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New High School in Bungendore: Arboricultural Impact Assessment

School Infrastructure NSW

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Template 2.8.1

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Abbreviations

Abbreviation	Description
AQF	Australian Qualifications Framework
AS	Australian Standards
DBH	Diameter at Breast Height
ELA	Eco Logical Australia
m	Metre
mm	Millimetre
NDE	Non-Destructive Excavation
NO	Number
NSW	New South Wales
SP	Species
SRZ	Structural Root Zone
TPZ	Tree Protection Zone
VTA	Visual Tree Assessment

1. Introduction

1.1 Background

Eco Logical Australia Pty Ltd (ELA) prepared an Arboricultural Impact Assessment (AIA) that forms part of the Environmental Impact Statement for SSD No 14394209 for a new high school at Bungendore. The Environmental Impact Statement was exhibited by the NSW Department of Planning from Monday 20 September 2021 to Monday 18 October 2021. During the exhibition submissions were received and following exhibition the Department of Planning and Environment issued two requests for information dated 16 November 2021 and 24 December 2021.

This AIA accompanies an Amendment Report for the project and forms an update to the previously issued version 5 AIA dated 8 September 2021.

This report addresses the Secretary's Environmental Assessment Requirements (SEARs), notably as follows in Table 1:

Table 1: SEARs

SEARs requirements	Response
3. Trees and Landscaping <ul style="list-style-type: none"> where relevant, an arboricultural impact assessment prepared by a Level 5 (Australian Qualifications Framework) Arborist, which details the number, location and condition of trees to be removed and retained, includes detailed justification for each tree to be removed and details the existing canopy coverage on-site. 	An AQF Level 5 Consulting Arborist has assessed each tree.

1.2 Amended proposal

- The amended design no longer includes facilities for Queanbeyan-Palerang Regional Council (Council) such as the previously proposed community health centre, community library and council shop front. The facilities are still to be provided by Council, however, through a separate planning process and on a separate site.
- Administration and staff facilities have been relocated from Block A into Block C (existing council building) and the visual arts and TAS functions have been relocated into Block A.
- The school library has been relocated from Block D to a standalone block, Block E, which is located to east of the Majara Street alignment and centred on the school common.
- Block D has been replanned to address the removal of Council facilities, the relocation of the school library and to sit to the east of the Majara Street alignment. The floor level of Block D has also been lowered to suit the revised building footprint.
- Block B has been relocated to the west, off the Majara Street alignment.
- The games courts and cricket batting nets have been relocated within the school boundary.
- The bulk and scale of buildings facing public roads (Blocks A and B) have been reduced.
- The façade materials of the proposed buildings have been revised to be more sympathetic to the existing village character.
- The primary outdoor learning areas, including the 'covered' outdoor learning areas have been relocated and redesigned to be integrated within the landscape design.

- Minor planning changes to Block B which include relocation of the outdoor learning spaces, student amenities and building services to provide a new covered walk through from the school plaza to Mick Sherd Oval.
- The covered walkway connection between Block B and Block D has been redesigned to arc around the eastern side of the school common and provide a covered connection to the relocated school library, Block E.
- The school security fence between Blocks B and D has been redesigned to arc around the western perimeter of the school common. The school security fence to the northern and southern boundaries has been rationalised and face brickwork piers have been introduced to define the school entries.
- The waste vehicle turning circle has been removed from the proposal. The waste collection area has been relocated to the southern end of the existing carpark and a waste vehicle turning head has been added. A new turning bay is provided for assisted transport vehicles to the northern end of the car park.
- The onsite detention tank has shifted to the west.
- The electronic school sign has been replaced with a changeable, static 'notice board' sign. The sign has been relocated further back from Majara Street, behind the school security fence.
- The Scout storage shed has been relocated from the agricultural plot to within the Scout site. The Scout storage shed will be subject to a separate planning pathway and does not form part of this application. The school agricultural support building, Block F, has been repositioned and the landscape paths and driveways have been updated to suit the change.
- An addition 58 car parking spaces are proposed along Turallo Terrace providing a total of 98 spaces (compared to the original 35). An additional 3 drop off/ pickup spaces are proposed on Turallo Terrace providing a total of 6 spaces (compared with the original 3).
- The proposed delineation works to Mick Sherd Oval and the War Memorial have been removed from the proposal.
- The redesign of pedestrian crossings on Gibraltar Street and Turallo Terrace from 'School Crossings' to 'Wombat Crossings'.
- A footpath is proposed to the northern side of Turallo Terrace connecting the proposed parking with the existing path adjacent to Turallo Creek.

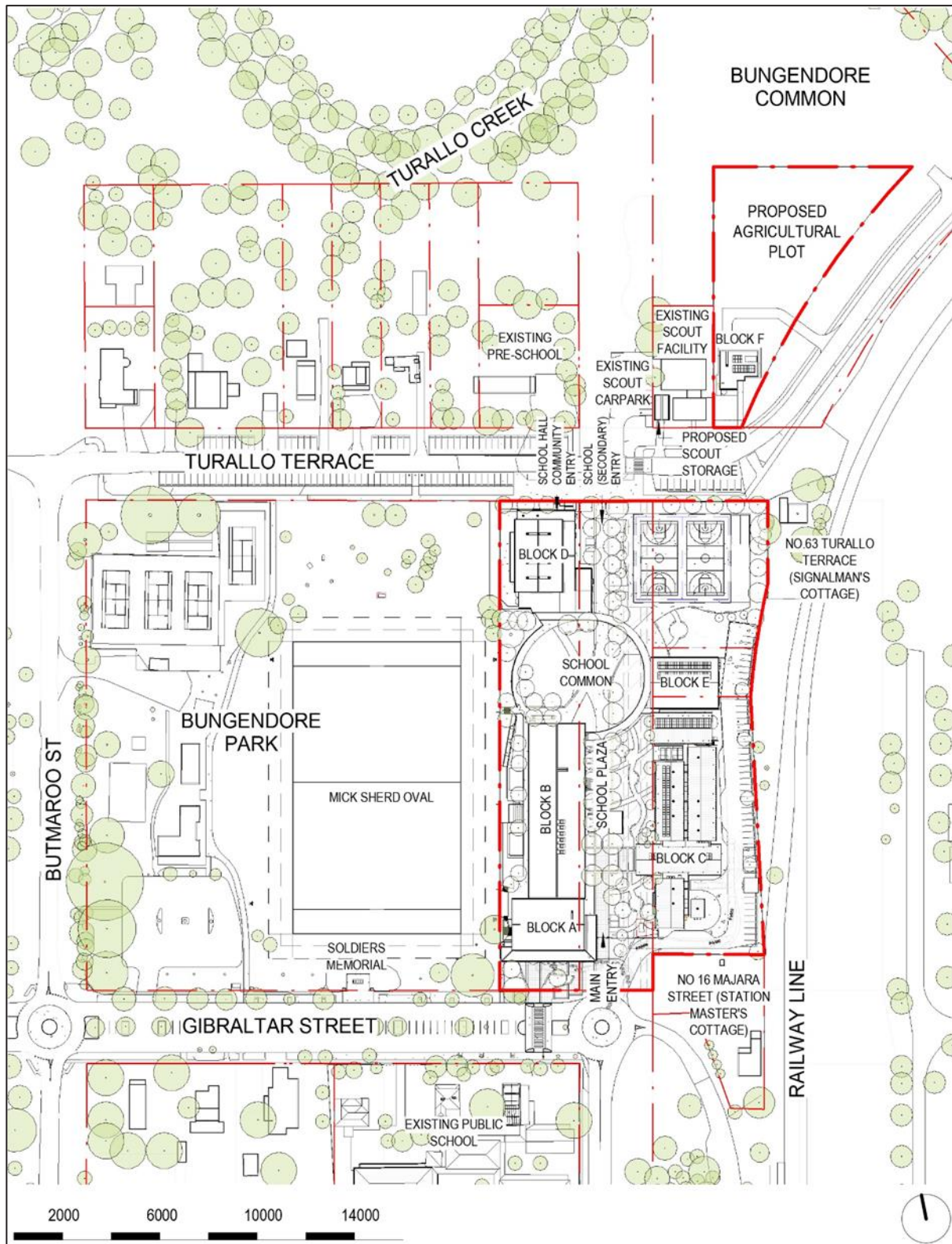


Figure 1: Proposed site plan (Source: TKD Architects)

1.3 Site description

The proposed development is located within the Bungendore Town Centre within the local government area of Queanbeyan-Palerang Regional Council. The proposal involves the use of land bounded by Bungendore Park, Gibraltar Street, Majara Street, Turallo Terrace and Butmaroo Street, the existing former Palerang Council site at 10 Majara Street, the Majara Street Road reserve bounded by Turallo Terrace and Gibraltar Streets and Nos. 2, 4 and 6 Majara Street (Refer to Table 1 below).

The site is legally described as per the existing Lots and DPs in Table 1 below. The school site comprises land which has recently been transferred to the ownership of the Department of Education, being Lots 12-14 of DP1139067, Lot 3 of DP830878, part of Lot 701 of DP1027107, the part of lot 701 of DP96240, and part of the Majara Street Road Reserve. The proposed Lots and DPs are detailed within Table 1 below and are not yet registered at the time of writing of this Amendment Report.

The site is approximately 25,350m² in area and consists of a relatively flat topography. It contains existing Council buildings. The land is mostly cleared of vegetation with some mature trees intersperse throughout subject lots.

