

An architectural rendering of a modern school building with a brick and wood facade, large windows, and a courtyard with trees and children playing. The building has multiple levels with balconies and a large glass-enclosed area on the ground floor. The courtyard features a brick-paved area where children are playing, and a paved walkway with more children. Trees and greenery are integrated into the design.

Upgrades to Chatswood Public School and Chatswood High School

Appendix 11 - Arborist Report - High School

SSD 9483

Prepared by PSM & JBS&G

For School Infrastructure NSW, Department of Education

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Upgrades to Chatswood High School - Arboricultural Impact Assessment

Architectus on behalf of Department of Education

DOCUMENT TRACKING

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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. Background

1.1 Proposed activity

Eco Logical Australia Pty Ltd (ELA) was engaged by Architectus on behalf of the Department of Education (DoE) to prepare an Arboricultural Impact Assessment (AIA) for the proposed Upgrades to the Chatswood High School project. This report assesses trees on the Chatswood High School site.

The Department of Education (DoE) propose to upgrade the teaching facilities of the Chatswood High School (referred to as 'the development site'). This will include the redevelopment of the Chatswood Public School and Chatswood High School. The proposed redevelopment is a School Infrastructure (SI) project, which will be governed by the NSW Government Gateway Review Process and assessed as State Significant Development (SSD) (application SSD 18_9483) in accordance with both the *State Environmental Planning Policy* (Educational Establishments and Child Care Facilities) 2017 and NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The works will be carried out over multiple stages.

The key features of the proposed development that are likely to negatively affect the subject trees (trees within the study area) can be summarised as follows:

- excavation works
- plant movement
- changes in soil grades
- installation of underground services.

1.2 The study area

Chatswood High School is located at 24 Centennial Avenue, Chatswood. The total land area of Chatswood High School is 5.7 ha and is located within the local government area of Willoughby. The study area is mapped in Figure 1.

1.3 Purpose of report

The purpose of this report is to:

- identify the trees within the study area that are likely to be affected by the proposed works
- assess the current overall health and condition of the subject trees
- evaluate the retention value of the subject trees
- determine the likely impact to the subject trees.

