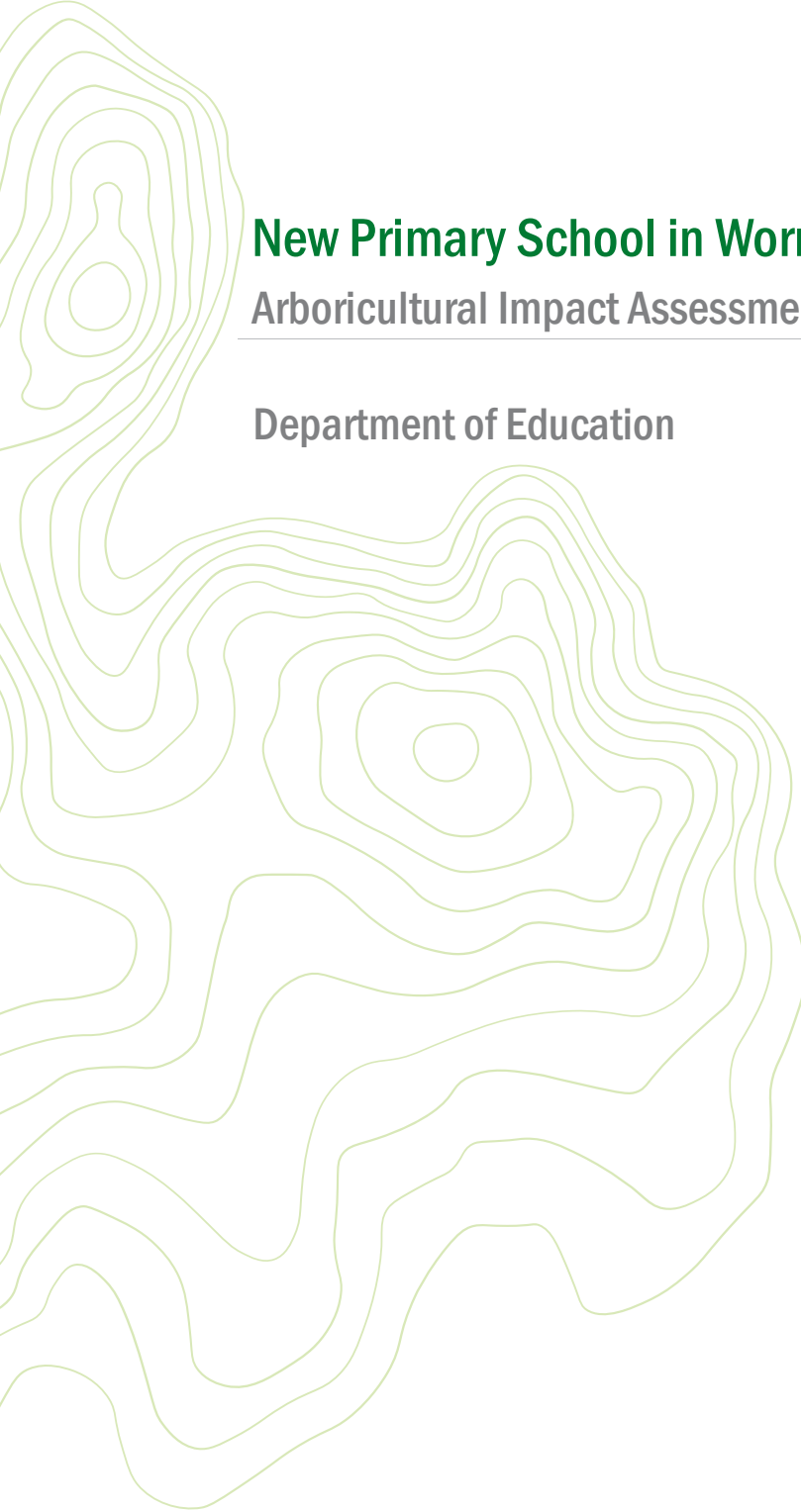




New Primary School in Worrige

Arboricultural Impact Assessment

Department of Education

Document Tracking

Project Name:	New Primary School in Worrigee - Arboricultural Impact Assessment
Project Number:	24SYD9562
Project Manager:	Belinda Failes
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Version	Prepared by	Reviewed by	Approved by	Status	Date
3	Erin Hodgkin / Daniel McDonald (AQF Level 5 Arborist)	Daniel McDonald / Deanne Hickey	David Bonjer	Final	23/03/2026

This report should be cited as 'Eco Logical Australia 2026, New Primary School in Worrigee - Arboricultural Impact Assessment. Prepared for the Department of Education.'

Acknowledgements

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Abbreviations

Abbreviation	Description
AIA	Arboricultural Impact Assessment
AQF	Australian Qualifications Framework
AS	Australian Standards
DAB	Diameter at Base
DCP	Development Control Plan
DoE	Department of Education
DSH	Diameter at Standard Height
ELA	Eco Logical Australia
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
GIS	Geographical Information System
HDD	Horizontal Directional Drilling
IACA	Institute of Australian Consulting Arborists
m	Metre
mm	Millimetre
NDE	Non-Destructive Excavation
NRZ	Notional Root Zone
NSW	New South Wales
REF	Review of Environmental Factors
SINSW	School Infrastructure New South Wales
SP/SPP	Species
SRZ	Structural Root Zone
STARS	Significance of a Tree Assessment Rating System
SULE	Safe Useful Life Expectancy
TPP	Tree Protection Plan
TPZ	Tree Protection Zone
VTA	Visual Tree Assessment

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1. Introduction

This Arboricultural Impact Assessment (AIA) report has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (the department) for the construction and operation of a New Primary School in Worrigee (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (TI SEPP).

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (DPHI, December 2025) (the Guidelines). This report examines and takes into account the relevant environmental factors in the Guidelines and Section 170 and Section 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) as outlined in Table 1.

Table 1: Summary of Relevant Sections of the Guidelines and EP&A Regulation

Environmental factor	Division Factors for school developments	Response	Report Section
(c) the environmental impact on the ecosystems of the locality	(c2) long- and short-term impact of: (i) loss or harm to trees or other vegetation (ii) removed canopy cover (iii) landscape setting in respect of the site and streetscape	This report presents trees considered retention-incompatible with the current design. For environmental impacts of tree removal, refer to the Flora and Fauna Assessment (ELA, 2026)	All sections

Furthermore, this report has been prepared to:

- undertake a visual tree assessment of the subject trees to:
 - assess the current overall health and condition of the subject trees
 - evaluate the retention value of the subject trees;
- determine the likely impacts on subject trees and identify trees to be removed, retained, or transplanted, based on outcomes of the impact assessment; and
- recommend tree protection measures to minimise adverse impacts.

1.1. Activity description

The activity is for the construction and operation of a New Primary School in Worrigee under Chapter 2 and Chapter 3 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021*, comprising:

- permanent classroom buildings including a support learning unit
- hall
- canteen
- covered outdoor learning area
- library
- administration
- sports field

- waste storage facility
- landscaping
- car parking
- public domain works
- infrastructure upgrades
- a capacity of 582 students

The proposed activity does not include the new public preschool or roundabout. The new public preschool is subject to a separate planning pathway and environmental assessment. The roundabout is to be delivered by Council. Figure 1 shows an indicative site plan and distinguishes the indicative extent of the proposed activity in relation to the new public preschool and roundabout.

1.2. Activity site

The site is known as 9 Worrigee Road, Worrigee. The site has a frontage of 125.23m to Greenwell Point Road, 149.87m to Worrigee Road and 114.89m to Booligal Road (including the preschool frontage). The site is legally described as Lot 1 in Deposited Plan 576975 and is 2 hectares (by title). Offsite works are also proposed in the adjacent road reserves. Figure 2 provides an aerial photograph of the site.

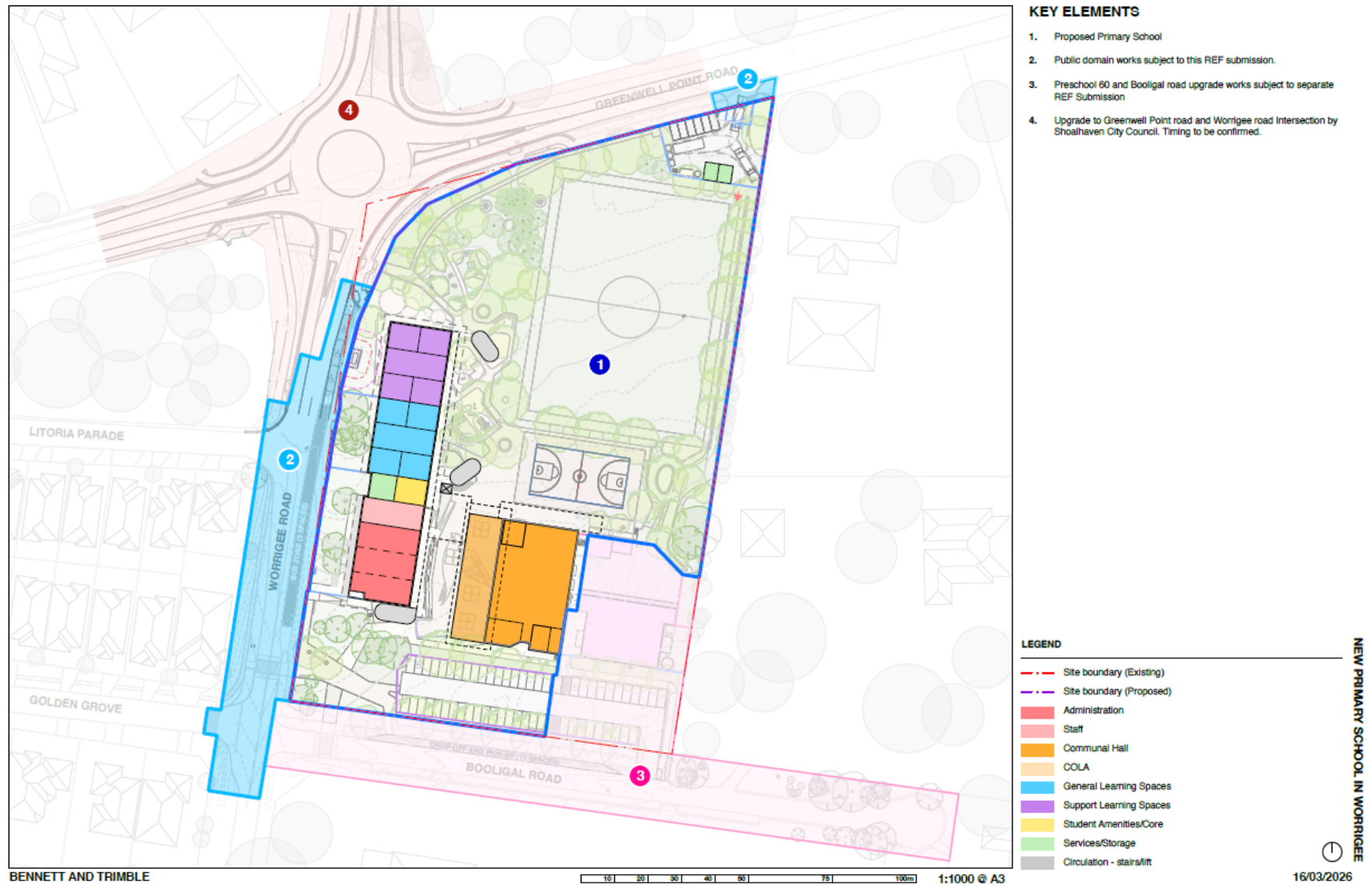


Figure 1: Indicative Site Plan (Bennett and Trimble, 2026)



Figure 2: Location

2. Methodology

2.1. Definition of a tree

A tree is defined under the Australian Standard, AS 4970-2025, *Protection of Trees on Development Sites* (AS 4970 – 2025) 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.

In accordance with the Shoalhaven Development Control Plan (DCP) 2014 (Shoalhaven City Council 2014), the LGA defines a declared tree as:

- i. less than 50 metres from the bank of a creek or water body deemed Category 1 (large creek/river) as defined by the SLEP 2014; or*
- ii. less than 30 metres from the bank of a creek or water body deemed Category 2 as defined by the SLEP 2014; or*
- iii. verified as supporting an endangered ecological community (EEC); or*
- iv. mapped as supporting rainforest vegetation species; or v. mapped on the Scenic Protection Area Map of SLEP 2014; or*
- vi. within 30 metres from a non-urban road boundary.'*

For the purposes of this assessment, trees located within the site that meet the above definitions, are considered subject trees.

2.2. Visual tree assessment

The health and condition of 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 157 trees were assessed within the broader subject lot on 08 April 2025 by AQF Level 5 Consulting Arborist David Bidwell. Of the 157 trees, a total of 117 are located in or within 15 m of, the New Primary School in Worrigee (the site). This report does not consider trees listed as retention-incompatible under the separate Worrigee New Public Preschool AIA (ELA, 2026a). Similarly, while the figures in this report show Tree 137, this tree is not included in this assessment as it is captured under the Worrigee New Public Preschool REF. This tree requires root investigation prior to the preschool works to determine retention viability. Should this tree be deemed feasible for retention by the project arborist, this tree will require protection throughout the public school works and therefore has been shown on the figures in this report for context.