The surrounding area generally includes low density residential developments to the north and west, an existing rail line to the east and Bungendore Public School and the Bungendore train station to the south and south west respectively.

Table 2: New high school in Bungendore legal descriptions

Property Address	Lot/DP	Area (m ²)
6-14 Butmaroo Street	Part Lot 701 DP 1027107	11 700 m ²
2 Majara Street	Lot 12 DP 113967	1 903 m ²
4-6 Majara Street	Lot 13 and 14 DP 1139067	1 724 m ²
10 Majara Street	Lot 3 DP 830878	4 571 m ²
Butmaroo Street	Part of Lot 701 DP 96240	Approx. 4 500 m ²
Portion of Majara Street between Turallo Terrace and Gibraltar Street	N/A	N/A

1.4 Purpose and aims

The report has been prepared in accordance with the Australian Standards *AS 4970–2009 Protection of trees on development sites*.

The purpose of this report is to:

- Address SEARs requirement 3 outlined in Table 1
- identify the trees within the site that are likely to be affected by the proposed works
- undertake a visual tree assessment of the subject trees
- assess the current overall health and condition of the subject trees
- evaluate the retention value of the subject trees
- identify trees to be removed, retained or transplanted

- determine the likely impacts on trees to be retained
- recommend tree protection measures to minimise adverse impacts and for amendments to the design or construction methodology where necessary to minimise any adverse impact.



Figure 2: Site aerial depicting the land subject to the proposed High School (Source: TKD Architects)

A summary of the proposed activity is outlined in Table 3 and is based on information available at the time of preparing this report. Results of mapping and field investigations reflect changes in the proposed development footprint during this study.

Table 3: Proposed activity

Activities that can impact trees	Description of proposed activities
Clearing vegetation	Yes, a total of 90 trees are proposed to be cleared
Mitigation measures	<p>Impacts for 15 trees (Trees 404 to 418) have been determined from client consultation and therefore, prior to construction. Of these, five trees (Trees 406, 407, 408, 409 and 416) are identified as “potential to be retained” are subject to further consultation with the Project Arborist.</p> <p>During the detailed design phase the Project Arborist is also to be consulted to aid in determining an appropriate construction method for the 11 trees (Trees 172, 212A, 212B, 212C, 225B, 227, 406, 407, 408, 409 and 416) marked as ‘potential to be retained.’</p>
Pruning vegetation	No
Earthworks including regrading, excavation and trenching <ul style="list-style-type: none"> For building For services 	Yes, as outlined in section 1.2
Compaction	Yes, all compaction, material storage, installation of structures, stockpiling, onsite parking and vehicle access is to be outside of trees to be retained.
Refuelling and chemical use (e.g. herbicides)	Yes
Erection of scaffolding	Yes
Vehicle movements	Yes
Changes to stormwater management	No
Landscaping	Yes, the proposed landscaping will comprise new game courts, campus paving, concrete stairs and seating, paved pedestrian pathways, shade structures, turf embankments and a carpark.

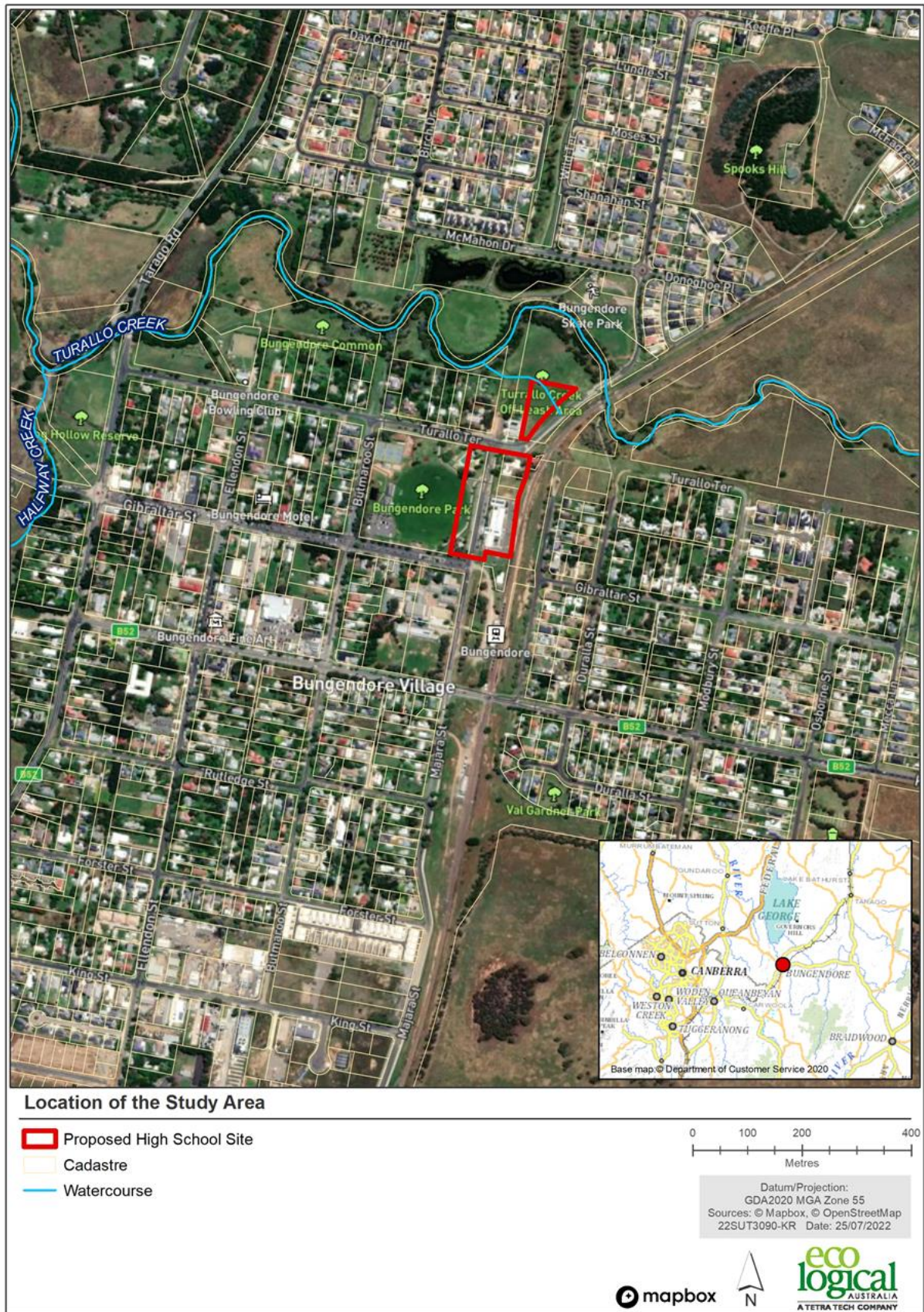


Figure 3: Proposed High School site location

2. Method

2.1 Definition of a tree

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

The Queanbeyan-Palerang Regional Council Development Control Plan (2012) defines a tree dependant on which land zone the tree is located in. Subject trees were located within land zones RE1 (public Recreation), SP2 (Special Use) and R2 (Rural Landscaping). These land zones define a tree as:

'both native and exotic having a height of 6 m or greater; or a canopy spread of 3 m or greater' (Queanbeyan-Palerang Regional Council 2012).

2.2 Visual tree assessment

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

A total of 165 subject trees were inspected in July 2020 by AQF Level 5 Consulting Arborist, Jessica Lawn. An additional three trees (Trees 401, 402 and 403) were verified on site via virtual inspection with Nick Valois on 7 July 2022. An additional 15 trees (Trees 404 to 418) were included via desktop assessment in 2022 making the total tree count **183 trees**.

The following limitations apply to this methodology:

- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and testing.
- Trees were inspected within limits of site access.
- The locations of the subject trees were recorded using hand-held GPS units. Therefore, tree locations were moved using GIS map techniques to the Project Surveyors locations (2021) where possible or to NearMap satellite imagery (2017) as outlined in Appendix C.
- Tree 212 (group of 10 mix native spp.) in version 5 of ELAs AIA report (dated 8 September 2021) did not all met the definition of a tree therefore, the group has been separated out as five individual trees (Trees 212.1, 212.2, 212.3, 212.4 and 212.5) and adjusted to match survey locations (Project Surveyors 2021).
- Tree 214 (group of 10 mix native spp.) in version 5 of ELAs AIA report dated 8 September 2021) did not all met the definition of a tree therefore, the group has been separated out as four individual trees (Trees 214.1, 214.2, 214.3 and 214.5) and adjusted to match survey locations (Project Surveyors 2021).
- Tree 225 (group of 5) in version 5 of ELAs AIA report (dated 8 September 2021) has been split out to match survey locations (Project Surveyors 2021) as are now five individual trees (Trees 225.1, 225.2, 225.3, 225.4 and 225.5).
- Trees 404 to 418 have not been assessed on site (see Figure 7, Appendix C). Tree points have been added for these trees based on NearMap aerial imagery (2017) and topographical survey. Impacts for these trees have been determined based on client discussion and review of the

design. The level of encroachment (major or minor) was estimated as the DBH/DAB of these trees was not recorded and therefore the percent encroachment was not calculated. Where a major encroachment was estimated, these trees were identified as subject to “high impact” (to be removed). Where a minor encroachment was estimated, these trees were identified as “medium impact” (with potential to be retained), with further investigation by the project arborist required prior to construction to confirm the viability of these trees for retention.