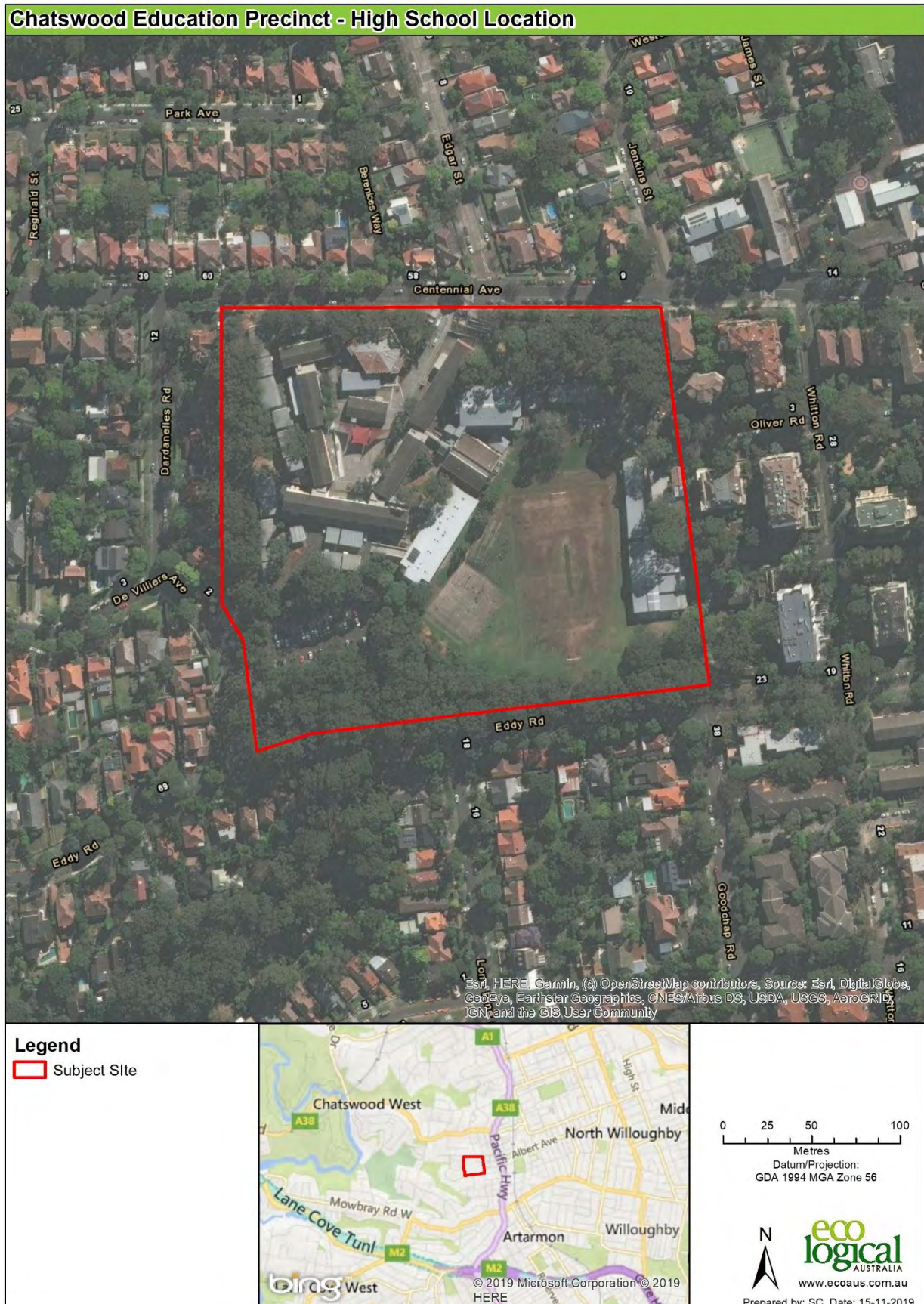


Figure 1: Subject site location

2. Method

2.1 Definitions used in this assessment

2.1.1 Definition of a tree

Willoughby City Council (2012) defines a tree as having:

“a height exceeding 4 metres or; a trunk girth (circumference) exceeding 600 millimetres measured at 1.2 metres above ground level or exceeding 3 metres”

2.1.2 Tree protection zone (TPZ)

The TPZ is the combination of crown and root area (as defined by AS 4970-2009) that requires restriction of access during the construction process. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.

2.1.3 Structural root zone (SRZ)

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

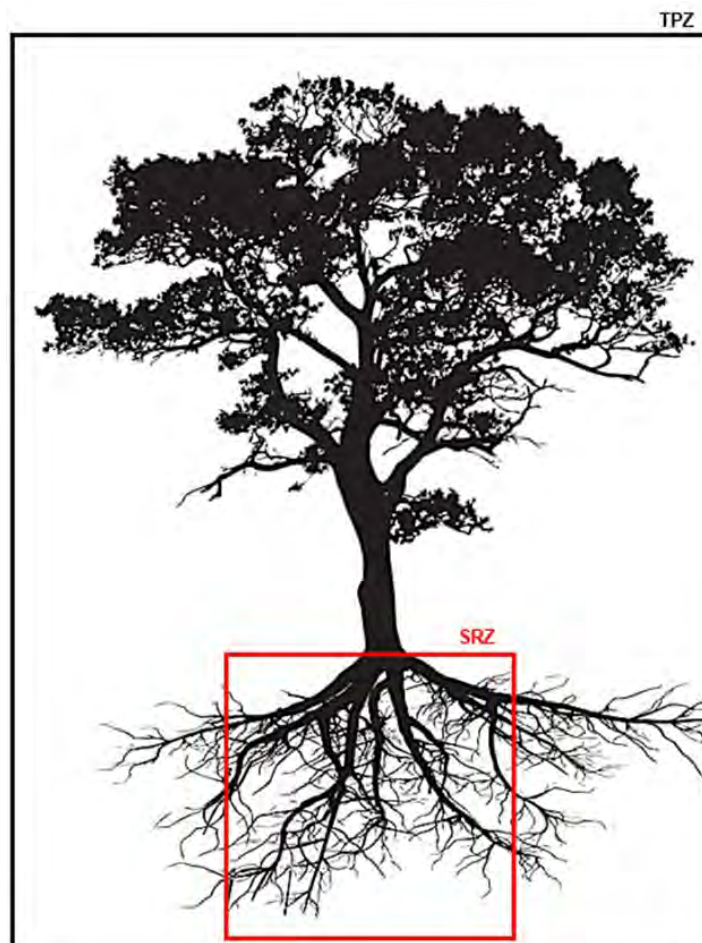


Figure 2: Indicative TPZ and SRZ

2.2 Tree assessment

The health and structure of the subject trees was assessed in accordance with a stage one visual tree assessment (VTA) as formulated by Mattheck and Breloer (1994), and practices consistent with modern arboriculture. Measurements to determine the tree protection zone were carried out in accordance with *Clause 3.2 and 3.3.5 of AS4970-2000 Protection of Trees on Development Sites* (Standards Australia 2009).