The following limitations apply to this methodology:

- Tree height was estimated using a laser clinometer or by visually estimation when site lines for the clinometer were not suitable.
- Diameter at standard height (DSH) and diameter at base (DAB) was measured using DSH tape, where accessible.
- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and specialist testing.
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.

- Tree canopy spread was measured by stepping out the distance within the dripline or visually estimated.
- The locations of the subject trees were recorded by ELA in the field using hand-held GPS units and were matched, where possible, to the survey titled *3050-01687-200-001_02.dwg* [drawing] (Stantec 2025). Trees not recorded in the survey were located using NearMap imagery and field photographs.
- The impact assessment considered the stormwater, earthwork and landscape drawings prepared by, titled “X-11067-DESIGN WORRIGEE PS-MS-Isopach_100mm Indesco (2026) and “JMD_LANDSCAPE BASE_Worrigee Concept-tree coordination” (JMD Design, 2026). While the utilities service drawings were reviewed (Lucid, 2026), it is understood these plans are not final, and therefore mitigation measures regarding the placement of these services are outlined in Section 4.4 of this report.
- No aerial inspections or root mapping investigations were undertaken.

2.3. Retention value & landscape significance

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 Safe Useful Life Expectancy (SULE) and landscape significance of a tree. Trees were provided one of the following ratings:

- **High:** 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 4970–2025 Protection of trees on development sites*.
- **Medium:** 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:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- **Priority for removal:** These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

2.4. Protection zones

2.4.1. Notional Root Zone (NRZ)

The Notional Root Zone (NRZ) is a specific radius area above and below ground and at a distance from the centre of the trunk, used to define an indicative area for the distribution of tree’s roots and is a primary trigger for arboricultural input on a development site (Figure 3). The NRZ is determined by the following formula:

DSH x 12, where DSH is measured 1.4 m above ground.

The NRZ of palms, other monocots and tree ferns is not calculated but should not be less than 2 m. Any NRZ radius shall not be less than 2 metres, nor greater than 15 m, and the determined NRZ shall be used as the starting point for determining the Tree Protection Zone (TPZ) required for development.

2.4.2. Structural Root Zone (SRZ)

The Structural Root Zone (SRZ) is a notional area of the root system (as defined by AS 4970 - 2025) required for stability, mechanical support, and anchorage of the tree. It is critical for the support and stability of trees (Figure 3). Severance of roots within the SRZ is not recommended as it may lead to the destabilisation and/or decline of the tree.

Many factors affect the size of the true SRZ (e.g. tree height, crown area, soil type and moisture, as well as built structures such as rocks and footings). A notional SRZ radius may be determined from the trunk diameter measured immediately above the root buttress (Diameter at Base (DAB)), using the formula:

$$(DAB \times 50)^{0.42} \times 0.64$$

The SRZ calculation does not apply to palms, cycads, tree ferns and other monocot tree-like plants.

2.4.3. Tree Protection Zone (TPZ)

Establishment and maintenance of a Tree Protection Zone (TPZ) is crucial for protecting trees during development and is determined by the Project Arborist, in accordance with AS4970-2025 (Appendix C). The TPZ is a restricted zone usually delineated by protective fences, existing structure such as a fence or a wall, or other physical protection methods, and where a NRZ is encroached, the TPZ should include compensatory areas.

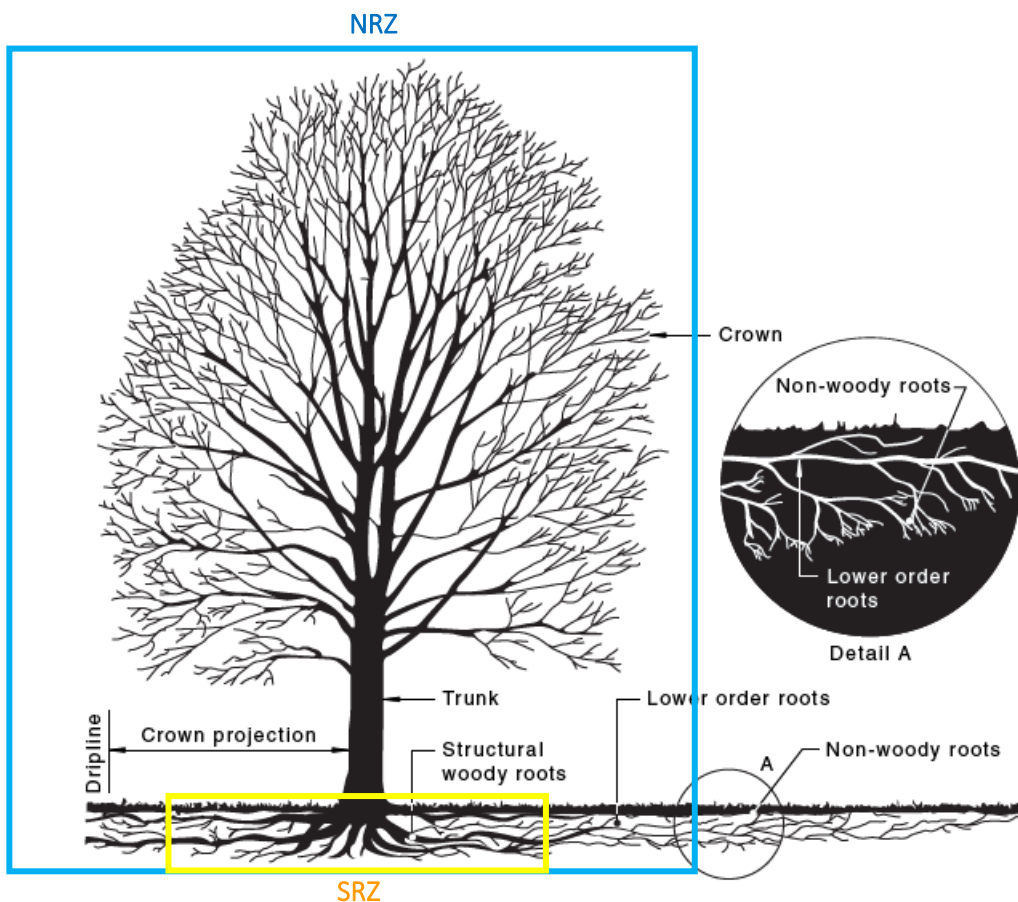


Figure 3: Representative tree structure and indicative NRZ and SRZ

2.5. Potential impacts

Trees may be impacted by physical or chemical damage to roots or above tree parts. Examples include impacts associated with demolition, bulk earthworks, soil compaction, excavation, stock piling within the NRZ, as well as changes in site hydrology, removal of surrounding trees, changes in soil level and site contamination.

Cut or fill within or near a NRZ can significantly affect tree health and stability due to the disruption of the root system. The root system is critical for water and nutrient uptake, anchorage, and overall tree vitality (AS4970-2025). Cut, or excavation, even at minor levels may sever lateral roots, especially those within the top 600 mm of soil, where most roots are concentrated (Matheny & Clark, 1998). Further, exposed root zones may dry out and or collapse, further damaging roots and / or structural integrity. Fill, or battering, may suffocate roots by reducing oxygen diffusion into the soil. AS4970-2025 outlines how even small amounts of fill can alter soil aeration and moisture regimes. In addition, fill may cause soil compaction and alter pH.

The extent of encroachment to the NRZ and SRZ determines the level of potential impact and feeds into determination of the required TPZ for trees to be retained (Appendix C). AS 4970 – 2025 defines encroachment as minor, moderate, or major based on the percentage of NRZ encroachment, or presence/absence of SRZ encroachment, as well as consideration of the potential for mitigation measures and/or further investigations to support viable retention. Definitions for each category are outlined below.

2.5.1.1. *Minor NRZ encroachment*

The proposed encroachment is considered minor if it is less than or equal to 10% of the NRZ, has not experienced recent NRZ encroachments, and is located outside of the SRZ. It is unlikely that there will be a significant impact to tree health, longevity or structure. Tree protection should be implemented during site works, and to avoid a net loss of soil area and volume, a compensatory area equivalent to the encroachment shall be incorporated into the TPZ; unless the Project Arborist otherwise demonstrates that the tree will remain viable.

2.5.1.2. *Moderate NRZ encroachment*

The proposed encroachment is considered moderate if it is greater than 10% and less than or equal to 20% of the area of the NRZ and is located outside of the SRZ. A Project Arborist shall be engaged to review the proposed impacts and undertake any necessary investigations to determine the viability for retention. This may be through the implementation of suitable design measures and construction controls to mitigate impacts during development and would be outlined in the Tree Protection Specification (TPS) and Tree Protection Plan (TPP) within the AIA.

To avoid a net loss of soil area and volume, a compensatory area equivalent to the encroachment shall be incorporated into the TPZ; unless the Project Arborist otherwise demonstrates that the tree will remain viable.

2.5.1.3. *Major NRZ encroachment*

The proposed encroachment is considered major if it is greater than 20% of the NRZ or located inside the SRZ. The Project Arborist shall be engaged to explore alternative designs with the planning team and/or demonstrate that the tree will remain viable.

Demonstrating viability of these trees will require detailed investigations, such as root investigation, soil analysis, historical records, relevant literature and examples of similar encroachments. If viable for

retention, supportive design measures and construction controls shall be outlined in the TPS and TPP to demonstrate viability for retention. To avoid a net loss of soil area and volume, a compensatory area equivalent to the encroachment shall be incorporated into the TPZ.

2.5.2. Tree outcomes

Based on GIS analysis and investigation by the Project Arborist, retention of trees is considered either compatible, compatible subject to the implementation of mitigation measures, or incompatible, with the proposed design.

The definitions of these outcomes are outlined below:

- **Retention-incompatible:** Trees that are subject to major or moderate encroachment from the proposed development to the extent whereby tree retention is incompatible under the current design if the current plans are approved. Dead trees may also be recommended for removal by the arborist, regardless of the extent of impact. All tree removal must comply with guidelines specified in Section 4 of this report and is subject to regulatory approval.
- **Retention-compatible subject to mitigation measures:** Trees that are subject to moderate encroachment from the proposed development that are deemed compatible for retention, subject to implementation of specific mitigation measures, under the current design. Retention of these trees is only considered compatible granted they follow the specific mitigation measures discussed in Section 4.4, well as the general tree protection guidelines outlined in Section 4.3.
- **Retention-compatible:** Trees that are subject to minor encroachment from the proposed development that are deemed compatible for retention under the current design. These trees must follow the general tree protection measures outlined in Section 4.3 in accordance with AS4970-2025.
- **Retention compatibility to be determined via further investigation:** Trees subject to major encroachment that are desired for retention by the Proponent. Retention feasibility is to be determined through root investigations prior to works commencing. While trees in this category are currently considered retention-incompatible, should the outcomes of root mapping reveal that the structural roots of this tree are situated in such a position that the level of impact is conducive to tree retention, then the Project arborist may deem the tree to be retention-compatible, subject to mitigation measures. Final determination is to be made on site by the Project Arborist before works begin.

While AS4970-2025 provides some allowance for the Project Arborist to argue for trees subject to high impact to be retained, the proposed use of this development (school site) increases the likelihood for hazardous outcomes should impacted trees fail, destabilise, or die. Therefore, caution has been applied when considering tree outcomes.

3. Results and discussion

A total of **117** trees in or within 15 m proximity to the site, were considered in relation to the proposed activity as described in Section 1.

Numerical results of the AIA are summarised in Table 2 and mapped in Appendix C. Tree outcomes are shown in Figure 4 and detailed results are tabulated in Appendix E. Tree protection guidelines are provided in Section 4 and Appendix F. Photos of trees may be provided upon request.

Table 2: Summary of tree retention values, impacts and proposed actions

	Retention-incompatible	Retention compatibility to be determined via root investigation*	Retention-compatible subject to mitigation measures		Retention-compatible		
Retention Value	High Impact: >20% NRZ encroachment and/or SRZ encroachment	High Impact: >20% NRZ encroachment and/or SRZ encroachment	High Impact: >20% NRZ encroachment and/or SRZ encroachment	Moderate Impact: 10-20% NRZ encroachment and no SRZ encroachment	Low Impact: <10 NRZ encroachment and no SRZ encroachment	No Impact: 0% NRZ and no SRZ encroachment	Total
High	8	2		6	4	2	22
Medium	22			7	3	25	57
Low	16		1			21	38
Total	46	2	1	13	7	48	117

*Determination to be made prior to works commencing.