- Following consultation with the landscape architects (CONTEXT) the proposed actions for 17 trees were reassessed to match the detailed landscaping plans. An additional 16 trees were identified for removal that were identified as to be retained or potential to be retained by ELA. These trees to be removed as per CONTEXT’s detailed landscape design are: 143A, 153, 161, 210, 211, 212D, 212E, 213, 214D, 215, 216, 219, 223, 225A, 225C and 226. One tree that was previously identified to be removed by ELA (Tree 406) was identified by CONTEXT to be retained. The proposed action for Tree 406 has been updated from removed to “potential to be retained”.
- No aerial inspections or root mapping was undertaken.
- Tree heights, canopy spread and diameter at breast height (DBH) were estimated, unless otherwise stated.
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.

2.3 Tree health and condition

Tree health and condition evaluation is based on knowledge and experience in the field in addition to section 2.3.2 Preliminary Tree Assessment from the *AS 4970 2009 Protection of trees on development sites* and other commonly used assessment methods which can be found in Appendix E of the Australian Standard including Arboriculture: integrated management of landscape trees, shrubs, and vines (Harris 1999) and Institute of Australian Consulting Arboriculturists (IACA) Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting (IACA 2010).

The criteria to determine tree health is based on numerous characteristics including:

- Live Crown Ratio
- Foliage Colour & density %
- Annual shoot growth/Dieback
- Wound wood development
- Vigour class
- Pests and diseases
- Growth obstructions
- Site Conditions
- Tree root defects including root rot, exposed roots, girdling, restricted root area
- Crown defects including poor taper, codominant stems, multiple attachments, included bark, excessive end weight (Lions tail), cracks, splits, hangers, wounds, decay, cavities, fungi present, kino - sap flow, loose or cracked bark, deadwood, borers, cankers galls and burls and previous failures and injuries.

2.4 Retention value

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

- **High - priority for retention.** These trees are considered important and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by Australian Standard AS 4970–2009 *Protection of trees on development sites*.
- **Medium - consider for retention.** These trees are moderately important for retention. Their removal should only be considered if adversely affected by the proposed works and all other alternatives have been considered and exhausted.
- **Low - consider for removal.** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- **Priority for removal:** These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

2.5 Protection zones

2.5.1 Tree protection zone (TPZ)

The TPZ is a specific area above and below ground and at a distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by the development. The radius of the TPZ is calculated for each tree by multiplying its DBH (trunk diameter measures at 1.4 m above ground) x 12. The radius is measured from the centre of the stem at ground level.

The TPZ (as defined by AS 4970-2009) requires restriction of access during the development process. Groups of trees with overlapping TPZs may be included within a single protection area. Tree sensitive measures must be implemented if works are to proceed within the TPZ.

2.5.2 Structural root zone (SRZ)

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

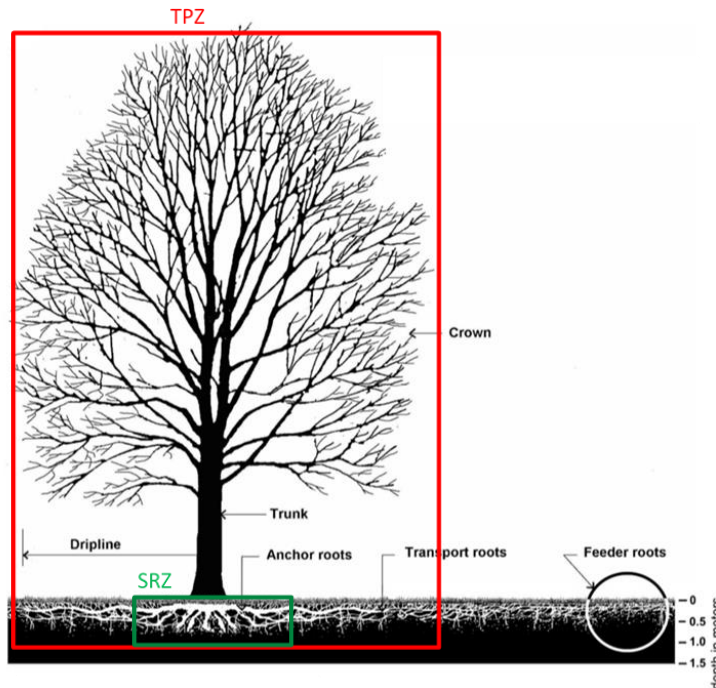


Figure 4: Representative tree structure and indicative TPZ and SRZ

2.6 Potential impacts

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

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

- **Minor encroachment** – If the proposed encroachment is less than 10% of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

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

- **High impact:** The SRZ is directly affected or the proposed encroachment is greater than 20% of the TPZ. Trees may not remain viable if they are subject to high impact. These trees cannot be retained unless the proposal is changed.
- **Medium impact:** If the proposed encroachment is greater than 10% of the TPZ (but less than 20% of the TPZ) and outside of the SRZ, the project arborist may require detailed root investigation to demonstrate that the tree(s) would remain viable. These trees may be retained subject to further investigation and mitigation measures.
- **Low impact:** If the proposed encroachment is less than 10% (total area) of the TPZ, and outside of the SRZ, detailed root investigations should not be required. These trees can be retained.
- **No impact:** No likely or foreseeable encroachment within the TPZ. These trees can be retained.

Impacts are calculated using geographic information systems techniques.

2.7 Proposed action

The proposed actions to either retain or remove each tree are determined by the impact from the proposed design footprint, conversations of intent with the client and corresponding mitigation measures. The following are the definition of these actions:

- **Remove:** Trees that are to be impacted by the proposed development to the extent whereby retention is not suitable and / or incompatible if the current plans are approved. All tree removal must comply with guidelines specified in section 4 of this report and subject to regulatory approval.
- **Retain:** Trees that are to be subject to minor encroachment (low or no impact) from the proposed works therefore retention is suitable under the Australian Standards (4970-2009).
- **Potential to be retained:** The project arborist will need to confirm the viability of tree retention depending on proposed construction methods.

3. Results and discussion

Results of the arboricultural assessment are summarised in Table 5. Detailed results are included in Appendices C and D. Site photos are provided in Appendix F and the site plan is in Appendix G.

Table 4: Summary of tree retention values and proposed action

	Proposed to be retained 82 Trees			Potential to Retain* 11 Trees			Proposed to be removed 90 Trees			
Retention Value	High	Medium	Low	High	Medium	NA^	High	Medium	Low	NA^
High Impact: >20%	-	-	-	1	5	-	7	43	30	10
Medium Impact: >10%	-	-	-	-	-	5	-	-	-	-
Low Impact: <10%	6	9	3	-	-	-	-	-	-	-
No Impact: 0%	6	46	12	-	-	-	-	-	-	-
Total	12	55	15	1	5	5	7	43	30	10

*RETENTION SUBJECT TO CONSULTATION WITH ARBORIST

^RETENTION VALUE NOT ASSESSED

TREES PROPOSED TO BE REMOVED (HIGH IMPACT)

A total of **90 trees** are proposed to be removed. Of these, **82 trees** will be highly affected (>20 % TPZ encroachment and/or SRZ encroachment) by the proposed development and cannot be retained within the current design footprint. The remaining **eight trees** (Trees 102, 103, 104 and 130 – 134) are proposed to be removed due to the miscellaneous works outside the proposed High School area. Specific areas of impact are tabulated in Appendix D.

Impacts, tree IDs and retention values are as follows:

- **High Impact (>20 % TPZ encroachment and/or SRZ encroachment)**
 - **High retention: seven** high retention value trees (Trees 110, 119, 120, 137, 138, 171, and 174)
 - **Medium retention: 43** medium retention value trees (Trees 107, 108, 111, 112, 113, 114A, 114B, 114C, 115, 121, 122, 123, 125, 126, 127, 128, 130, 132, 143A, 153 to 158, 160, 168, 169, 173, 178, 212D, 212E, 214D, 216, 225A, 225C to 225E, 233, 235, 401, 402 and 403)
 - **Low retention: 30** low retention value trees (Trees 102-104, 109, 124, 129, 131, 133, 134, 136, 159, 161 to 167, 170, 210, 211, 213, 215, 219, 223, 226, 229, 234, 236 and 400)
 - **Not assessed: 10** unidentified trees (Trees 404, 405, 410 to 415, 417 and 418)

Any loss of trees should be offset with replacement planting in accordance with the relevant offset policy.

TREES PROPOSED TO BE RETAINED (LOW/NO IMPACT)

A total of **82 trees** are proposed to be retained. Of these, a total of **14 trees** will be subject to low impact (<10% TPZ encroachment) and **64 trees** will be subject to no impact (0% TPZ encroachment) from the proposed development.

Impact and tree retention values are as follows:

- **Low impact (<10% TPZ encroachment)**
 - **High retention value:** six high retention value trees (Trees 74, 100, 101, 118, 141 and 175)
 - **Medium retention value:** nine medium retention value trees (Trees 106, 114D, 116, 214B and 217 (group of 5))
 - **Low retention value:** three low retention value trees (Trees 218, 221, and 224)
- **No impact (0% TPZ encroachment)**
 - **High retention value:** six high retention value trees (Tree 139, 144, 149, 152, 181 and 183)
 - **Medium retention value:** 46 medium retention value trees (Trees 89 to 93, 96, 97, 98, 99A to 99K, 114E to 114H, 143B to 143H, 117, 142, 143B to 143H, 145 to 148, 150, 151, 179, 180, 214A, 214C, 220, 230, 231 and 232)
 - **Low retention value:** 12 low retention value trees (Trees 94, 95, 105, 140, 176, 177, 182, 222, 228, 290A, 290B and 291)

TREES WITH POTENTIAL TO BE RETAINED

A total of **11 trees** are proposed to be retained subject to mitigation measures and consultation with the Project Arborist and may require root mapping. Of these, **six trees** (Trees 172, 212A, 212B, 212C, 225B and 227) are currently subject to high impact (>20% TPZ encroachment and/or SRZ encroachment) and **five trees** (Trees 406, 407, 408, 409 and 416) not assessed that are located on the boundary of the development footprint are subject to medium impact (>10% and <20% TPZ encroachment) based on the proposed development footprint. It is recommended that mitigation measures and the construction methodology for the works in these locations be developed in consultation with the Project Arborist during the detailed design phase in order to determine whether tree retention is viable. Specific areas of impact are tabulated in Appendix D.