A total of **213 trees** were inspected in January and February 2020 by AQF Level 5 Consulting Arborist, David Bidwell. This updates an assessment done in 2018 by AQF 5 Consulting Arborist Elizabeth Hannon.

The following applies to this methodology:

- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and testing. Trees that met with the definition of a tree by Willoughby Council's guidelines (WLEP 2012 AND WDCP C9)
- No aerial inspections or root mapping was undertaken.
- Tree heights were determined using a clinometer 15 m from the base of the tree
- Canopy spread was determined using a measured stride out on site.
- The diameter at breast height (DBH) was measured by placing a diameter tape around the trunk of the tree at 1.4 m above ground and recording the measurement. The DBH measurements were used to determine the area for the tree protection zone (which also incorporates the structural root zone).
- The structural root zone (SRZ) was calculated by an estimated measurement of the trunk diameter taken above the root buttress
- Tree identification to species level was based on broad taxonomical features present and visible from ground level at the time of inspection.

Trees that were not included in the assessment are as follows:

- Previously assessment trees 75, 127, 134, 136, 144 and 204 were not found on site at the time of the 2020 inspection and have therefore been excluded from the assessment.
- The removal of trees 88, 90, 91, 125, 151 and 198 are subject to an alternative approvals pathway as they are related to tree health and public safety issues and have therefore not been included in this arboricultural impact assessment. (Note that the three dead tree stumps to be retained are included in this assessment – trees 15, 199, 209.)
- Trees 105, 106, 116 and 215 have been approved for removal under *TVPA-2019/428 – Exempt Works* and have therefore not been included in this arboricultural impact assessment.
- Trees 67, 68, 99, 101, 102, 103 and 104 have been approved for removal under *TVPA 2019-364 – Complying Development Work* and have therefore not been included in this arboricultural impact assessment.

2.3 Retention value

The retention value/importance of a tree or group of trees is determined using a combination of environmental, cultural, physical and social values. This tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Arboriculturists (IACA) *Significance of a Tree, Assessment Rating System (STARS®)*. The following categories were used:

- **Low:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- **Medium:** These trees are moderately important for retention. Their removal should only be considered if adversely affected by the proposed works and all other alternatives have been considered and exhausted.
- **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 AS4970 - Protection of trees on development sites.

Further details and assessment criteria are in Appendix A.

2.4 Potential impacts

Trees may be impacted by cutting or damaging roots or branches. Impacts to the tree protection zones are determined by the percentage of the area that the development incurs into the tree protection zone. The following are the definition of these impacts:

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

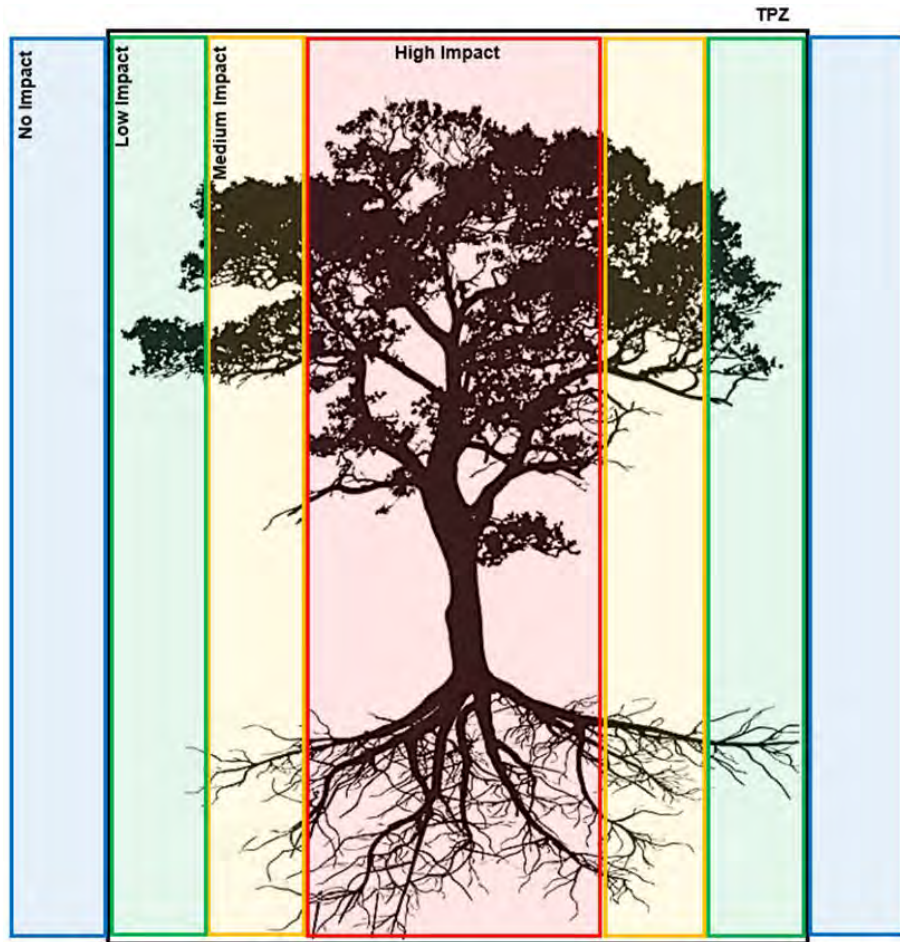


Figure 3: Indicative zones of impact

2.5 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 suitable for retention granted they follow the specific mitigation measures discussed in section 3 and / or the tree protection measures outlined in section 4 and / or the tree protection guidelines outlined in Appendix B.

3. Results and discussion

Tree locations and retention values are mapped in Appendix C. Results of the arboricultural impact assessment are mapped in Appendix C and tabulated in Appendix D. A summary of the arboricultural impact assessment is outlined in Table 1 below.

Table 1: Summary of tree impacts and their retention values

Retention value	High Impact	Medium Impact	Low Impact	No Impact	Total
Priority for retention (High)	17	6	12	23	58
Consider for retention (Medium)	17	4	8	78	107
Consider for removal (Low)	10		2	33	45
Dead tree stumps to be retained					3
Total	44	10	22	134	213

3.1 Trees to be retained

A total of 189 trees (including three dead tree stumps) have been identified for retention. Any construction works occurring within the TPZ of trees to be retained must be in consultation and under supervision of an AQF Level 5 Consulting Arborist.

Trees 15, 199 and 209 are dead stumps and should be retained for habitat within the biodiversity zone.

All trees subject to no impact (0 % TPZ encroachment) or low impact (<10% TPZ encroachment) must comply with the general mitigation measures.

The following trees can be retained with construction within the TPZ using tree sensitive techniques in consultation with the AQF Level 5 project arborist:

- Tree 25, 26, 38, 40, 43, 63, 65, 78, 79, 80, 96, 97, 100, 110, 113, 117, 129, 130, 131, 166

Tree 164 can also be retained as the impact shown is an existing bridge and it has been advised by the client that no new works will be occurring around this tree.

The following trees can be retained as all construction works within the TPZs will be built on top of existing surfaces, with no excavation required. General tree protection methods will be sufficient, as outlined in section 4 and Appendix B.

- Trees 185, 186, 187 and 188

Tree 84 was discussed on site and changes to the construction of the large steps is being considered to allow retention of the tree. Any work that will be within the TPZ should be carried out in consultation with the Project Arborist.

It has been noted that retention of Trees 39 and 95 has been requested. The impact of the proposed plans on both trees will be high, and demolition and construction so close to such large mature trees

would normally be considered as incompatible with tree retention. As well as the standard tree and trunk protection, it will be necessary to erect scaffolding and hoarding between the trees and the current building, to the height of the current building to prevent damage to the trunks and lower canopies of the trees during demolition of the building. This should be carried out under the supervision of the Project Arborist. A specific hold point is outlined in section 4.

The best chance of successful tree retention and long-term tree viability will be to retain the concrete path and ground level of the existing building in order not to disturb any roots growing under the path and building. In this case, the new buildings would then be constructed on top of the existing path and foundations.