3.1. Retention-incompatible trees

The retention of **46** trees are considered incompatible with the activity, based on the level of encroachment from the proposed activity. All 46 of these trees are subject to a high impact (NRZ encroachment >20% and/or SRZ encroachment) from the proposed activity. Retention values and tree IDs are outlined below, and specific NRZ encroachment percentages for these trees are outlined in Appendix E:

- **High retention value: eight** trees (Trees 134, 35, 41, 42, 48, 60, 62 and 65).
- **Medium retention value: 22** trees (Trees 14, 36, 38, 39, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 105, 106, 107, 108 and 113a).
- **Low retention value: 16** trees (Trees 7,13, 31, 32, 33, 43, 44, 45, 46, 47, 57, 58, 104, 109, 110, and 111).

Several high and medium retention value trees are considered incompatible with the current footprint. It is of the Project Arborist's opinion that further investigation into the plausibility to retain these trees under the current design is unnecessary due to the proposed land use. As the broader site is proposed to provide a functioning primary and preschool, this will involve high levels of traffic (both vehicular and pedestrian) involving staff, parents and students. Evolving literature suggests that trees that experience root impacts during developments, particularly more mature trees, are more susceptible to being wind-thrown or failing in the future (Moore, 2014). The inspections undertaken

by Moore (2014) revealed that damage to exposed lateral roots, the loss of descending roots, and evidence of soil compaction at the base of the tree were often coincident with windthrow. Therefore, this assessment has considered all levels of cut and fill an impact to trees and has considered trees with NRZ encroachment greater than 20% or any SRZ encroachment, retention-incompatible, in line with AS4970-2025 as well as in the interest of preventing future hazards within the school site.

It is expected that all trees identified as not viable for retention will be subject to the outcome of the REF determination. As such, the Flora and Fauna Assessment (ELA, 2026) should be considered in conjunction with all applicable statutory and planning controls.

3.2. Retention compatibility to be determined via root investigation prior to the commencement of works

A total of **two** trees (Tree 1 and Tree 64) are subject to high levels of encroachment (greater than 40%) from the proposed activity. Works within the NRZs of these trees include pavement (west) and building construction (east) as well as associated cut and fill. These trees have been as determined by the standard method for NRZ encroachment (AS4970-2025) and would typically be identified as retention-incompatible. However, as retention of these trees is desired by the Proponent, detailed root investigations must be completed to confirm if tree retention achievable.

It is important to note that the detailed root investigations must take place before any ground works occur on the site.

Root investigations will enable the location and extent of structural roots to be determined, and the level of impact more accurately assessed along the proposed extent of impacts along Worrigeer Road and the building boundary. This means that while the tree is currently considered retention-incompatible, should the outcomes of root mapping reveal that the structural roots of this tree are situated in such a position that the level of impact is conducive to tree retention, then the Project arborist may deem the tree to be retention-compatible, subject to mitigation measures. Final determination is to be made on site by the Project Arborist before works commence. This mitigation measure is discussed further in Section 4.4 and Table 4.

3.3. Retention-compatible subject to specific tree protection measures trees

A total of **14** trees are recommended for retention subject to specific tree protection measures, additional to those outlined in AS4970-2025. Of these 14 trees, 13 are subject to moderate impacts (10-20% NRZ encroachment) from the proposed activity. One tree (Tree 134) is subject to high impact from the proposed activity, however, as this tree is relatively young and is provided a reasonable TPZ area within the private property, this tree is considered retention-compatible. It is anticipated that over the medium term this tree (Tree 134) will develop a satisfactory root system. The satisfactory root system will provide the tree with both stability and adequate water and minerals.

Retention values and tree IDs are outlined below, and specific NRZ encroachment percentages for these trees are outlined in Appendix E:

- **High retention value: six** trees (Trees 2, 3, 11, 50, 61, and 63)
- **Medium retention value: seven** trees (Trees 5, 8, 90, 113, 114, 115, and 116).
- **Low retention value: one tree** (Tree 134)

Specific tree protection measures for these trees are outlined in Section 4.4. The viability of these trees for retention relies on the assumption that there will be no additional activity within each NRZ beyond the footprint shown in Figure 4.

3.4. Retention-compatible

A total of **55** trees are recommended for retention due to being subject to low (<10% NRZ encroachment and no SRZ encroachment) or no impact (no NRZ and SRZ encroachment) from the proposed activity. While considered viable for retention these trees will require general protection measures during construction as outlined in Table 3. Retention values and tree IDs are outlined below, and specific NRZ encroachment percentages for low impact trees are outlined in Appendix E:

- **High retention value: six** trees (6, 10, 51, 52, 53, and 54).
- **Medium retention value: 28** trees (Trees 4, 15, 17, 54a, 56, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 112, 117, 122, and 135).
- **Low retention value: 21** trees (Tree 9 [group of five], 59, 118, 119, 120, 121, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, and 133).

Tree management including the tree protection plan for these trees to be retained, along with hold points, inspection schedules and arborist certification are outlined in Section 4.1 of this report.



Figure 4: Tree outcomes

4. Tree protection specification

This tree protection plan should be applied to all trees to be retained as listed in Section 3.3 and 3.4, and 3.2 should these Trees (Tree 1 and 64) be determined as retention-compatible following root investigation. General tree protection measures must be applied to all trees to be retained, as outlined in Section 4.3. All mitigation measures are summarised in Section 5.

An AQF Level 5 Consulting Arborist **must** be engaged to supervise any activity within the TPZ of trees to be retained, provide advice regarding tree protection, and monitor compliance. The project arborist is required to ensure all tree protection measures are implemented, as outlined in this plan, along with any other measures conditioned by the determining authority or deemed necessary during activities. All tree protection measures applicable are summarised in Table 3 and further information is provided in Appendix F.

4.1. Qualifications and Consent

- Removal or pruning of any of the subject trees is subject to determination of the REF. Approved tree works should not be carried out before the installation of tree protection measures.
- All tree pruning (including roots), and removal is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- All tree work must be 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).
- 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 4970-2025 - Protection of trees on development sites*.
- If any additional trees are proposed to be removed during the construction phase that are not identified for removal in this report (i.e., those in the 'retain' or 'retain if possible' categories), this will require additional assessment.

4.2. Hold points, inspection, and certification

A project arborist (AQF Level 5 Consulting Arborist) needs to be engaged to supervise work within the TPZ of trees identified for retention. A project arborist should be engaged to provide advice regarding tree protection and to monitor compliance.

Alterations to this schedule may be required due to necessity, however, this shall be through consultation with the project arborist only.

A copy of this report must be available on-site prior to the commencement of works, and throughout the entirety of the project.

Hold points have been specified in the schedule of works below to ensure trees are adequately protected during construction. It is the responsibility of the principal contractor to complete each of the tasks.

4.2.1. Pre-construction

Further investigation of Tree 1 and 64

Root investigations of Tree 1 and 64 must be undertaken along the proposed extent of works along the alignments shown in Figure 5. These investigations must be carried out by an AQF Level 5 Arborist

to confirm the location, depth, and size of structural roots. The purpose of this investigation is to accurately determine the level of impact by verifying whether significant roots occur within the areas identified as impact zones in this assessment (Figure 8 - Figure 11). If root presence in these areas is conducive to a lower level of impact, than calculated by the standard method for NRZ encroachment (AS4970-2025), the Project Arborist may determine that retention of these trees is feasible. Conversely, if root mapping indicates that the position of structural tree roots within the work zone results in a similar or increased level of impact to that already determined, then the Project Arborist would need to consider the tree to be retention-incompatible. Should removal be required, appropriate approvals must be obtained prior to removal.

Tree Marking

Trees that are approved for removal should be indicated clearly on site with spray paint on trunks. Trees identified for removal should not be removed until tree protection measures for retained trees are installed and deemed to be in accordance with AS 4970-2025 by the Project Arborist. See Section 4.4 for specific measures relating to tree protection fencing.

Pre-commencement Meeting

Prior to any construction, an onsite meeting should be conducted with attendee's subject but not limited to the project arborist, site manager and construction personnel team to walkthrough the general tree protection measures installed for trees to be retained. This meeting should also be conducted to inspect trees listed in Section 3.3 to discuss detailed work methodologies, to identify whether further protection measures are required.

4.2.2. During construction

Monthly Tree Protection Inspections

Monthly inspection of trees by the project arborist (or other timing as agreed with the project arborist) is recommended to be completed on trees to be retained.

Supervision of TPZ Works

The project arborist must supervise all works to be completed within the TPZ of trees to be retained and provide advice regarding tree protection and monitor compliance.

4.2.3. Post-construction

Final Sign-off Inspection

A final inspection of trees to be retained should be undertaken by project arborist after all major construction has ceased and following the removal of tree protection measures.

4.2.4. Reporting

The project arborist is to provide brief summary reports throughout works (i.e., following pre-construction stage, following monthly inspections, and at final sign-off), detailing tree protection measures and providing recommendations for further work or rectification of measures (if required).

4.2.5. Replacement planting

Any loss of trees regardless of retention value should be offset with replacement planting. While no specific policy applies under Part 5 of the EP&A Act, replacement planting should be afforded within the landscape plans to provide canopy coverage and to offset removal. It is recommended that a

minimum 1:1 replacement ratio is utilised. Consultation with the project arborist, project ecologist, or Council's Tree Officer may be undertaken to guide the replacement schedule, if required.

4.3. General tree protection measures

All tree protection measures required throughout the phases of construction in accordance with AS4970-2025 are detailed in Table 3. ELA has provided comment on particular items, to give more detail in regard to protection specifications. Table 3 outlines timing, responsibility, and methods of compliance for all tree protection measures.

Table 3: Tree protection measures

AS4970-2025 Section	Specification	Comment	Timing	Responsibility	Project arborist role
5.3.1	Tree Marking Trees for removal or transplanting should be marked onsite as per the approved tree protection plan. Before removal, the project arborist should confirm that all marked trees correspond with those shown on the schedule or plan.	Indicate clearly (with spray paint on trunks) trees marked for removal.	To be conducted prior to commencement of work and removal of any trees. Applicable to all trees approved to be removed.	Site Manager	Arborist pre-construction inspection report
4.3	Protective Fencing Fencing should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition. Once erected, protective fencing must not be removed or altered without approval by the project arborist. The TPZ should be secured to restrict access. AS4687 specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter, and liquids onto the protected area.	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, <i>AS 4687-2007, Temporary fencing and hoardings</i> . 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 4970-2025, Protection of Trees on Development Sites. Tree protection fencing shall be: Enclosed to the full extent of the TPZ (or as described in Section 4.4).	All tree protection fencing to be erected prior to works commencing. Applicable to all trees to be retained.	Site Manager	Arborist pre-construction inspection report

AS4970-2025 Section	Specification	Comment	Timing	Responsibility	Project arborist role
	Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of protection fencing.	• Cyclone chain wire link fence or similar, with lockable access gates. • Certified and Inspected by the project arborist. • Installed prior to any machinery or material are brought to site and before the commencement of works. Signage erected as per AS4970 (refer to illustration in Appendix E).			
4.4	Signs Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site. The lettering on the sign should comply with AS 4970-2025.	Fencing is to be prominently sign posted with 300 mm x 450 mm boards stating, "NO ACCESS - TREE PROTECTION ZONE".	All signage is to be erected prior to works commencing. Applicable to all trees to be retained.	Site Manager	Arborist pre-construction inspection report
3.3.6	Crown Protection Tree crowns may be injured by machinery such as excavators, drilling rigs, cranes, trucks, hoarding installation and scaffolding. The TPZ may need to include additional protection of the above ground parts of the tree. Where crown protection is required, it will usually be located at least one metre outside the perimeter of the crown. The erection of scaffolding may require an additional setback from the edge of the crown. Crown protection may include pruning, tying-back of branches or other measures. If pruning is required, requirements are specified in AS 4373 and should be undertaken before the establishment of the TPZ. NOTE: Pruning may require approval from the determining authority.	As per AS4970 Section 3.3.6.	As required, under direction of project arborist.	Site Manager	During construction inspection report

AS4970-2025 Section	Specification	Comment	Timing	Responsibility	Project arborist role
4.5.2	Trunk and branch protection Where necessary, install protection to the trunk and branches of trees. The materials and positioning of protection are to be specified by the project arborist. A minimum height of 2 m is recommended. Do not attach temporary powerlines, stays, guys and the like to the tree. Do not drive nails into the trunks or branches.	Where provision of tree protection fencing is impractical or must be temporarily removed, trunk and branch 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. The timbers shall be wrapped around the trunk but not fixed to the tree, as this will cause injury/damage to the tree (refer to illustration in Appendix F).	All trunk and branch protection is to be erected prior to works commencing. As required, under direction of project arborist.	Site Manager	Arborist pre-construction inspection report
4.5.3	Ground protection If temporary access for machinery is required within the TPZ, ground protection measures will be required. The purpose of the ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards. These measures may be applied to root zones beyond the TPZ.	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. Maintain a thick layer of mulch around all retained trees to a depth of 100 mm using coarse pine bark or wood chip material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g., garden beds or turf) mulch may not be required.	All ground protection is to be erected prior to works commencing (and during works) as required and specified by the project arborist	Site Manager	Arborist pre-construction and during construction inspection report/s