Impacts, tree IDs and retention values are as follows:

- **High impact (>20% TPZ encroachment and/or SRZ encroachment)**
 - **High retention:** one tree (Tree 172)
 - **Medium retention:** five trees (Trees 212A to 212C, 225B and 227)
- **Medium impact (>10% and <20% TPZ encroachment)**
 - **Not assessed:** five unidentified trees (Trees 406, 407, 408, 409 and 416)

The tree protection plan is outlined in section 4 of this report and tree protection guidelines are provided in Appendix E.

4. Tree protection plan

- 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).
- Permission must be granted from the relevant consent authority prior to removing or pruning of any of the subject trees. Approved tree works should not be carried out before the installation of tree protection measures.
- 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*.

Tree protection guidelines are summarised in Table 5 and further information is in Appendix E.

Table 5: Summary of tree protection measures

Type	More details	Comment
Signage	Appendix E1	Prominently sign posted with 300 mm x 450 mm boards stating, "NO ACCESS - TREE PROTECTION ZONE".
Tree protection fencing	Appendix E1	Protective cyclone chain wire link fence to be erected around the TPZ to protect and isolate retained trees from the construction works. Existing boundary fencing may be used. There is no specified distance as long as the whole TPZ is encompassed by the fencing.
Crown protection	Appendix E2	Where required, crown protection may include the installation of a physical barrier, pruning selected branches to establish clearance, or the tying/bracing of branches.
Trunk and branch protection	Appendix E3	When fencing is not practical or prior to any activities within the TPZ, trunk protection is required and consist of a layer geotextile fabric or similar followed by 1.8 m lengths of softwood timbers spaced evenly around the trunk and secured with a galvanised hoop strap.
Ground protection	Appendix E4	Install and maintain 100mm thick layer of mulch around tree in TPZ. For machine or vehicle access within TPZ geotextile fabric beneath crushed rock or rumble boards may be required.
Soil moisture		Soil moisture levels should be regularly monitored by the project arborist. Temporary irrigation or watering may be required within TPZ.
Root protection and investigation	Appendix E5	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 using non-destructive excavation (NDE) methods.
Underground services	Appendix E6	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.

5. Hold points, inspection and certification

An AQF Level 5 Consulting Arborist needs to be engaged to supervise work within the TPZ, provide advice regarding tree protection and monitor compliance. 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.

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.

Pre-construction

Detailed design:

Prior to construction the proposed impacts for five trees (Trees 406, 407, 408, 409 and 416) subject to further investigation in consultation with the Project Arborist.

During the detailed design phase the Project Arborist is also to be consulted to aid in determining an appropriate construction method for the **11 trees** (Trees 172, 212A, 212B, 212C, 225B, 227, 406, 407, 408, 409 and 416) marked as 'potential to be retained.' Mitigation measures such as root investigation may be required.

The tree protection plan is outlined in section 4 of this report and tree protection guidelines are provided in Appendix E.

Post Approval: An initial site meeting should be completed by the appointed Project Arborist with the site manager/engineer and construction personnel (who will be setting up the tree protection measures) prior to any commencement of works to discuss the tree protection measures required for the trees approved to be retained. Trees that are approved for removal should be indicated clearly on site with spray paint on trunks. All approvals for removal and retention are to be attained by the relevant consent authority prior to construction and tree removal is to be carried out by an experienced tree surgeon with a minimum qualification of AQF Level 3.

During construction

Monthly inspection of trees by the project arborist (or other timing as agreed with the project arborist). Where there is potential conflict between tree canopy and construction activities, notification is to be given prior to the commencement of work within the TPZ, with supervision by the project arborist of any work undertaken in this zone.

Post-construction

Final inspection of trees by project arborist after all major construction has ceased and following the removal of tree protection measures.

6. References

6.1 General references

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Standards Australia 2009. *Australian Standard: Protection of trees on development sites, AS 4970 (2009)*. Standards Australia, Sydney.

6.2 Project specific references

Context Landscape Architecture 2022. *New High School in Bungendore Existing Tree Plan*. Job no. 15562, dwg. no BHS_LA_DA_2004, revision 7 dated 26/7/2022

Project Surveyors 2021. *Detail Survey*. Job ref, B04901, dwg no. B04901-BUN-A, dated 3 May 2021, amended 1 April 2021

TKD Architects 2021. *Proposed Site Plan A3, New High School in Bungendore*. Sheet B1, Job no. 200096, dated 23 June 2022

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.

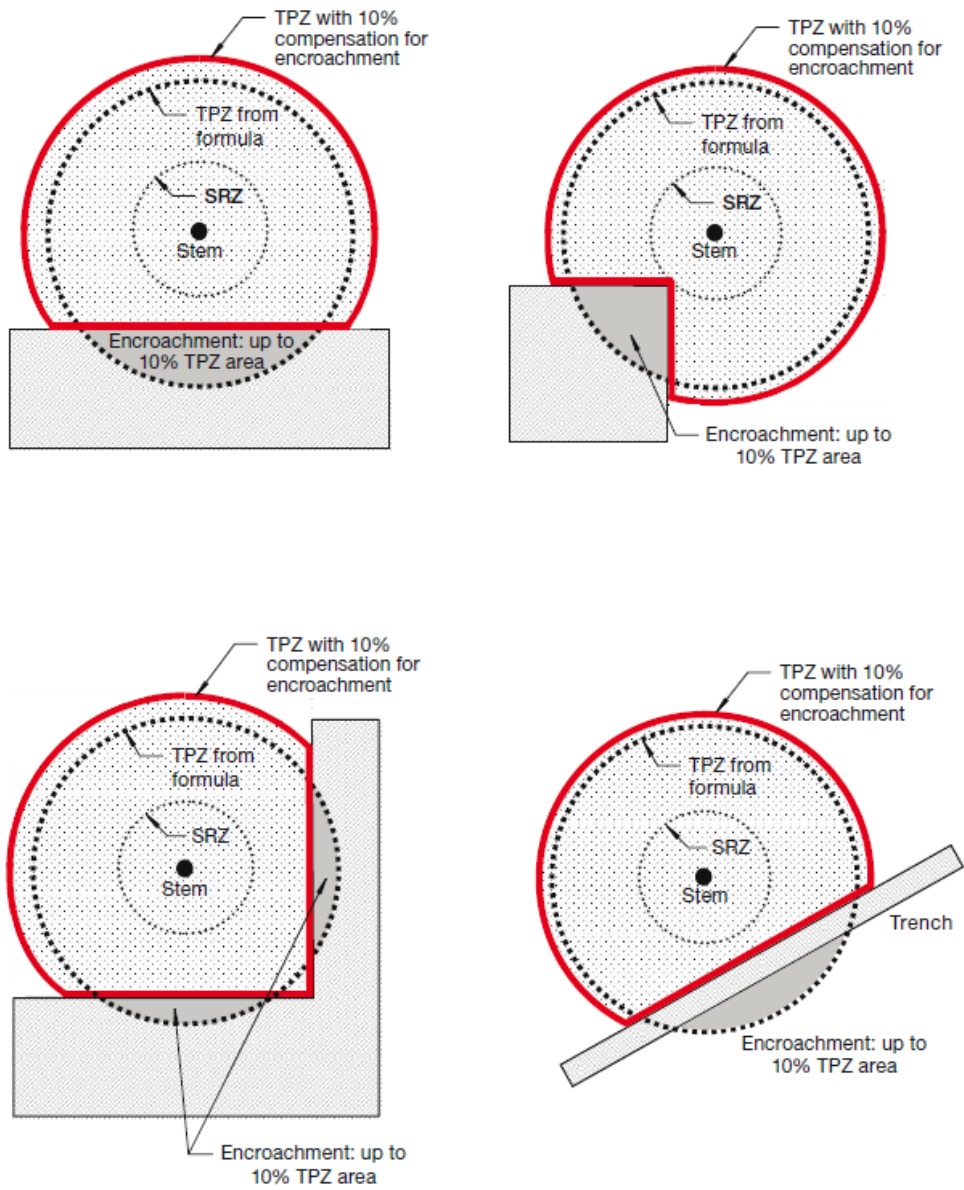
Low	Medium	High
<p>The tree is in fair-poor condition and good or low vigour.</p> <p>The tree has form atypical of the species</p> <p>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings</p> <p>The tree provides a minor contribution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

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					

	Priority for retention (High): Tree considered important so should be retained and protected. Design modification or re-location of structure should be considered to accommodate the setbacks as prescribed by the <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.
	Consider for retention (Medium): Tree considered less important; however, retention should remain priority. Removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for removal (Low): Tree not considered important for retention, nor requiring special works or design modification to be implemented for their retention.
	Priority for removal: 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 4970-2009



