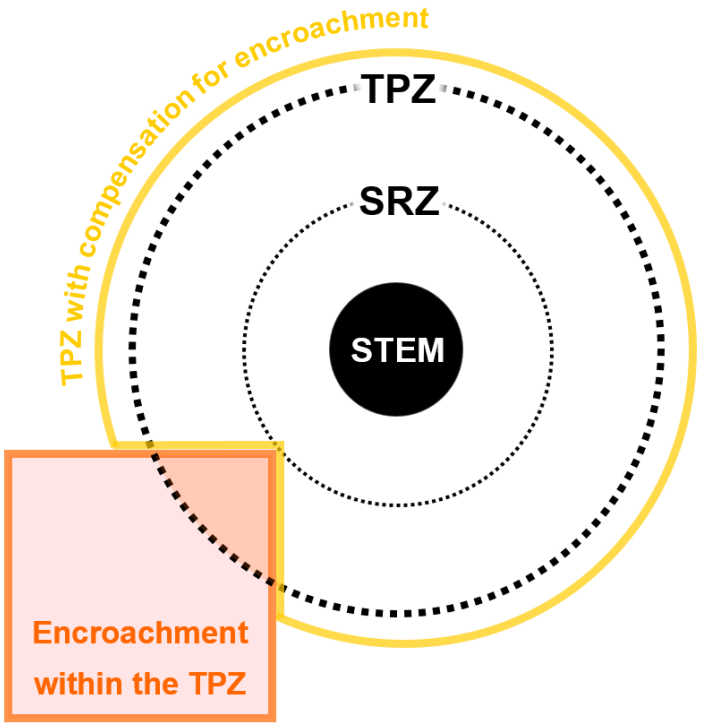
Underground services

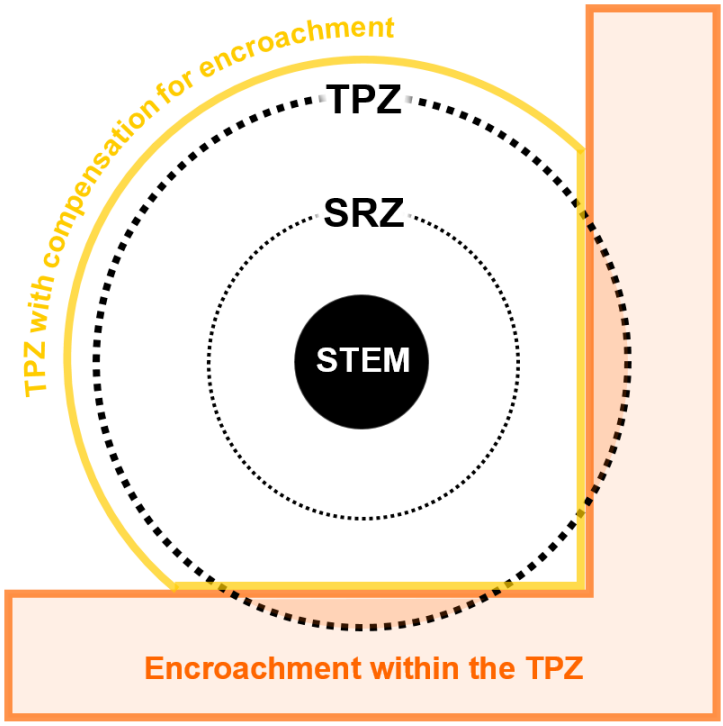
All underground services should be routed outside of the TPZ. If underground services need to be installed within the TPZ, they should be installed using horizontal directional drilling (HDD). The horizontal drilling/boring must be at minimum depth of 600mm below grade. Trenching for services is to be regarded as “excavation”

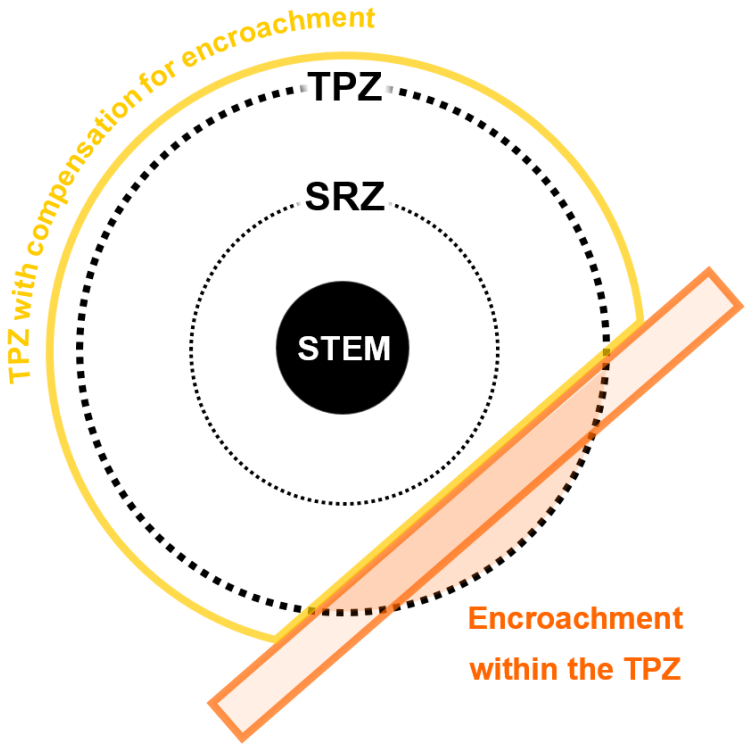
Appendix IV - Encroachment within the TPZ

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









Reference

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

Appendix V - STARS© assessment matrix

Tree Significance - Assessment Criteria		
Low	**Medium**	**High**
The tree is in fair-poor condition and good or low vigour. The tree has form atypical of the species The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms The tree has a wound or defect that has the potential to become structurally unsound. The tree is an environmental pest species due to its invasiveness or poisonous/allergenic properties. The tree is a declared noxious weed by legislation	The tree is in fair to good condition The tree has form typical or atypical of the species The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street The tree provides a fair contribution to the visual character and amenity of the local area The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ	The tree is in good condition and good vigour The tree has a form typical for the species The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age. The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on councils significant tree register The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity. The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values. The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions.

Useful Life Expectancy - Assessment Criteria			
Dead	**Short**	**Medium**	**Long**
Trees with a high level of risk that would need removing within the next 5 years. Dead trees. Trees that should be removed within the next 5 years. Dying or suppressed or declining trees through disease or inhospitable conditions. Dangerous trees through instability or recent loss of adjacent trees. 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.	Trees that appear to be retainable with an acceptable level of risk for 5-15 years. Trees that may only live between 5 and 15 more 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 15 years but would be removed during the course of normal management for safety or nuisance reasons. Storm damaged or defective trees that require substantial remedial work to make safe, and are only suitable for retention in the short term.	Trees that appear to be retainable with an acceptable level of risk for 15-40 years. Trees that may only live between 15 and 40 more years. Trees that may live for more than 40 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 during the course of normal management for safety or nuisance reasons. Storm damaged or defective trees that require substantial remedial work to make safe, and are only suitable for retention in the short term.	Trees that appear to be retainable with an acceptable level of risk for more than 40 years. Structurally sound trees located in positions that can accommodate future growth. Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery. Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

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.