AS4970-2025 Section	Specification	Comment	Timing	Responsibility	Project arborist role
		For heavy vehicle access within TPZ, ground protection may include a permeable membrane such as geotextile fabric beneath a layer of 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.			
4.5.4	Root protection during works within the TPZ Some approved works within the TPZ, such as regrading, installation of piers or landscaping may have the potential to damage roots. If the grade is to be raised the material should be coarser or more porous than the underlying material. Depth and compaction should be minimized. Manual excavation should be carried out under the supervision of the project arborist to identify roots critical to tree stability. Relocation or redesign of works may be required. Where the project arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws, or chainsaws. Pruning wounds should not be treated with dressings or paints. It is not acceptable for roots within the TPZ to be 'pruned' with machinery such as backhoes or excavators. Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out. This may include jute mesh or hessian sheeting as multiple layers over exposed roots and excavated soil profile, extending to the full depth of the root zone. Root protection sheeting	If incursions/excavation within the TPZ are unavoidable, root investigation may be needed to determine the extent and location of roots within the area of construction activity. This decision is to be made by the project arborist only. The location and distribution of roots are found through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation. Root investigation does not guarantee the retention of the tree. 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. Pruning works must be undertaken by an arborist with a minimum Level 3 AQF.	Decided during the pre-commencement meeting, or at any time during works.	Site Manager	Arborist during construction inspection reports (and root investigation reports if necessary)

AS4970-2025 Section	Specification	Comment	Timing	Responsibility	Project arborist role
	should be pegged in place and kept moist during the period that the root zone is exposed. Other excavation works in proximity to trees, including landscape works such as paving, irrigation and planting can adversely affect root systems. Seek advice from the project arborist.				
4.6.1	Maintaining the TPZ – Mulching The area within the TPZ should be mulched. The mulch must be maintained to a depth of 50–100 mm using material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g., garden beds or turf) mulch may not be required.	As per AS4970 Section 4.6.1.	All mulching within TPZs to be completed prior to works commencing. Applicable to all trees to be retained.	Site Manager	Arborist pre-construction inspection report
4.6.2	Maintaining the TPZ – Watering Soil moisture levels should be regularly monitored by the project arborist. Temporary irrigation or watering may be required within the TPZ. An above-ground irrigation system should be installed and maintained by a competent individual.	As per AS4970 Section 4.6.2.	As required under instruction of project arborist. Applicable to all trees to be retained.	Site Manager	During construction inspection reports
4.6.3	Maintaining the TPZ – Weed Removal All weeds should be removed by hand without soil disturbance or should be controlled with appropriate use of herbicide.	As per AS4970 Section 4.6.3.	As required under instruction of project arborist. Applicable to all trees to be retained.	Site Manager	During construction inspection reports

4.4. Specific tree protection measures

This section relates to the additional tree protection measures to be implemented for the retention of trees listed under Section 3.3. As these trees are subject to either 10-20% NRZ encroachment or >20% NRZ encroachment, retention of these trees rely on adequate protection and supervision of works within the NRZ. Measures recommended, additional to those outlined in Section 4.3, are outlined below:

Trees requiring further investigation (Tree 1 and 64; Section 3.2):

- Root investigations of Tree 1 and Tree 64 must be undertaken along the proposed extent of works along Worrigee Road and the proposed building, as shown in Figure 5. These investigations must be carried out by an AQF Level 5 Arborist to confirm the location, depth, and size of structural roots. The Project Arborist is to then determine on site whether the tree is feasible for retention, or if it is considered incompatible with the proposed works.
- The location and distribution of roots are found through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation. As mentioned above, root investigation does not guarantee the retention of the tree.
- If the above investigations determine either tree is retention-compatible, final locations proposed utilities and services must not be situated within the NRZ or SRZ of these trees if laid using trenching. If utilities and services must run through these areas, these must be installed using horizontal directional drilling.

Retention-compatible subject to mitigation measures (Section 3.3):

- Tree protection fencing around each tree, or around groups containing these trees, are to compensate for the impacts to occur doing construction by providing additional root space i.e. be located beyond the NRZ where possible. Nominal fencing locations are shown in Figure 5. The Project Arborist may request changes to the location of fencing on site during the pre-construction inspection to ensure adequate compensation is provided.
- No parking, stockpiling, refuelling, or any other works can be undertaken within the protected portion of these trees.
- All vehicle access and use of heavy machinery, or vehicles, is not permitted within the TPZ shown in Figure 5 unless approved by the Project Arborist.
- Areas highlighted in orange in Figure 5 are understood to require some work within the NRZ, such as landscaping or construction of raised pathways etc. Ground protection in accordance with AS4970-2025 must be installed in these areas prior to works occurring within the NRZ of trees to be retained.
- As the location of footings for raised structures such as pathways and bike parking was not made available at the time of this assessment, these locations **must** be determined in consultation with the Project Arborist to avoid roots where possible.
- An AQF Level 5 Arborist must approve any removal or movement of the tree protection fencing and supervise any vehicle movement or works within the NRZ of trees.
- Vehicle movements/set down areas were not assessed as part of this assessment. Should vehicle movement be unavoidable within the NRZ of these trees, and be approved by the Project Arborist, appropriate ground protection must be installed prior, in accordance with AS4970-2025 (Appendix F).

- All works within the encroached portion of the NRZ **must** be supervised by an AQF Level 5 Arborist, as outlined in Table 4.
- As proposed utilities and services are not *frozen* in location at the current time, final locations must not be situated within the NRZ or SRZ of these trees if laid using trenching. If utilities and services must run through these areas, these must be installed using horizontal directional drilling.



Figure 5: Tree Protection Plan

5. Mitigation measures

The following table outlines the standard mitigation measures to be implemented during construction in order to minimise impacts to trees to be retained.

Table 4: Mitigation measures

ID	Mitigation Measure Name	Mitigation Measure	Timing	Relevant Section of This Report
E1	Tree Protection	Trees not approved to be pruned or removed are to be protected and maintained in accordance with <i>AS 4970-2025 Protection of Trees on Development Sites</i> . Tree protection must be approved by a Consulting Arborist AQF Level 5. Protections are to remain in place until the completion of all construction work in the vicinity of the protected trees. Specific tree protection measures listed in Table 3 of this AIA are to be complied with where relevant.	During Construction	Throughout report
E2	Tree Removal or Pruning	Tree pruning or removal is to be carried out by an Arborist with a minimum AQF Level 3 qualification in Arboriculture. Any tree pruning must be in accordance <i>AS 4373-2007 Pruning of amenity of Trees</i> . Immediately prior to tree removal, an ecologist or similarly qualified personnel must inspect for the presence of fauna, and capture and relocate as required. Where nesting or habitat hollows are present on trees being removed, this section of the tree must be removed and re-used on site or in the local area.	During Construction	Section 4
E6	Replacement Planting	Removal of native vegetation for construction must be replaced by trees at a minimum ratio of 1:1	During Construction	Section 4.2.5
-	Root Investigation	Retention of Tree 1 and Tree 64 is to be determined via root investigation by an AQF Level 5 Arborist prior to works commencing as per the Tree Protection Plan. Works may not commence until the outcome for this tree has been determined, and if required, the appropriate approvals are obtained.	Pre Construction	Section 3.2, Section 4.2.1, Section 4.4, and Figure 5.

5.1. Adequacy Review

Table 5 below provides a review of the minimum requirements set out in the NSW DoE REF Review Checklist (DOC24/3137063 Revision 1 December 2024) and includes an extract of the relevant part of the checklist, as well as a comment confirming which section of this report satisfies each requirement.

Table 5: Summary of arboricultural REF requirements

Requirement	Y	N	NA	Comments
Trees and landscaping				
Has an Arboricultural Impact Assessment (AIA) been prepared to support the REF which assesses existing trees within the proposed works area, including street trees, and recommends tree protection measures for trees to be retained?	☒	☐	☐	
Does the REF discuss the number, species, pot sizes and height of trees to be removed and trees to be planted?	☒	☐	☐	Section 3 and Appendix E

5.2. Evaluation of Environmental Impacts

For information regarding the extent and nature of potential ecological and biodiversity impacts resulting from the removal of 46 trees, refer to the *Worrigee New Public Preschool – Flora and Fauna Assessment* prepared by ELA (ELA, 2026). To summarise, this assessment determined that “the proposed activity is not likely to significantly affect the environment in relation to ecology matters.

In relation to the 69 trees identified as viable for retention, as well as the two trees with potential for retention subject to root investigations, from an arboricultural perspective the nature of the impacts resulting from the proposed activity are low and will not have a significant impact on the community based on the current level of NRZ encroachment (< 20 %). Any potential impacts can be appropriately mitigated to ensure that there is minimal impact on the community, particularly for tree subject to 10-20% NRZ encroachment, see Section 4.4.

For the conclusive statement confirming that the activity as a whole will not cause a significant impact to the environment, refer to the REF for this site.

6. Conclusion

This AIA determined that of the 117 trees assessed, viable retention of **46** trees is considered incompatible with the proposed works relating to the construction of the New Primary School in Worrigee, due to the level of encroachment (>20% NRZ encroachment and/or SRZ encroachment) from the proposed activity. Of these 46 trees, a total of 8 high retention value trees are deemed incompatible for retention based on the proposed activity.

A total of **two** trees (Tree 1 and 64) are subject to high impact (>20% NRZ encroachment) and require detailed root investigations that must be completed to confirm if tree retention is achievable. Retention of these trees is desired by the Proponent. This determination is to be made by the Project Arborist on site, prior to on-ground works commencing.

A total of **14** trees are considered retention compatible subject to mitigation measures, due to mostly being subject to moderate impact from the proposed activity (10-20% NRZ encroachment). Both the general and specific protection measures outlined in the TPS (Section 4) apply to these trees. The remaining **55** trees are considered retention compatible due to low (<10% NRZ encroachment) or no impact from the proposed work. The general protection measures outlined in the TPS and TPP apply to these trees.

Any loss of trees regardless of retention value should be offset with replacement planting. While no specific policy applies under Part 5 of the EP&A Act, replacement planting should be afforded within the landscape plans to provide canopy coverage and to offset removal. It is recommended that a minimum 1:1 replacement ratio is utilised. Consultation with the project arborist, project ecologist, or Council's Tree Officer may be undertaken to guide the replacement schedule, if required.

Subject to implementing the mitigation measures set out in Table 4 of this report, the conclusion of this assessment is that the proposed activity is not likely to significantly affect the environment in relation to arboricultural matters.

7. References

7.1. General references

- Barrell, J. 2001. 'SULE: Its use and status into the new millennium', in *Management of mature trees*, Proceedings of the 4th NAAA Tree Management Seminar, NAAA, Sydney.
- Brooker M.I.H, Kleinig D.A. 2006. *Field Guide to Eucalypts. Volume 1, South-eastern Australia*, 3rd ed Blooming Books, Melbourne
- Draper, B. and Richards, P., 2009. *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.
- Harris, R.W., Matheny, N.P., and Clark, J.R., 1999. *Arboriculture: integrated management of landscape trees, shrubs, and vines*, Prentice Hall, Upper Saddle River, New Jersey.
- Mattheck, C. and Breloer, H. 1994. 'Field Guide for Visual Tree Assessment' *Arboricultural Journal*, Vol 18 pp 1-23.
- Mattheck, C. 2007. *Updated Field Guide for Visual Tree Assessment*. Karlsruhe: Forschungszentrum Karlsruhe.
- Matheny, N. and Clark, J.J. 1998 Trees and Development – A technical guide to preservation of trees during land development. International Society of Arboriculture, Champaign, Illinois, USA.
- IACA 2010. *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturalists, Australia, www.iaca.org.au.
- Robinson L, 2003. *Field Guide to the Native Plants of Sydney*, 3rd ed, Kangaroo Press, East Roseville NSW.
- SafeWork Australia. 2016. *Guide to managing risks of tree trimming and removal work*. SafeWork, NSW.
- Standards Australia 2007. *Australian Standard: Pruning of amenity trees, AS 4373 (2007)*, Standards Australia, Sydney.
- Standards Australia 2025. *Australian Standard: Protection of trees on development sites, AS 4970 (2025)*. Standards Australia, Sydney.

7.2. Project specific references

- Bennett and Trimble. 2026. Indicative Site Plan – Ground. Prepared for the Department of Education.
- Eco Logical Australia. 2026a. Worrigee New Public Preschool Arboricultural Impact Assessment, version 1. Prepared for the Department of Education.
- Eco Logical Australia 2026b. Worrigee New Public School Flora and Fauna Assessment, version 1. Prepared for the Department of Education.
- Indesco. 2026. X-11067-DESIGN WORRIGEE PS-MS-Isopach_100mm [drawing].
- Indesco. 2026. Stormwater Management Plans – Sheet 2. Prepared for Department of Education.
- JMD Design. 2026. JMD_LANDSCAPE BASE_Worrigee Concept-tree coordination [drawing].
- Lucid. 2026. Electrical Services Concepts – Site Plan. Prepared for the Department of Education.