Appendix C Maps



Figure 5: Tree locations map

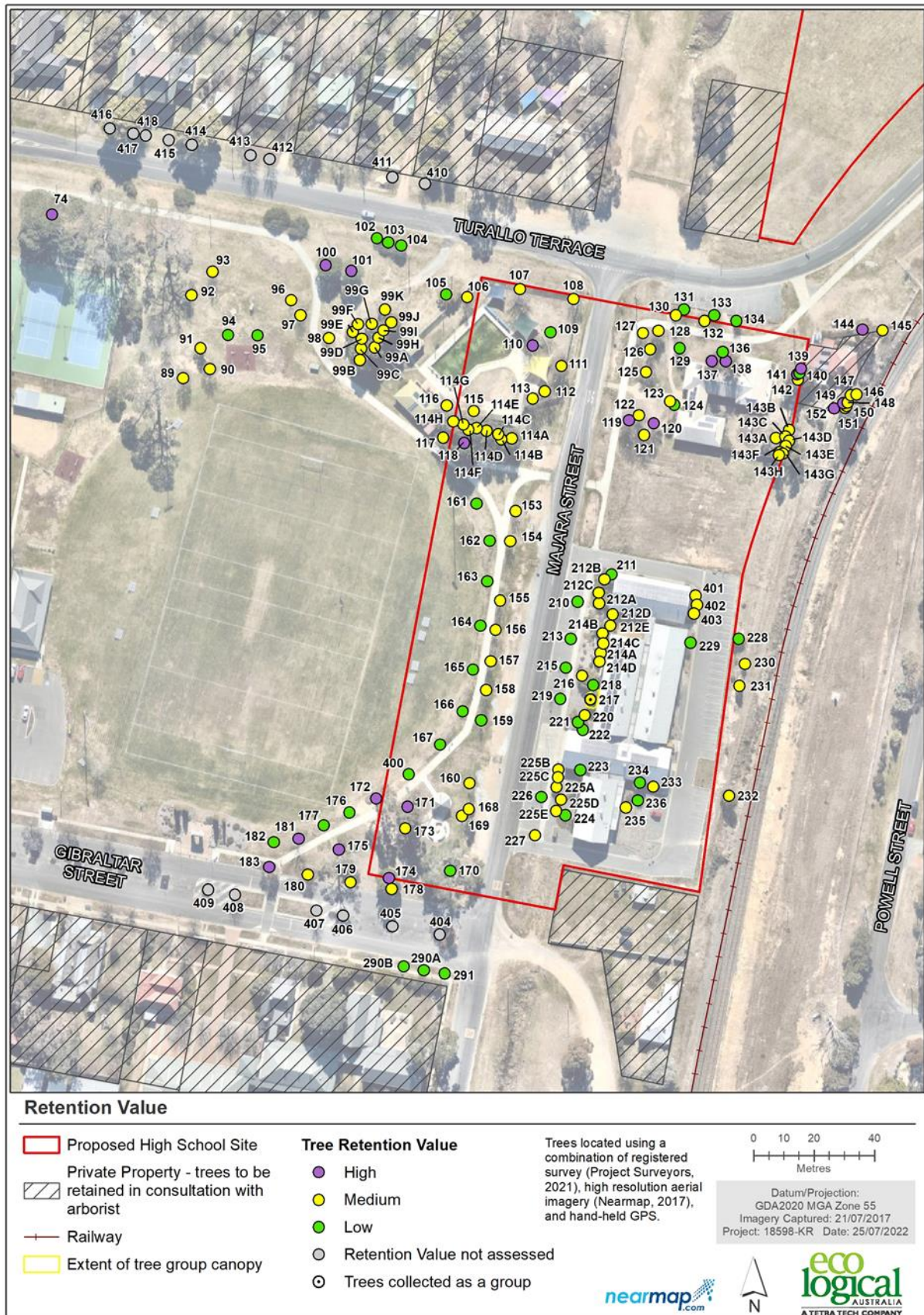


Figure 6: Tree retention values

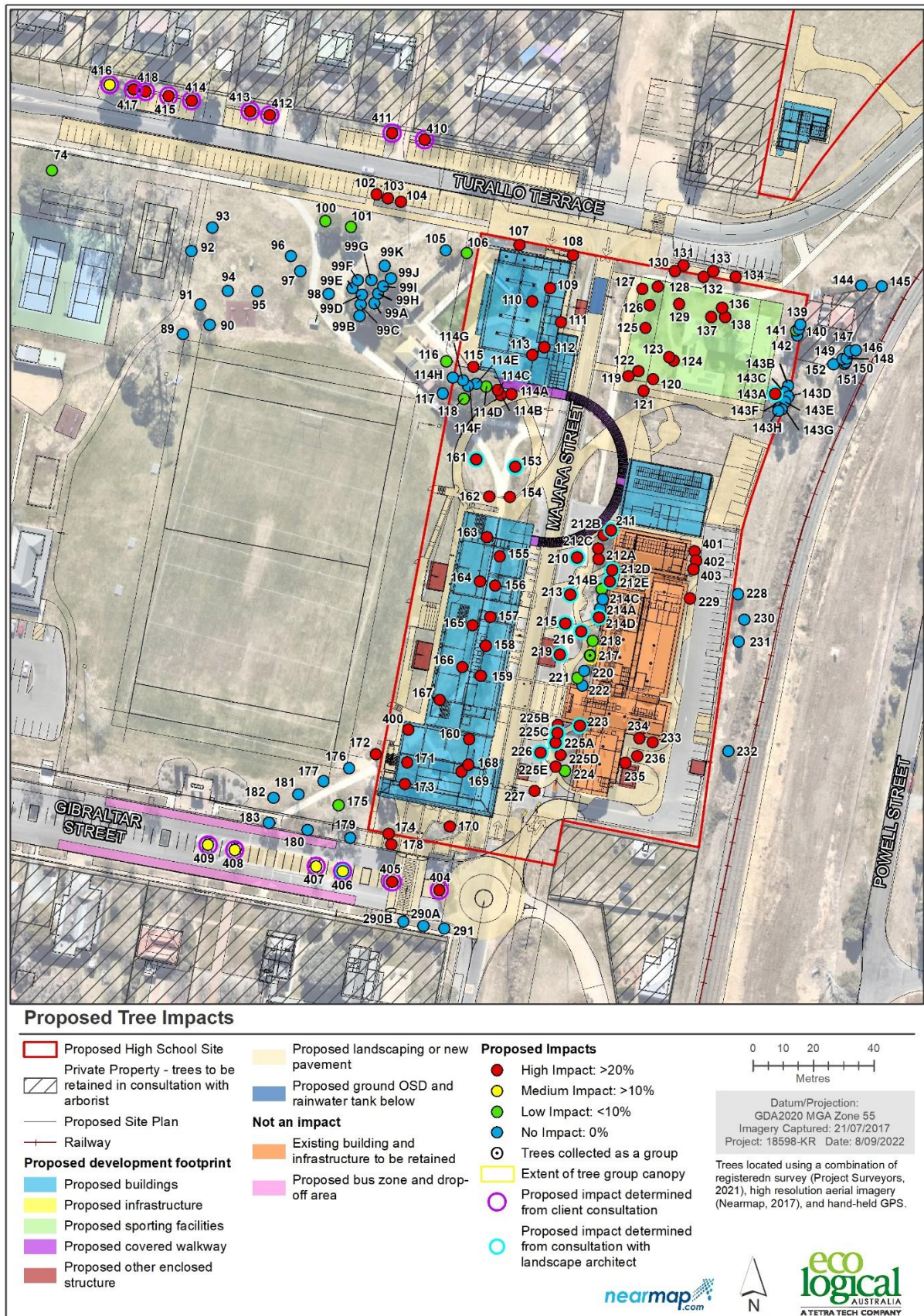


Figure 7: Arboricultural impact assessment



Figure 8: Tree canopy density

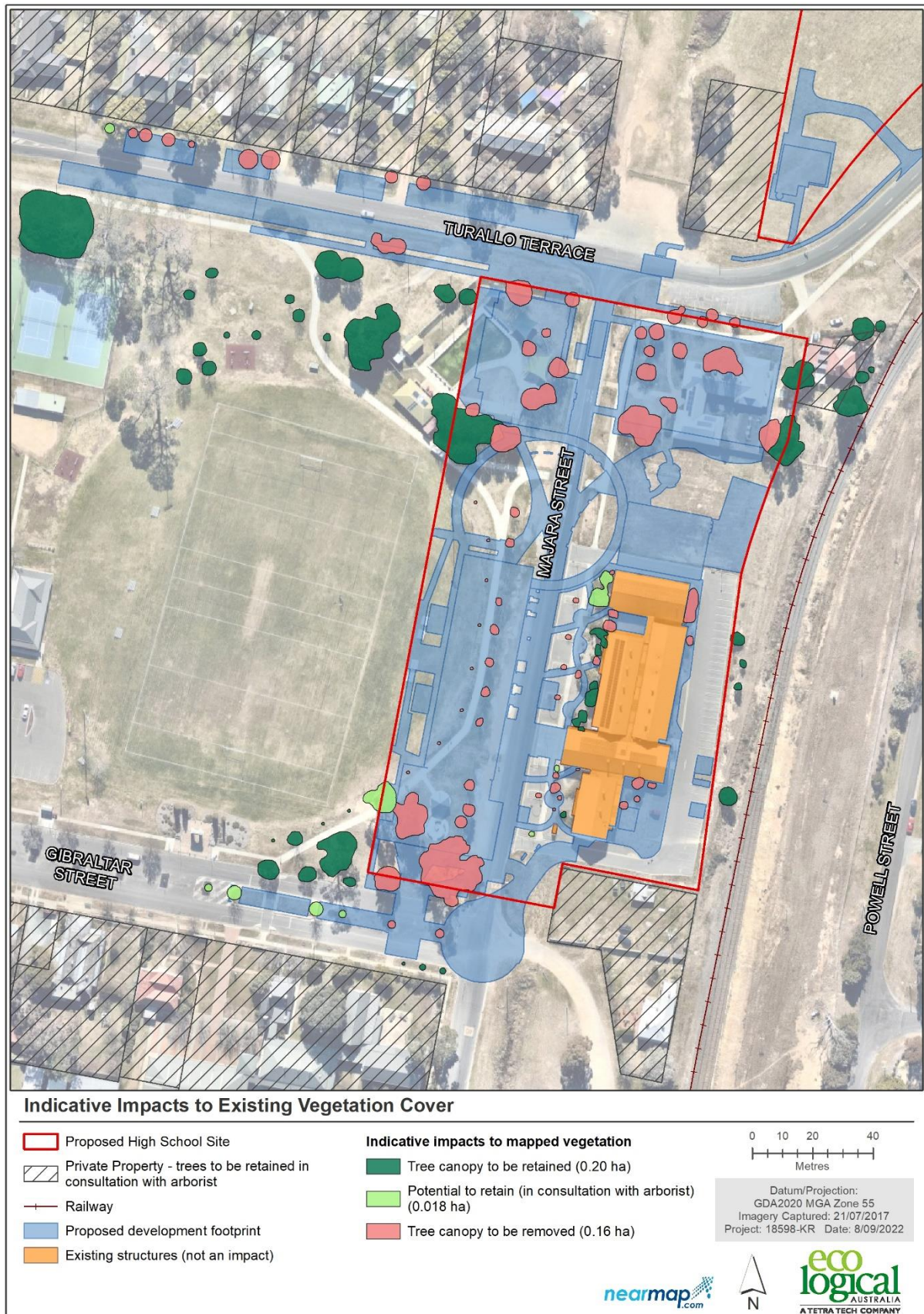


Figure 9: Indicative tree canopy impacts

Appendix D Tabulated results of arboricultural assessment

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
74	<i>Pinus pinea</i>	1	17	18	2400	Good	Good	Long (>40 years)	High	15.0	4.8	High	4.37%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	
89	<i>Fraxinus raywood</i>	1	8	7	300	Good	Good	Long (>40 years)	Medium	3.6	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	
90	<i>Fraxinus raywood</i>	1	7	7	300	Good	Good	Long (>40 years)	Medium	3.6	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	
91	<i>Pinus radiata</i>	1	6	6	300	Fair	Good	Long (>40 years)	Medium	3.6	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	
92	Deciduous unknown sp.	1	7	5	300	Good	Good	Long (>40 years)	Medium	3.6	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	deciduous
93	Deciduous unknown sp.	1	9	7	300	Good	Good	Long (>40 years)	Medium	3.6	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	
94	<i>Fraxinus sp.</i>	1	4	2	100	Good	Good	Long (>40 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	
95	<i>Fraxinus sp.</i>	1	5	3	100	Good	Good	Long (>40 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	deciduous
96	Deciduous unknown sp.	1	4	4	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	deciduous
97	Deciduous unknown sp.	1	7	5	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	0%		No Impact: 0%		Proposed to be retained	deciduous
98	Deciduous unknown sp.	1	8	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.7	Medium	0%		No Impact: 0%		Proposed to be retained	deciduous
99A	<i>Cupressus x leylandii</i>	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99B	<i>Cupressus x leylandii</i>	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99C	<i>Cupressus x leylandii</i>	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
99D	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99E	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99F	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99G	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99H	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99I	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99J	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
99K	Cupressus x leylandii	1	10	6	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 11 trees + multitrunked (split)
100	Pinus radiata	1	9	12	500	Good	Good	Long (>40 years)	High	6.0	2.5	High	0.42%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	Multi trunked
101	Pinus radiata	1	10	10	550	Good	Good	Long (>40 years)	High	6.6	2.6	High	1.48%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	
102	Acacia sp.	1	3	4	100	Fair	Fair	Short (5-15 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Multi trunked

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
103	Acacia sp.	1	3	6	100	Fair	Poor	Short (5-15 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Multi trunked
104	Melaleuca lanceolata	1	4	7	100	Fair	Fair	Short (5-15 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Multi trunked
105	Acacia sp.	1	5	7	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.7	Low	0%		No Impact: 0%		Proposed to be retained	included bark
106	Fraxinus raywood	1	8	7	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	0.87%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	
107	Deciduous unknown sp.	1	8	11	650	Good	Good	Long (>40 years)	Medium	7.8	2.8	Medium	73.59%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be removed	deciduous at time
108	Ulmus sp.	1	8	7	350	Good	Good	Long (>40 years)	Medium	4.2	2.1	Medium	100%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be removed	deciduous
109	Prunus sp.	1	5	7	250	Good	Good	Long (>40 years)	Low	3.0	1.8	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous at time
110	Fraxinus raywood	1	12	9	500	Good	Good	Long (>40 years)	High	6.0	2.5	High	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous
111	Fraxinus raywood	1	9	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be removed	deciduous
112	Fraxinus raywood	1	8	8	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous
113	Fraxinus raywood	1	8	8	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
115	Fraxinus raywood	1	8	5	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed buildings, Proposed covered walkway, Proposed landscaping or new pavement	Proposed to be removed	Collected as a group of 8 (split)
114A	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	58.01%	Yes	High Impact: >20%	Proposed covered walkway, Proposed landscaping or new pavement	Proposed to be removed	Collected as a group of 8 (split)
114B	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	45.39%	Yes	High Impact: >20%	Proposed buildings, Proposed covered walkway, Proposed landscaping or new pavement	Proposed to be removed	Collected as a group of 8 (split)
114C	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	1.24%		Low Impact: <10%	Proposed buildings, Proposed covered walkway	Proposed to be retained	Collected as a group of 8 (split)
114D	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 (split)
114E	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 (split)
114F	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 (split)
114G	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 (split)
114H	Casuaurina sp.	1	12	8	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	43.63%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be removed	deciduous

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
143A	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	2.57%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	deciduous at time
143B	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	0%		No Impact: 0%		Proposed to be retained	deciduous at time
143C	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	7.59%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	
143D	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement, Proposed sporting facilities	Proposed to be removed	deciduous at time
143E	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement, Proposed sporting facilities	Proposed to be removed	deciduous at time
143F	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement, Proposed sporting facilities	Proposed to be removed	deciduous at time
143G	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement, Proposed sporting facilities	Proposed to be removed	deciduous at time
143H	<i>Eucalyptus sp.</i>	1	16	9	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	deciduous at time
116	<i>Deciduous unknown sp.</i>	1	9	10	500	Good	Good	Long (>40 years)	Medium	6.0	2.5	Medium	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	deciduous at time
117	<i>Fraxinus raywood</i>	1	9	7	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	deciduous at time

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
118	<i>Pinus radiata</i>	1	14	11	750	Good	Fair	Long (>40 years)	High	9.0	2.9	High	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	deciduous at time
119	<i>Quercus robur</i>	1	10	10	550	Good	Good	Long (>40 years)	High	6.6	2.6	High	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement, Proposed sporting facilities	Proposed to be removed	deciduous at time
120	<i>Quercus robur</i>	1	10	10	550	Good	Good	Long (>40 years)	High	6.6	2.6	High	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	deciduous at time
121	<i>Quercus robur</i>	1	8	6	280	Good	Good	Long (>40 years)	Medium	3.4	1.9	Medium	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	deciduous at time + multitrunked
122	<i>Quercus robur</i>	1	7	10	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	43.61%	Yes	High Impact: >20%	Proposed landscaping or new pavement, Proposed sporting facilities	Proposed to be removed	deciduous at time
123	<i>Betula alba</i>	1	8	6	250	Good	Good	Long (>40 years)	Medium	3.0	1.8	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	deciduous at time
124	<i>Betula alba</i>	1	6	5	200	Good	Good	Long (>40 years)	Low	2.4	1.7	Low	41.96%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	inclusion deciduous at time
125	<i>Malus sp.</i>	1	5	6	250	Good	Good	Medium (15-40 years)	Medium	3.0	1.8	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	deciduous at time
126	<i>Fraxinus raywood</i>	1	8	7	320	Good	Good	Long (>40 years)	Medium	3.8	2.1	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	deciduous at time
127	<i>Fraxinus raywood</i>	1	5	6	250	Good	Good	Long (>40 years)	Medium	3.0	1.8	Medium	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	deciduous at time
128	<i>Fraxinus raywood</i>	1	9	8	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
129	<i>Prunus sp.</i>	1	6	6	200	Good	Fair	Medium (15-40 years)	Low	2.4	1.7	Low	100%	Yes	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	
130	<i>Castanospermum australe</i>	1	8	9	400	Good	Good	Medium (15-40 years)	Medium	4.8	2.3	Medium	0%		No Impact: 0%		Proposed to be retained	
131	<i>Castanospermum australe</i>	1	4	4	200	Good	Fair	Medium (15-40 years)	Low	2.4	1.7	Low	0%		No Impact: 0%		Proposed to be retained	
132	<i>Castanospermum australe</i>	1	6	7	280	Good	Fair	Medium (15-40 years)	Medium	3.4	1.9	Medium	5.24%		Low Impact: <10%	Proposed sporting facilities	Proposed to be retained	
133	<i>Prunus sp.</i>	1	4	5	150	Good	Fair	Medium (15-40 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	unable to see properly
134	<i>Prunus sp.</i>	1	5	5	200	Good	Good	Medium (15-40 years)	Low	2.4	1.7	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Potential	High Impact: >20%	Proposed sporting facilities	Proposed to be removed	Collected as a group of 8 in childcare playground (split)
136	<i>Fraxinus raywood</i>	1	3	3	100	Good	Good	Long (>40 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 in childcare playground (split)
137	<i>Eucalyptus sp.</i>	1	15	9	600	Good	Good	Long (>40 years)	High	7.2	2.7	High	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 in childcare playground (split)
138	<i>Eucalyptus sp.</i>	1	14	10	600	Good	Good	Long (>40 years)	High	7.2	2.7	High	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 in childcare playground (split)
139	<i>Eucalyptus sp.</i>	1	14	7	350	Good	Good	Long (>40 years)	High	4.2	2.1	High	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 in childcare playground (split)
140	<i>Eucalyptus sp.</i>	1	14	6	400	Poor	Poor	Short (5-15 years)	Low	4.8	2.3	Low	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 in childcare playground (split)
141	<i>Eucalyptus sp.</i>	1	15	13	600	Good	Good	Long (>40 years)	High	7.2	2.7	High	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 in childcare playground (split)