Moore, G.M. 2014. Wind-thrown trees: Storms or management? *Arboriculture & Urban Forestry*, 40(2), pp.53–69.

Shoalhaven City Council. 2014. *Shoalhaven Development Control Plan 2014, Chapter G4 Tree and Vegetation Management*.

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.

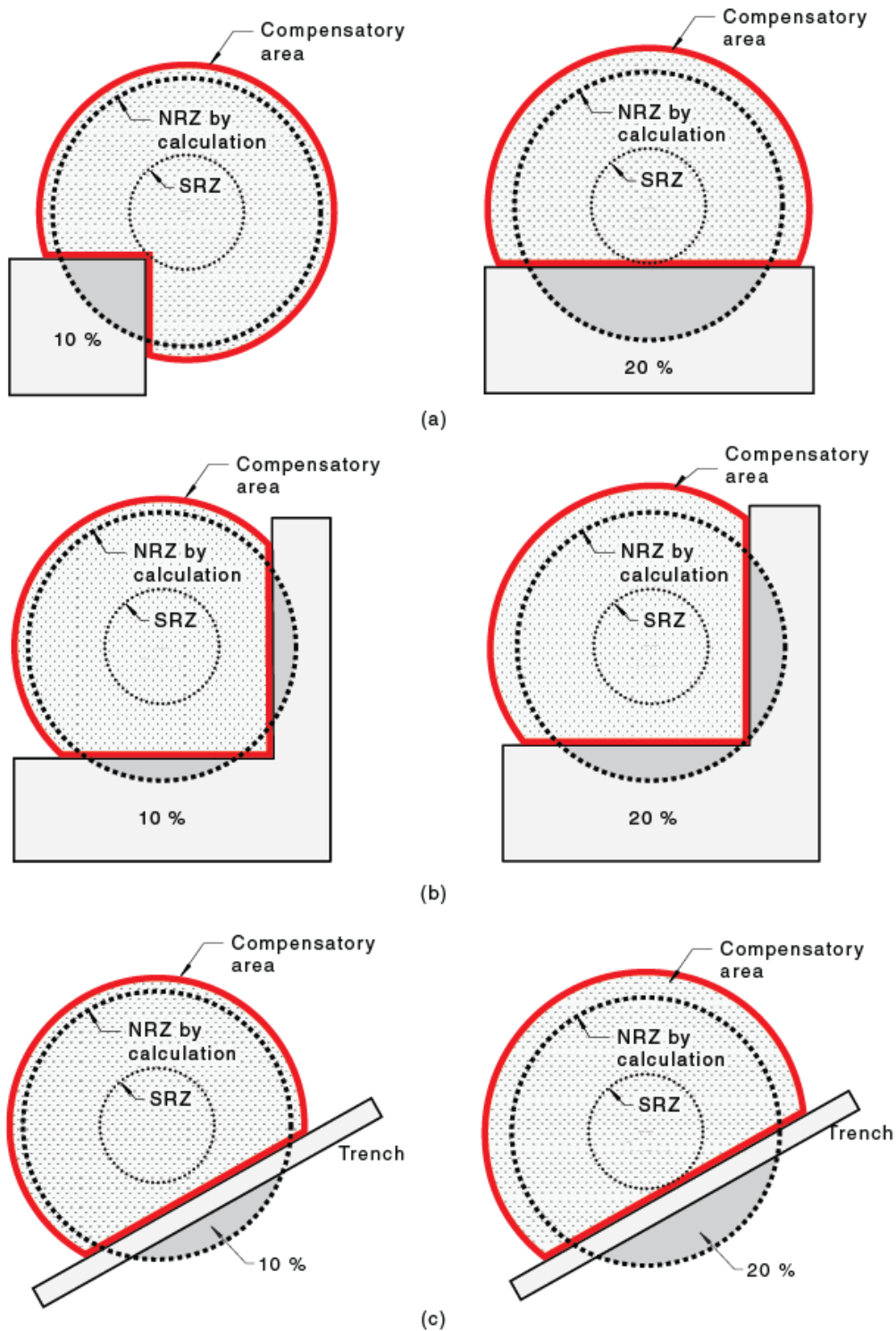
Low	Medium	High
The tree is in fair-poor condition and good or low vigour. The tree has form atypical of the species. The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings. The tree provides a minor contribution or has a negative impact 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. 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.	The tree is in fair to good condition and good or low vigour. The tree has form typical or atypical of the species. The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area. The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street. The tree provides a fair contribution to the visual character and amenity of the local area. The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.	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 Council's 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.

A2 Matrix assessment - STARS©

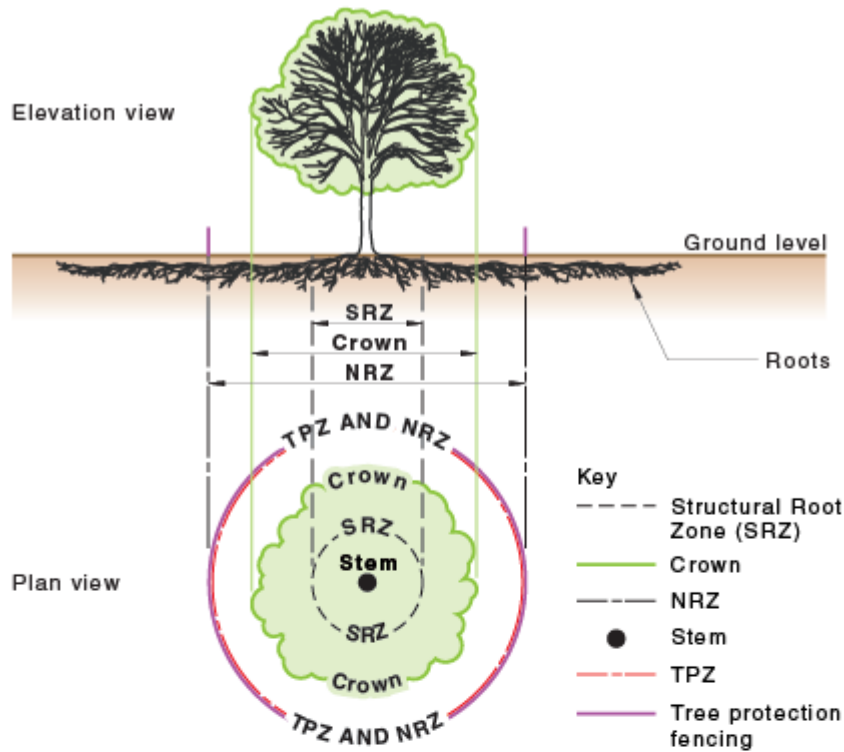
		Tree significance				
		High	Medium	Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest/Noxious Weed Species	Hazardous/ Irreversible Decline
Useful Life Expectancy	Long >40 years					
	Medium 15-40 years					
	Short <1-15 years					
	Dead					

	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 <i>Australian Standard AS4970 Protection of trees on development sites</i>. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.
	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.
	Low: Tree not considered important for retention, nor requiring special works or design modification to be implemented for their retention.
Priority for removal: These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.	

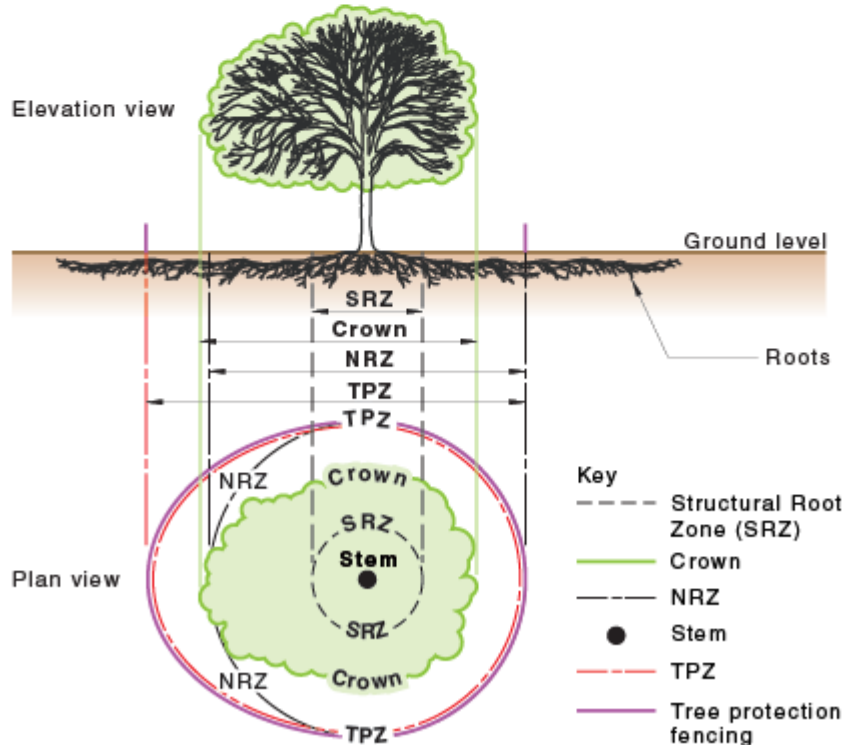
Appendix B Encroachment into tree protection zones - AS 4970-2025



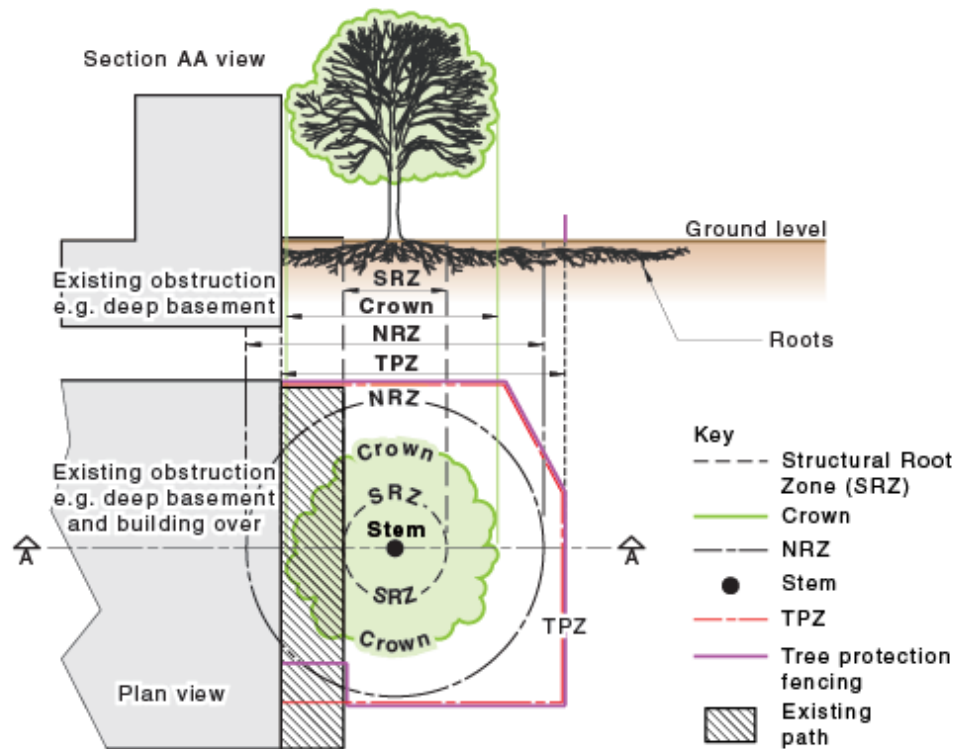
Appendix C TPZ determination (Section 3.4 of AS4970-2025)



(a) No development within NRZ

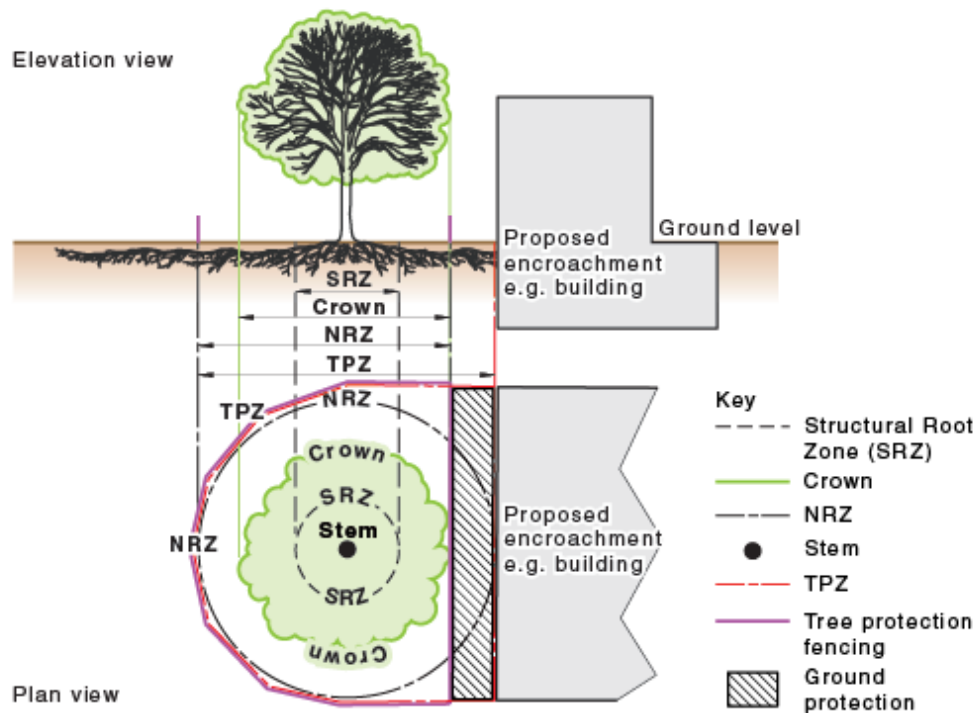


(b) No development within NRZ but with crown protection required



NOTE The project arborist has determined a suitable location for the tree protection fence. They have included a portion of the path as ground protection.