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
142	<i>Eucalyptus sp.</i>	1	9	5	200	Fair	Fair	Long (>40 years)	Medium	2.4	1.7	Medium	0%		No Impact: 0%		Proposed to be retained	Collected as a group of 8 in childcare playground (split)
144	<i>Eucalyptus sp.</i>	1	17	14	550	Good	Good	Long (>40 years)	High	6.6	2.6	High	0%		No Impact: 0%		Proposed to be retained	
145	<i>Prunus sp.</i>	1	5	7	200	Good	Good	Medium (15-40 years)	Medium	2.4	1.7	Medium	0%		No Impact: 0%		Proposed to be retained	Multi trunked
146	<i>Prunus sp.</i>	1	4	8	240	Good	Good	Medium (15-40 years)	Medium	2.9	1.8	Medium	0%		No Impact: 0%		Proposed to be retained	
147	<i>Betula alba</i>	1	5	5	250	Good	Fair	Long (>40 years)	Medium	3.0	1.8	Medium	0%		No Impact: 0%		Proposed to be retained	Multi trunked
148	<i>Betula alba</i>	1	6	6	400	Good	Fair	Long (>40 years)	Medium	4.8	2.3	Medium	0%		No Impact: 0%		Proposed to be retained	lopped
149	<i>Eucalyptus sp.</i>	1	17	15	600	Good	Good	Long (>40 years)	High	7.2	2.7	High	0%		No Impact: 0%		Proposed to be retained	
150	<i>Eucalyptus sp.</i>	1	7	4	300	Fair	Fair	Long (>40 years)	Medium	3.6	2.0	Medium	0%		No Impact: 0%		Proposed to be retained	Leaning
151	<i>Eucalyptus sp.</i>	1	5	5	300	Fair	Fair	Long (>40 years)	Medium	3.6	2.0	Medium	0%		No Impact: 0%		Proposed to be retained	
152	<i>Eucalyptus sp.</i>	1	18	10	400	Good	Good	Long (>40 years)	High	4.8	2.3	High	0%		No Impact: 0%		Proposed to be retained	
153	<i>Platanus orientalis</i>	1	6	6	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	>20% (Proposed impact determined from consultation with CONTEXT)	Potential	High Impact: >20%	Level change within school common (CONTEXT)	Proposed to be removed	
154	<i>Platanus orientalis</i>	1	8	6	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	52.86%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	
155	<i>Platanus orientalis</i>	1	7	5	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	
156	<i>Platanus orientalis</i>	1	7	5	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	
157	<i>Platanus orientalis</i>	1	7	5	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	
158	<i>Platanus orientalis</i>	1	8	6	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
159	<i>Platanus orientalis</i>	1	5	3	250	Fair	Fair	Long (>40 years)	Low	3.0	1.8	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	
160	<i>Platanus orientalis</i>	1	7	6	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	
161	<i>Ulmus sp.</i>	1	3	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Potential	High Impact: >20%	Level change within school common (CONTEXT)	Proposed to be removed	
162	<i>Ulmus sp.</i>	1	3	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	deciduous at time
163	<i>Ulmus sp.</i>	1	3	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous at time
164	<i>Ulmus sp.</i>	1	1	0	100	Poor	Poor	Remove (<5 years)	Low	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	
165	<i>Ulmus sp.</i>	1	2	1	100	Good	Good	Long (>40 years)	Low	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous at time
166	<i>Ulmus sp.</i>	1	3	1	100	Good	Good	Long (>40 years)	Low	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous at time
167	<i>Ulmus sp.</i>	1	3	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous at time
168	<i>Eucalyptus sp.</i>	1	13	6	400	Fair	Fair	Medium (15-40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	inclusion
169	<i>Deciduous unknown sp.</i>	1	7	6	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous
170	<i>Pinus radiata</i>	1	20	22	1750	Good	Good	Long (>40 years)	Medium	15.0	4.2	Low	80.37%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be removed	

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171	<i>Eucalyptus sp.</i>	1	18	16	1000	Good	Good	Long (>40 years)	High	12.0	3.3	High	100%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be removed	
172	<i>Eucalyptus sp.</i>	1	18	12	900	Good	Good	Long (>40 years)	High	10.8	3.2	High	31.81%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Potential to retain (in consultation with arborist)	
173	<i>Eucalyptus sp.</i>	1	12	10	400	Good	Good	Long (>40 years)	Medium	4.8	2.3	Medium	100%	Yes	High Impact: >20%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be removed	
174	<i>Pinus radiata</i>	1	15	11	850	Good	Good	Long (>40 years)	High	10.2	3.1	High	50.13%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	
175	<i>Pinus radiata</i>	1	21	18	1300	Fair	Fair	Long (>40 years)	High	15.0	3.7	High	6.76%		Low Impact: <10%	Proposed buildings, Proposed landscaping or new pavement	Proposed to be retained	
176	<i>Ulmus sp.</i>	1	3	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	deciduous at time
177	<i>Ulmus sp.</i>	1	4	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	
178	<i>Fraxinus raywood</i>	1	5	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.7	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	deciduous at time
179	<i>Fraxinus sp.</i>	1	5	6	250	Good	Good	Long (>40 years)	Medium	3.0	1.8	Medium	0%		No Impact: 0%		Proposed to be retained	deciduous at time
180	<i>Fraxinus sp.</i>	1	7	7	300	Good	Good	Long (>40 years)	Medium	3.6	2.0	Medium	0%		No Impact: 0%		Proposed to be retained	deciduous at time + multitrunked
181	<i>Deciduous unknown sp.</i>	1	9	10	400	Good	Good	Long (>40 years)	High	4.8	2.3	High	0%		No Impact: 0%		Proposed to be retained	
182	<i>Ulmus sp.</i>	1	3	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
183	<i>Fraxinus raywood</i>	1	11	10	400	Good	Good	Long (>40 years)	High	4.8	2.3	High	0%		No Impact: 0%		Proposed to be retained	deciduous at time
210	<i>Deciduous unknown sp.</i>	1	4	4	150	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Potential	High Impact: >20%	Localised leveling adjustments (CONTEXT)	Proposed to be removed	
211	<i>Deciduous unknown sp.</i>	1	7	3	150	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	deciduous
212A	<i>Group of mix native spp.</i>	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.7	Medium	14.33%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Potential to retain (in consultation with arborist)	Originally collected as a "Group of 10 mix native spp.", not all met the definition of a tree (Tree 212). Group split and number adjusted to match survey locations (5 survey points)
212B	<i>Group of mix native spp.</i>	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.5	Medium	15.03%	Yes	High Impact: >20%	Proposed covered walkway, Proposed landscaping or new pavement	Potential to retain (in consultation with arborist)	Originally collected as a "Group of 10 mix native spp.", not all met the definition of a tree (Tree 212). Group split and number adjusted to match survey locations (5 survey points)

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
212C	Group of mix native spp.	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.5	Medium	14.72%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Potential to retain (in consultation with arborist)	Originally collected as a "Group of 10 mix native spp.", not all met the definition of a tree (Tree 212). Group split and number adjusted to match survey locations (5 survey points)
212D	Group of mix native spp.	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.5	Medium	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	Originally collected as a "Group of 10 mix native spp.", not all met the definition of a tree (Tree 212). Group split and number adjusted to match survey locations (5 survey points)
212E	Group of mix native spp.	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.5	Medium	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	Originally collected as a "Group of 10 mix native spp.", not all met the definition of a tree (Tree 212). Group split and number adjusted to match survey locations (5 survey points)
213	Deciduous unknown sp.	1	4	5	150	Good	Fair	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Potential	High Impact: >20%	Localised leveling adjustments (CONTEXT)	Proposed to be removed	deciduous at time

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
214A	Group of native spp.	1	5	3	150	Fair	Fair	Short (5-15 years)	Medium	2.0	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	Originally collected as a "Group of 10 native spp.", not all met the definition of a tree (Tree 214). Group split and number adjusted to match survey locations (4 survey points)
214B	Group of native spp.	1	5	3	150	Fair	Fair	Short (5-15 years)	Medium	2.0	1.5	Medium	1.90%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	Originally collected as a "Group of 10 native spp.", not all met the definition of a tree (Tree 214). Group split and number adjusted to match survey locations (4 survey points)
214C	Group of native spp.	1	5	3	150	Fair	Fair	Short (5-15 years)	Medium	2.0	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	Originally collected as a "Group of 10 native spp.", not all met the definition of a tree (Tree 214). Group split and number adjusted to match survey locations (4 survey points)
214D	Group of native spp.	1	5	3	150	Fair	Fair	Short (5-15 years)	Medium	2.0	1.5	Medium	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	Originally collected as a "Group of 10 native spp.", not all met the definition of a tree (Tree 214). Group split and number adjusted to match survey locations (4 survey points)

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
215	Unknown sp.	1	3	3	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	
216	Unknown sp.	1	7	4	150	Good	Fair	Long (>40 years)	Medium	2.0	1.5	Medium	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	deciduous
217	Group of 5 acacia sp.	5	5	4	150	Fair	Fair	Short (5-15 years)	Medium	2.0	1.5	Medium	14.01%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	Point not split as incorrect number of surveyed tree points to what was verified on site.
218	Deciduous unknown sp.	1	5	4	150	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	6.25%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	
219	Deciduous unknown sp.	1	3	4	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed COLA, Localised leveling adjustments (CONTEXT)	Proposed to be removed	
220	Deciduous unknown sp.	1	6	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.7	Medium	0%		No Impact: 0%		Proposed to be retained	
221	Deciduous unknown sp.	1	5	4	150	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	2.28%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	
222	Deciduous unknown sp.	1	3	3	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
223	<i>Deciduous unknown sp.</i>	1	4	3	150	Good	Fair	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	
224	<i>Deciduous unknown sp.</i>	1	3	6	100	Fair	Fair	Long (>40 years)	Medium	2.0	1.5	Low	2.38%		Low Impact: <10%	Proposed landscaping or new pavement	Proposed to be retained	
225A	<i>Deciduous unknown sp.</i>	1	6	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.7	Medium	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	Originally collected as a group of 5. Group split and aligned to survey locations
225B	<i>Deciduous unknown sp.</i>	1	6	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.5	Medium	33.09%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Potential to retain (in consultation with arborist)	Originally collected as a group of 5. Group split and aligned to survey locations
225C	<i>Deciduous unknown sp.</i>	1	6	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.5	Medium	>20% (Proposed impact determined from consultation with CONTEXT)	Yes	High Impact: >20%	Proposed landscaping or new pavement, localised leveling adjustments (CONTEXT)	Proposed to be removed	Originally collected as a group of 5. Group split and aligned to survey locations
225D	<i>Deciduous unknown sp.</i>	1	6	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.5	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Originally collected as a group of 5. Group split and aligned to survey locations
225E	<i>Deciduous unknown sp.</i>	1	6	5	200	Good	Good	Long (>40 years)	Medium	2.4	1.5	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Originally collected as a group of 5. Group split and aligned to survey locations

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
226	Deciduous unknown sp.	1	5	5	150	Good	Fair	Long (>40 years)	Medium	2.0	1.5	Low	>20% (Proposed impact determined from consultation with CONTEXT)	Potential	High Impact: >20%	Localised leveling adjustments (CONTEXT)	Proposed to be removed	
227	Deciduous unknown sp.	1	7	9	200	Good	Good	Long (>40 years)	Medium	2.4	1.7	Medium	22.25%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Potential to retain (in consultation with arborist)	
228	Acacia sp.	1	4	5	150	Poor	Poor	Remove (<5 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	Multi trunked
229	Deciduous unknown sp.	1	4	2	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	
230	Eucalyptus sp.	1	3	2	100	Good	Fair	Long (>40 years)	Medium	2.0	1.5	Medium	0%		No Impact: 0%		Proposed to be retained	Multi trunked
231	Eucalyptus sp.	1	6	4	200	Good	Fair	Long (>40 years)	Medium	2.4	1.7	Medium	0%		No Impact: 0%		Proposed to be retained	Multi trunked
232	Pinus radiata	1	7	7	350	Fair	Fair	Long (>40 years)	Medium	4.2	2.1	Medium	0%		No Impact: 0%		Proposed to be retained	
233	Deciduous unknown sp.	1	4	4	200	Good	Good	Long (>40 years)	Medium	2.4	1.7	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	
234	Acacia sp.	1	6	4	200	Poor	Poor	Remove (<5 years)	Low	2.4	1.7	Low	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	
235	Deciduous unknown sp.	1	6	6	280	Good	Good	Long (>40 years)	Medium	3.4	1.9	Medium	100%	Yes	High Impact: >20%	Proposed fire pump room enclosure, Proposed landscaping or new pavement	Proposed to be removed	
236	Deciduous unknown sp.	1	4	3	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	
290A	Malus sp.	1	2	2	100	Good	Fair	Long (>40 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	street tree
290B	Malus sp.	1	2	1	100	Good	Good	Long (>40 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	street tree
291	Malus sp.	1	2	2	100	Good	Good	Long (>40 years)	Low	2.0	1.5	Low	0%		No Impact: 0%		Proposed to be retained	street tree

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
400	Ulmus sp.	1	3	1	100	Good	Good	Long (>40 years)	Medium	2.0	1.5	Low	100%	Yes	High Impact: >20%	Proposed buildings	Proposed to be removed	deciduous at time. Tree species and other data duplicated from Tree 167 following site inspection over Teams with Nick Valois 7/7/22
401	Group of mix native spp.	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.5	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Duplicated tree data from Group tree 212. Matched number of trees picked up by surveyor
402	Group of mix native spp.	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.5	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Duplicated tree data from Group tree 212. Matched number of trees picked up by surveyor
403	Group of mix native spp.	1	5	4	200	Fair	Fair	Short (5-15 years)	Medium	2.4	1.5	Medium	100%	Yes	High Impact: >20%	Proposed landscaping or new pavement	Proposed to be removed	Duplicated tree data from Group tree 212. Matched number of trees picked up by surveyor
404	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
405	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
406	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation & CONTEXT		Medium Impact: >10%		Potential to retain (in consultation with arborist)	
407	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		Medium Impact: >10%		Potential to retain (in consultation with arborist)	
408	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		Medium Impact: >10%		Potential to retain (in consultation with arborist)	
409	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		Medium Impact: >10%		Potential to retain (in consultation with arborist)	

Tree ID	Botanical name	Trees in Group	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Safe Useful Life Expectancy (SULE)	Landscape Significance	TPZ (m)	SRZ (m)	Retention Value	TPZ Impact Encroachment (%)	SRZ Encroachment (yes/no)	Impact	Impact Area	Proposed Action	Notes
410	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
411	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
412	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
413	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
414	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
415	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
416	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		Medium Impact: >10%		Potential to retain (in consultation with arborist)	
417	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	
418	Unknown sp.	1										Retention Value not assessed	Proposed impact determined from client consultation		High Impact: >20%		Proposed to be removed	

Appendix E Tree protection guidelines

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

E1 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).
- 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".

E2 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.

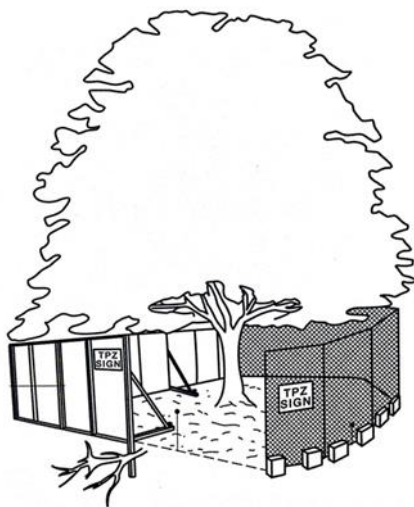
E3 Trunk protection

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.

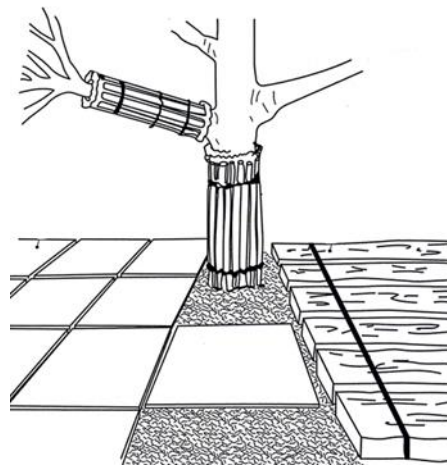
The removal of bark or branches allows the potential ingress of micro-organisms which may cause decay. Furthermore, the removal of bark restricts the trees' ability to distribute water, mineral ions (solutes), and glucose.

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



Tree protection fencing



Trunk protection fencing

E4 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.

E5 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.

E6 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 boring and bore pits on retained trees.

Appendix F Site photos



Figure 10: Medium retention value tree, Tree 107



Figure 11: Medium retention value trees 114.1, 114.2, 114.3, 114.4, 114.5, 114.6, 114.7 and 114.8



Figure 12: Low retention value tree, Tree 140



Figure 13: Medium retention value tree, Tree 153



Figure 14: Medium retention value tree, 154



Figure 15: Medium retention value Trees 212.1, 212.2, 212.3, 212.4 and 212.5



Figure 16: Medium retention value tree, Tree 227

Appendix G Site plan (TKD Architects 2022)