(c) TPZ compensatory area shown for existing structures



(d) TPZ compensatory area shown for proposed development

Appendix D Maps



Figure 6: Tree locations



Figure 7: Retention values

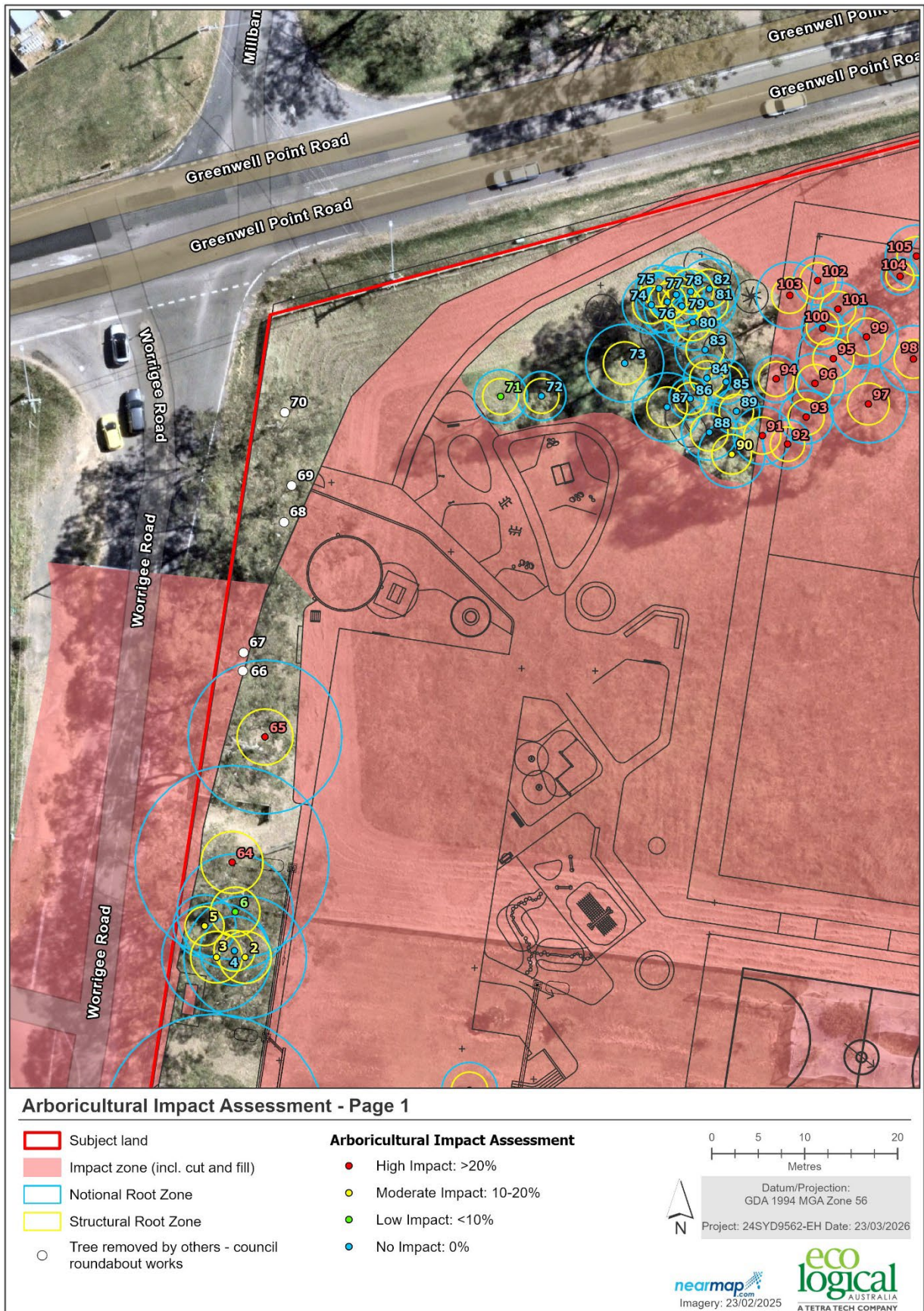


Figure 8: Arboricultural Impact Assessment – page 1

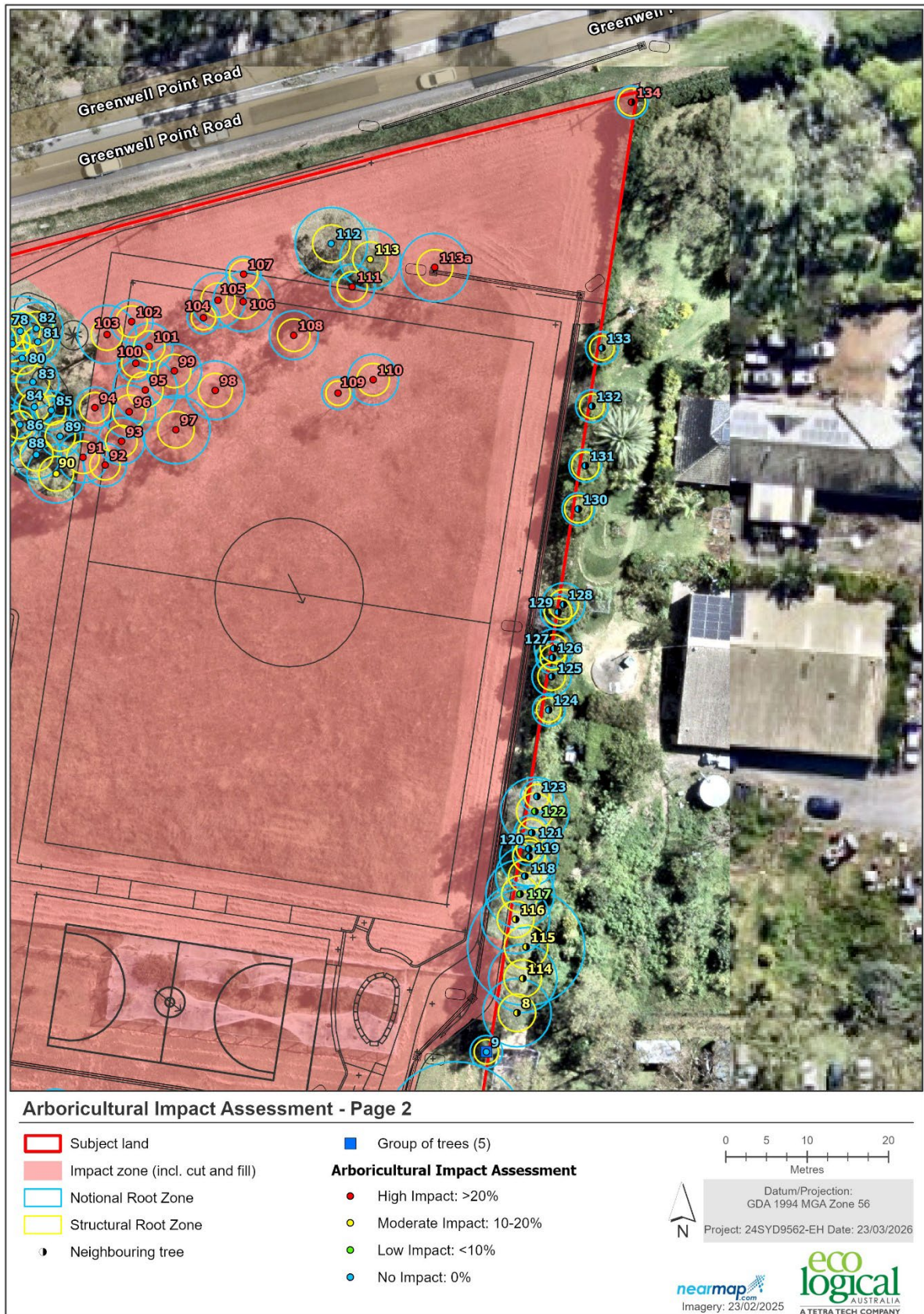


Figure 9: Arboricultural Impact Assessment – page 2



Figure 10: Arboricultural Impact Assessment – page 3

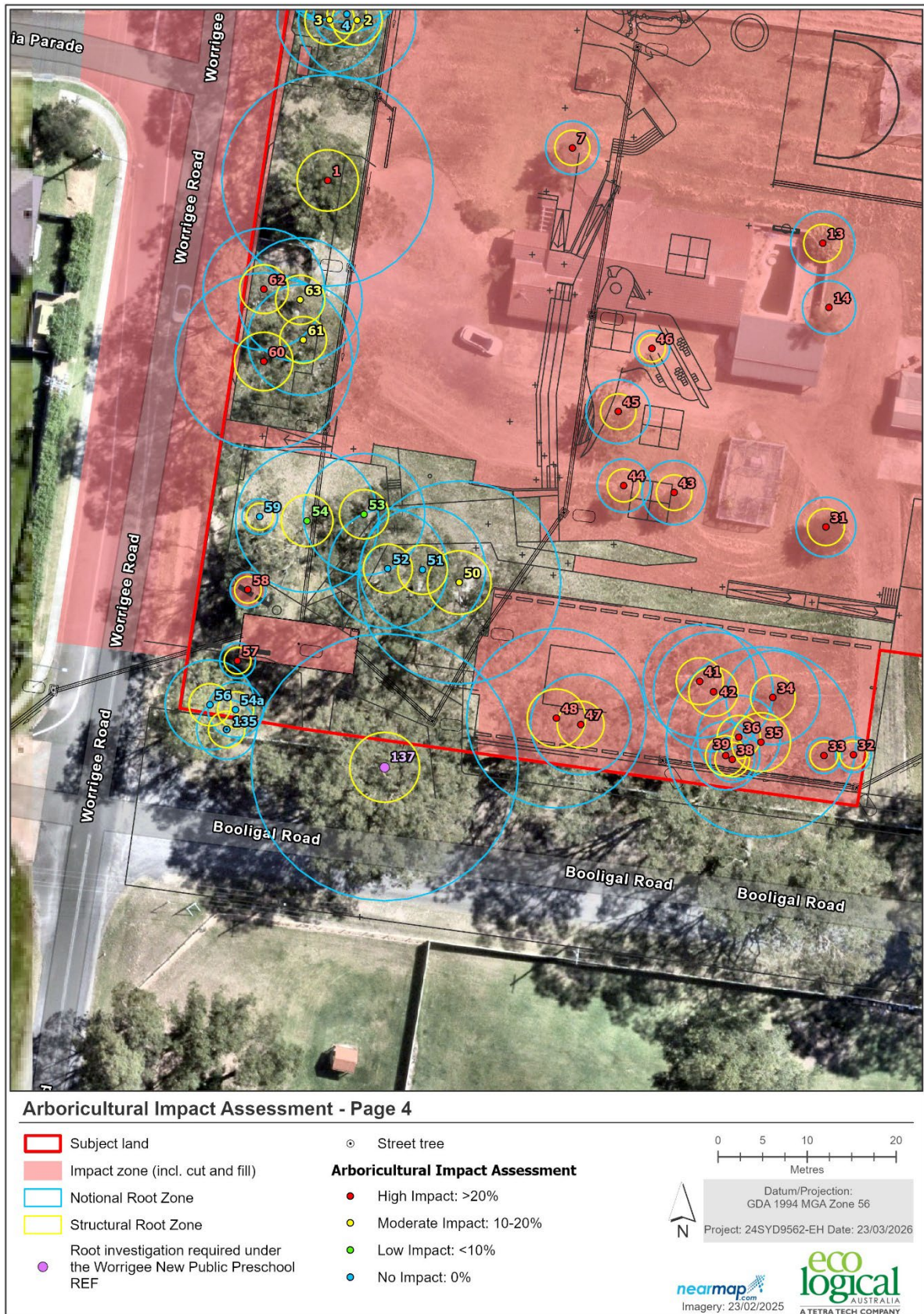


Figure 11: Arboricultural Impact Assessment – page 4

Appendix E Tabulated results of the Arboricultural Impact Assessment

Table 6: Tabulated results of the Arboricultural Impact Assessment

Tree ID	Botanical name	Trees in group	Height (m)	Spread (m)	DSH (mm)	DAB (mm)	Health	Structure	ULE	Landscape Significance	Retention Value	Age	NRZ	SRZ	NRZ encroachment (%)	SRZ encroached	Impact	Neighbouring/street tree	Tree Outcome	Comment
1	<i>Eucalyptus paniculata</i>	1	23	17	990	1100	Good	Fair	Medium (15-40 years)	High	High	Mature	11.88	3.44	45		High Impact: >20%		Retention compatibility to be determined via root investigation prior to the commencement of works	Tear outs, probable decay in upper trunk
2	<i>Corymbia maculata</i>	1	18	11	550	680	Good	Good	Medium (15-40 years)	High	High	Mature	6.6	2.81	18		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
3	<i>Corymbia maculata</i>	1	18	10	490	660	Good	Good	Medium (15-40 years)	Medium	High	Mature	5.88	2.78	15		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	Asymmetric shape
4	<i>Corymbia maculata</i>	1	14	8	310	380	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.72	2.20	0		No Impact: 0%		Retention-compatible	
5	<i>Corymbia maculata</i>	1	12	6	280	340	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.36	2.10	15		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
6	<i>Corymbia maculata</i>	1	19	14	520	600	Good	Fair	Medium (15-40 years)	High	High	Mature	6.24	2.67	9		Low Impact: <10%		Retention-compatible	
7	<i>Callistemon viminalis</i>	1	5	4	250	290	Good	Good	Medium (15-40 years)	Low	Low	Mature	3	1.97	100	Yes	High Impact: >20%		Retention-incompatible	
8	<i>Casuarina glauca</i>	1	10	5	350	420	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.30	10		Moderate Impact: 10-20%	Neighbouring tree	Retention-compatible subject to mitigation measures	Tree is situated on adjacent property, not tagged
9	<i>Casuarina glauca</i>	5	5	1	100	120	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	0		No Impact: 0%		Retention-compatible	Clump of five small trees growing close together
10	<i>Corymbia maculata</i>	1	15	12	740	950	Fair	Good	Medium (15-40 years)	High	High	Mature	8.88	3.24	10		Low Impact: <10%		Retention-compatible	Twin stems
11	<i>Corymbia maculata</i>	1	19	11	590	700	Fair	Good	Medium (15-40 years)	High	High	Mature	7.08	2.85	12		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
13	<i>Livistona australis</i>	1	5	4	300	350	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	3.6	2.13	100	Yes	High Impact: >20%		Retention-incompatible	Tree is in pool area, not tagged
14	<i>Syagrus romanzoffianum</i>	1	8	4	320	550	Good	Good	Medium (15-40 years)	Medium	Medium	Semi-mature	3	0.00	100	Yes	High Impact: >20%		Retention-incompatible	
15	<i>Ficus rubiginosa</i>	1	4	6	320	320	Good	Good	Medium (15-40 years)	Medium	Medium	Semi-mature	3.84	2.05	0		No Impact: 0%	Neighbouring tree	Retention-compatible	DBH and DAB estimated at ground level, tree is situated on adjacent property, not tagged
17	<i>Callistemon salignus</i>	1	8	6	340	450	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	4.08	2.37	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. Tree is on adjacent property, not tagged

Tree ID	Botanical name	Trees in group	Height (m)	Spread (m)	DSH (mm)	DAB (mm)	Health	Structure	ULE	Landscape Significance	Retention Value	Age	NRZ	SRZ	NRZ encroachment (%)	SRZ encroached	Impact	Neighbouring/street tree	Tree Outcome	Comment
31	<i>Pinus radiata</i>	1	5	4	280	330	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	3.36	2.08	100	Yes	High Impact: >20%		Retention-incompatible	
32	<i>Morus sp.</i>	1	5	4	120	160	Fair	Fair	Medium (15-40 years)	Low	Low	Semi-mature	2	1.53	100	Yes	High Impact: >20%		Retention-incompatible	Bifurcated stem
33	<i>Pinus radiata</i>	1	6	4	140	170	Fair	Fair	Medium (15-40 years)	Low	Low	Semi-mature	2	1.57	100	Yes	High Impact: >20%		Retention-incompatible	
34	<i>Corymbia maculata</i>	1	22	9	440	520	Good	Good	Medium (15-40 years)	High	High	Mature	5.28	2.51	100	Yes	High Impact: >20%		Retention-incompatible	
35	<i>Corymbia maculata</i>	1	20	14	890	1000	Fair	Good	Medium (15-40 years)	High	High	Mature	10.68	3.31	82	Yes	High Impact: >20%		Retention-incompatible	
36	<i>Corymbia maculata</i>	1	15	10	390	480	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	4.68	2.43	100	Yes	High Impact: >20%		Retention-incompatible	
38	<i>Corymbia maculata</i>	1	20	14	210	280	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.52	1.94	100	Yes	High Impact: >20%		Retention-incompatible	
39	<i>Corymbia maculata</i>	1	15	10	320	400	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.84	2.25	99	Yes	High Impact: >20%		Retention-incompatible	
41	<i>Corymbia maculata</i>	1	19	11	530	580	Good	Good	Medium (15-40 years)	High	High	Mature	6.36	2.63	100	Yes	High Impact: >20%		Retention-incompatible	
42	<i>Corymbia maculata</i>	1	24	10	560	650	Good	Good	Medium (15-40 years)	High	High	Mature	6.72	2.76	100	Yes	High Impact: >20%		Retention-incompatible	
43	<i>Ficus rubiginosa</i>	1	3	5	300	300	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	3.6	2.00	100	Yes	High Impact: >20%		Retention-incompatible	DBH and DAB measured at ground level
44	<i>Ficus rubiginosa</i>	1	3	4	250	250	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	3	1.85	100	Yes	High Impact: >20%		Retention-incompatible	DBH and DAB measured at ground level
45	<i>Morus sp.</i>	1	5	6	300	300	Fair	Fair	Medium (15-40 years)	Low	Low	Semi-mature	3.6	2.00	100	Yes	High Impact: >20%		Retention-incompatible	Multi stemmed, DBH and DAB measured at ground level
46	<i>Citrus cv</i>	1	4	3	100	120	Fair	Fair	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	100	Yes	High Impact: >20%		Retention-incompatible	Not tagged
47	<i>Corymbia maculata</i>	1	14	14	470	580	Poor	Poor	Short (5-15 years)	Medium	Low	Over-mature	5.64	2.63	97	Yes	High Impact: >20%		Retention-incompatible	Decay. Fungal fruiting bodies on trunk.
48	<i>Corymbia maculata</i>	1	23	15	840	980	Good	Good	Medium (15-40 years)	High	High	Mature	10.08	3.28	79	Yes	High Impact: >20%		Retention-incompatible	
50	<i>Corymbia maculata</i>	1	22	18	950	1200	Good	Good	Medium (15-40 years)	High	High	Mature	11.4	3.57	16		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
51	<i>Corymbia maculata</i>	1	22	12	590	660	Good	Good	Medium (15-40 years)	High	High	Mature	7.08	2.78	0		No Impact: 0%		Retention-compatible	

Tree ID	Botanical name	Trees in group	Height (m)	Spread (m)	DSH (mm)	DAB (mm)	Health	Structure	ULE	Landscape Significance	Retention Value	Age	NRZ	SRZ	NRZ encroachment (%)	SRZ encroached	Impact	Neighbouring/street tree	Tree Outcome	Comment
52	<i>Corymbia maculata</i>	1	21	12	560	640	Good	Good	Medium (15-40 years)	High	High	Mature	6.72	2.74	0		No Impact: 0%		Retention-compatible	
53	<i>Corymbia maculata</i>	1	23	12	570	650	Good	Good	Medium (15-40 years)	High	High	Mature	6.84	2.76	2		Low Impact: <10%		Retention-compatible	
54	<i>Corymbia maculata</i>	1	24	12	670	730	Fair	Good	Medium (15-40 years)	High	High	Mature	8.04	2.90	1		Low Impact: <10%		Retention-compatible	Sparse canopy
54a	<i>Eucalyptus sp.</i>	1	11	7	260	310	Fair	Fair	Medium (15-40 years)	Medium	Medium	Mature	3.12	2.02	0		No Impact: 0%		Retention-compatible	Wound on trunk from tear out
56	<i>Corymbia maculata</i>	1	12	8	420	450	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	5.04	2.37	0		No Impact: 0%		Retention-compatible	
57	<i>Pinus radiata</i>	1	7	3	120	150	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	21	Yes	High Impact: >20%		Retention-incompatible	
58	<i>Pinus radiata</i>	1	7	3	110	150	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	100	Yes	High Impact: >20%		Retention-incompatible	
59	<i>Pinus radiata</i>	1	8	3	120	150	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	0		No Impact: 0%		Retention-compatible	
60	<i>Corymbia maculata</i>	1	22	15	830	980	Good	Good	Medium (15-40 years)	High	High	Mature	9.96	3.28	44	Yes	High Impact: >20%		Retention-incompatible	
61	<i>Corymbia maculata</i>	1	21	9	520	580	Good	Good	Medium (15-40 years)	High	High	Mature	6.24	2.63	11		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
62	<i>Corymbia maculata</i>	1	20	10	570	640	Good	Good	Medium (15-40 years)	High	High	Mature	6.84	2.74	36	Yes	High Impact: >20%		Retention-incompatible	
63	<i>Corymbia maculata</i>	1	22	10	580	650	Good	Good	Medium (15-40 years)	High	High	Mature	6.96	2.76	12		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
64	<i>Corymbia maculata</i>	1	20	17	870	1020	Good	Fair	Medium (15-40 years)	High	High	Mature	10.44	3.34	42		High Impact: >20%		Retention compatibility to be determined via root investigation prior to the commencement of works	
65	<i>Corymbia maculata</i>	1	19	13	690	800	Good	Fair	Medium (15-40 years)	High	High	Mature	8.28	3.01	45		High Impact: >20%		Retention-incompatible	
71	<i>Corymbia maculata</i>	1	11	5	240	280	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.88	1.94	3	0	Low Impact: <10%		Retention-compatible	
72	<i>Corymbia maculata</i>	1	9	5	220	260	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.64	1.88	0		No Impact: 0%		Retention-compatible	
73	<i>Corymbia maculata</i>	1	12	5	350	420	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.30	0		No Impact: 0%		Retention-compatible	Sparse canopy

Tree ID	Botanical name	Trees in group	Height (m)	Spread (m)	DSH (mm)	DAB (mm)	Health	Structure	ULE	Landscape Significance	Retention Value	Age	NRZ	SRZ	NRZ encroachment (%)	SRZ encroached	Impact	Neighbouring/street tree	Tree Outcome	Comment
74	Corymbia maculata	1	12	5	260	310	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.12	2.02	0		No Impact: 0%		Retention-compatible	
75	Corymbia maculata	1	9	6	210	280	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.52	1.94	0		No Impact: 0%		Retention-compatible	
76	Corymbia maculata	1	12	5	280	310	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.36	2.02	0		No Impact: 0%		Retention-compatible	
77	Corymbia maculata	1	10	6	250	280	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3	1.94	0		No Impact: 0%		Retention-compatible	
78	Corymbia maculata	1	13	5	360	480	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	4.32	2.43	0		No Impact: 0%		Retention-compatible	
79	Corymbia maculata	1	14	5	340	370	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	4.08	2.18	0		No Impact: 0%		Retention-compatible	
80	Corymbia maculata	1	12	5	250	290	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3	1.97	0		No Impact: 0%		Retention-compatible	
81	Corymbia maculata	1	10	5	220	250	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.64	1.85	0		No Impact: 0%		Retention-compatible	
82	Corymbia maculata	1	12	5	270	340	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.24	2.10	0		No Impact: 0%		Retention-compatible	
83	Corymbia maculata	1	13	5	270	320	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.24	2.05	0		No Impact: 0%		Retention-compatible	
84	Corymbia maculata	1	12	5	210	250	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.52	1.85	0		No Impact: 0%		Retention-compatible	
85	Corymbia maculata	1	12	4	200	230	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.4	1.79	0		No Impact: 0%		Retention-compatible	Sparse canopy
86	Corymbia maculata	1	11	4	190	210	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.28	1.72	0		No Impact: 0%		Retention-compatible	Sparse canopy
87	Corymbia maculata	1	11	7	310	370	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.72	2.18	0		No Impact: 0%		Retention-compatible	
88	Corymbia maculata	1	12	4	250	310	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3	2.02	0		No Impact: 0%		Retention-compatible	Sparse canopy
89	Corymbia maculata	1	12	4	210	250	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.52	1.85	0		No Impact: 0%		Retention-compatible	
90	Corymbia maculata	1	11	5	300	350	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.6	2.13	15		Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
91	Corymbia maculata	1	12	4	260	300	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.12	2.00	57	Yes	High Impact: >20%		Retention-incompatible	

Tree ID	Botanical name	Trees in group	Height (m)	Spread (m)	DSH (mm)	DAB (mm)	Health	Structure	ULE	Landscape Significance	Retention Value	Age	NRZ	SRZ	NRZ encroachment (%)	SRZ encroached	Impact	Neighbouring/street tree	Tree Outcome	Comment
92	Corymbia maculata	1	12	5	220	250	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	2.64	1.85	100	Yes	High Impact: >20%		Retention-incompatible	
93	Corymbia maculata	1	12	4	240	280	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	2.88	1.94	100	Yes	High Impact: >20%		Retention-incompatible	
94	Corymbia maculata	1	12	4	210	260	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	2.52	1.88	72	Yes	High Impact: >20%		Retention-incompatible	Sparse canopy
95	Corymbia maculata	1	14	5	330	380	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	3.96	2.20	100	Yes	High Impact: >20%		Retention-incompatible	
96	Corymbia maculata	1	10	5	270	320	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.24	2.05	100	Yes	High Impact: >20%		Retention-incompatible	
97	Corymbia maculata	1	14	6	350	400	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.25	100	Yes	High Impact: >20%		Retention-incompatible	
98	Corymbia maculata	1	11	7	300	330	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.6	2.08	100	Yes	High Impact: >20%		Retention-incompatible	
99	Corymbia maculata	1	13	6	280	320	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.36	2.05	100	Yes	High Impact: >20%		Retention-incompatible	
100	Corymbia maculata	1	11	4	190	220	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	2.28	1.75	100	Yes	High Impact: >20%		Retention-incompatible	
101	Corymbia maculata	1	11	4	240	270	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	2.88	1.91	100	Yes	High Impact: >20%		Retention-incompatible	
102	Corymbia maculata	1	11	5	220	280	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	2.64	1.94	100	Yes	High Impact: >20%		Retention-incompatible	
103	Corymbia maculata	1	13	5	300	280	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.6	1.94	80	Yes	High Impact: >20%		Retention-incompatible	
104	Corymbia maculata	1	7	2	100	130	Poor	Fair	Short (5-15 years)	Low	Low	Semi-mature	2	1.50	100	Yes	High Impact: >20%		Retention-incompatible	Sparse canopy
105	Corymbia maculata	1	13	6	280	340	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.36	2.10	100	Yes	High Impact: >20%		Retention-incompatible	
106	Corymbia maculata	1	13	6	310	340	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.72	2.10	100	Yes	High Impact: >20%		Retention-incompatible	
107	Corymbia maculata	1	10	6	180	210	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	2.16	1.72	100	Yes	High Impact: >20%		Retention-incompatible	
108	Corymbia maculata	1	10	6	250	300	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3	2.00	100	Yes	High Impact: >20%		Retention-incompatible	
109	Corymbia maculata	1	7	2	140	150	Fair	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	100	Yes	High Impact: >20%		Retention-incompatible	Sparse canopy

Tree ID	Botanical name	Trees in group	Height (m)	Spread (m)	DSH (mm)	DAB (mm)	Health	Structure	ULE	Landscape Significance	Retention Value	Age	NRZ	SRZ	NRZ encroachment (%)	SRZ encroached	Impact	Neighbouring/street tree	Tree Outcome	Comment
110	<i>Corymbia maculata</i>	1	6	6	260	300	Poor	Fair	Short (5-15 years)	Low	Low	Over-mature	3.12	2.00	100	Yes	High Impact: >20%		Retention-incompatible	Tree is nearly dead
111	<i>Corymbia maculata</i>	1	11	5	230	250	Fair	Good	Medium (15-40 years)	Medium	Low	Mature	2.76	1.85	50	Yes	High Impact: >20%		Retention-incompatible	
112	<i>Corymbia maculata</i>	1	14	8	370	420	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	4.44	2.30	0		No Impact: 0%		Retention-compatible	
113	<i>Corymbia maculata</i>	1	14	8	310	350	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	3.72	2.13	20	Yes	Moderate Impact: 10-20%		Retention-compatible subject to mitigation measures	
113a	<i>Corymbia maculata</i>	1	10	8	350	380	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.20	100	Yes	High Impact: >20%		Retention-incompatible	
114	<i>Callistemon salignus</i>	1	10	5	350	420	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.30	12		Moderate Impact: 10-20%	Neighbouring tree	Retention-compatible subject to mitigation measures	DBH and DAB estimated at base . Multi stemmed . Tree is situated on adjacent property, not tagged
115	<i>Callistemon salignus</i>	1	10	6	600	600	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	7.2	2.67	19		Moderate Impact: 10-20%	Neighbouring tree	Retention-compatible subject to mitigation measures	Multi stemmed. DBH and DAB estimated at base .Tree is situated on adjacent property, not tagged
116	<i>Casuarina glauca</i>	1	12	6	350	400	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.25	10		Moderate Impact: 10-20%	Neighbouring tree	Retention-compatible subject to mitigation measures	Tree is situated on adjacent property, not tagged
117	<i>Allocasuarina torulosa</i>	1	8	6	350	400	Fair	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.25	5		Low Impact: <10%	Neighbouring tree	Retention-compatible	Tree is situated on adjacent property, not tagged
118	<i>Callistemon viminalis</i>	1	7	6	300	300	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	3.6	2.00	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Multi stemmed. DBH and DAB estimated at base .Tree is situated on adjacent property, not tagged
119	<i>Callistemon viminalis</i>	1	7	6	300	300	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	3.6	2.00	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Multi stemmed. DBH and DAB estimated at base .Tree is situated on adjacent property, not tagged
120	<i>Syzygium paniculatum</i>	1	6	5	120	150	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Tree is situated on adjacent property, not tagged
121	<i>Casuarina glauca</i>	1	13	5	180	200	Good	Good	Medium (15-40 years)	Medium	Low	Semi-mature	2.16	1.68	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Tree is situated on adjacent property, not tagged
122	<i>Casuarina glauca</i>	1	14	10	350	400	Good	Good	Medium (15-40 years)	Medium	Medium	Mature	4.2	2.25	3		Low Impact: <10%	Neighbouring tree	Retention-compatible	Tree is situated on adjacent property, not tagged
123	<i>Casuarina glauca</i>	1	12	4	120	140	Good	Good	Medium (15-40 years)	Medium	Low	Semi-mature	2	1.50	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Tree is situated on adjacent property, not tagged
124	<i>Syzygium paniculatum</i>	1	7	5	140	150	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. Tree is situated on adjacent property, not tagged
125	<i>Syzygium paniculatum</i>	1	7	5	200	200	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2.4	1.68	0		No Impact: 0%	Neighbouring tree	Retention-compatible	DBH and DAB estimated at base . Multi stems. Tree is

Tree ID	Botanical name	Trees in group	Height (m)	Spread (m)	DSH (mm)	DAB (mm)	Health	Structure	ULE	Landscape Significance	Retention Value	Age	NRZ	SRZ	NRZ encroachment (%)	SRZ encroached	Impact	Neighbouring/street tree	Tree Outcome	Comment
																				situated on adjacent property, not tagged
126	<i>Syzygium paniculatum</i>	1	7	4	120	140	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. Tree is situated on adjacent property, not tagged
127	<i>Syzygium paniculatum</i>	1	7	5	200	200	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2.4	1.68	0		No Impact: 0%	Neighbouring tree	Retention-compatible	DBH and DAB estimated at base . Multi stems. Tree is situated on adjacent property, not tagged
128	<i>Syzygium paniculatum</i>	1	8	5	220	250	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2.64	1.85	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. DBH and DAB estimated at base . Multi stems. Tree is situated on adjacent property, not tagged
129	Dead tree	1	8	5	180	200	Poor	Poor	Remove (<5 years)	Low	Low	Over-mature	2.16	1.68	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Tree is dead. It is situated on adjacent property and not tagged
130	<i>Syzygium paniculatum</i>	1	8	5	150	200	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.68	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. DBH and DAB estimated at base . Multi stems. Tree is situated on adjacent property, not tagged
131	<i>Syzygium paniculatum</i>	1	8	5	150	200	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.68	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. DBH and DAB estimated at base . Multi stems. Tree is situated on adjacent property, not tagged
132	<i>Syzygium paniculatum</i>	1	7	4	120	150	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. DBH and DAB estimated at base . Multi stems. Tree is situated on adjacent property, not tagged
133	<i>Syzygium paniculatum</i>	1	8	5	150	150	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.50	0		No Impact: 0%	Neighbouring tree	Retention-compatible	Twin stems. DBH and DAB estimated at base . Multi stems. Tree is situated on adjacent property, not tagged
134	<i>Syzygium paniculatum</i>	1	8	5	140	200	Good	Good	Medium (15-40 years)	Low	Low	Semi-mature	2	1.68	66	Yes	High Impact: >20%	Neighbouring tree	Retention-compatible subject to mitigation measures	Tree on adjacent property, not tagged
135	<i>Eucalyptus sp.</i>	1	10	7	280	320	Fair	Fair	Medium (15-40 years)	Medium	Medium	Mature	3.36	2.05	0		No Impact: 0%	Street tree	Retention-compatible	Tree on council verge, not tagged.

Appendix F Tree protection guidelines

The following tree protection guidelines must be implemented during the construction period if no tree-specific recommendations are detailed.

F1: 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 4970-2025, *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).
- Cyclone chain wire link fence or similar, with lockable access gates.
- Certified and Inspected by the Project Arborist.
- Installed prior to any machinery or material are brought to site and before the commencement of works.
- Prominently sign posted with 300 mm x 450 mm boards stating, "NO ACCESS - TREE PROTECTION ZONE".

F2: 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.

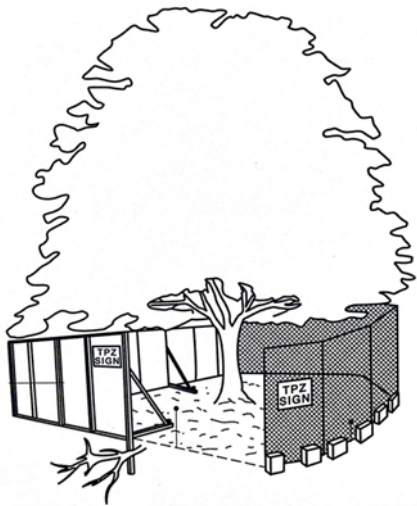
F3: Trunk protection

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

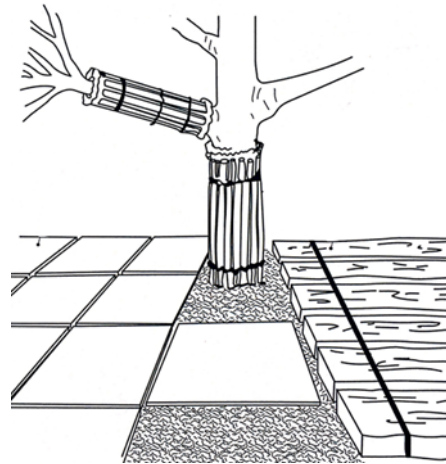
The removal of bark or branches allows the potential ingress of micro-organisms which may cause decay. Furthermore, the removal of bark restricts the trees' ability to distribute water, mineral ions (solutes), and glucose.

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. The timbers shall be wrapped around the trunk but not fixed to the tree, as this will cause injury/damage to the tree.



Tree protection fencing



Trunk protection fencing

F4: 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. Maintain a thick layer of mulch around all retained trees to a depth of 100 mm using coarse pine bark or wood chip material that complies with AS 4454. Where the existing landscape within the TPZ is to remain unaltered (e.g. garden beds or turf) mulch may not be required.

For heavy vehicle access within TPZ, ground protection may include a permeable membrane such as geotextile fabric beneath a layer of 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.

F5: Root protection and investigation

If incursions/excavation within the TPZ are unavoidable, root investigation may be needed to determine the extent and location of roots within the area of construction activity. The location and distribution of roots are found through non-destructive excavation (NDE) methods such as hydro-

vacuum excavation (sucker truck), air spade and manual excavation. Root investigation does not guarantee the retention of the tree.

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.

All root pruning shall be undertaken by a minimum AQF Level 3 Consulting Arborist, in compliance with Australian Standard *AS 4373-2007 Pruning of Amenity Trees* and Safe Work Australia's '*Guide to Managing Risks of Tree Trimming and Removal Work*'.

F6: 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), non-destructive excavation (NDE) methods such as hydro-vacuum, Air Spade or manually excavated trenches. The horizontal drilling/boring must be at minimum depth of 600 mm below grade. Trenching for services is to be regarded as "excavation". The Project Arborist should assess the likely impacts of any boring and bore pits on retained trees.