If demolition of the concrete path is non-negotiable, there is a high likelihood that large structural roots will be found. It may be attempted to demolish the path using hand tools, in order to avoid damage to any roots which may be growing beneath, and under the existing building. This should be carried out under the supervision of the Project Arborist. This should be a specific hold point and root investigation should take place. If roots are found to extend under the building, the viability for tree retention should be re-evaluated, as it is possible that the removal of the buildings may undermine the anchorage, and result in undesirable changes around the root zones, to the point where tree retention may be considered not to be viable.

If the trees are retained it will be necessary to construct the new building and other structures within the TPZs using tree sensitive techniques in order to avoid damage to roots. This may involve the use of piers and beams for footings to bridge over roots. If these methods are not possible to use, tree retention will not be viable.

3.2 Trees proposed to be removed under the current footprint

A total of 24 trees have been identified for removal based on the proposed footprint and conversations of intent with the client. These trees are as follows:

Trees 20, 21, 33, 45, 46, 83, 87, 89, 92, 93, 94, 98, 126, 132, 189, 191, 200, 219, 225, 226, 227, 232, 233 and 234

The following trees are recommended for removal as per the reasonings below:

- Tree 20 will be subject to excavation works relating to construction of the new stairwell.
- Tree 233 will be subject to excavation works related to the widening of the stairwell.
- Tree 227 - A self-sown Fig is located where it has insufficient space for long term development.

All tree removal must be carried out in compliance with the tree protection guidelines outlined in section 4 of this report.

3.3 The following trees are recommended for additional attention:

- Tree 8 - tree is heavily defoliated. Possible cause not identified, requires further investigation.
- Tree 9 - tree is heavily defoliated. Possible cause not identified, requires further investigation.
- Tree 184 - wound on lower fork requires further investigation.

- Tree 190 - appears to have moved in the ground storms. Appears stable, however for retention to be viable a Tree Risk Assessment needs to be completed prior to construction. This is outlined as a hold point in section 4.

4. Tree protection plan

Following the approval of a proposed building envelope, the following measures are to be implemented to protect trees to be retained:

4.1 Tree pruning and removal

- All tree work 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).
- Permission must be granted from the relevant consent authority prior to removing or pruning of any of the subject trees.

4.2 Tree protection measures

Encroachment within the TPZ must be offset with a range of mitigation measures to ensure that impacts to the subject tree(s) are reduced or restricted wherever possible. Mitigation must be increased relative to the level of encroachment within the TPZ to ensure the subject tree remains viable. Table 2 outlines mitigation requirements under AS 4970-2009 within each category of encroachment. Tree protection measures should be implemented by the contractor and would include:

- Tree protection fencing must be established around the perimeter of the TPZ (Table 2). If the protective fencing requires temporary removal, trunk, branch and ground protection must be installed and must comply with *AS 4970-2009 - Protection of trees on development sites*. Existing fencing and site hoarding may be used as tree protection fencing.
- If temporary access for machinery is required within the TPZ, ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Ground protection may include a permeable membrane such as geotextile fabric beneath a layer of mulch, crushed rock or rumble boards.
- Any additional construction activities within the TPZ of the subject trees must be assessed and approved by the project arborist and must comply with *AS 4970-2009 - Protection of trees on development sites*.

Further information and guidelines on tree protection are in Appendix B.

4.3 Hold points, inspection and certification

An AQF Level 5 consulting project arborist needs to be involved in all stages of the development.

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

- The project arborist (AQF Level 5 consulting arborist) to inspect of the erect scaffolding and hoarding between trees 39 and 95 and the current building, to the height of the current building, to prevent damage to the trunks and lower canopies of the trees, during demolition of the building.
- A Tree Risk Assessment be completed by a qualified AQF Level 5 Consulting Arborist on Tree 190 to ensure retention is viable.
- Indicate clearly (with spray paint on trunks) trees marked for removal.
- During construction
 - Any construction works occurring within the TPZ of trees to be retained must be in consultation and under supervision of an AQF Level 5 Consulting Arborist.
 - If demolition of the concrete path is non-negotiable, there is a high likelihood that large structural roots will be found. It may be attempted to demolish the path using hand tools, in order to avoid damage to any roots which may be growing beneath, and under the existing building. This should be carried out under the supervision of the Project Arborist (AQF Level 5 consulting arborist).
 - Monthly inspection of trees by the project arborist (or other timing as agreed with the project arborist)
 - Notification to be given prior to the commencement of work within the tree protection zone, 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.

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.

4.4 Replacement planting

Any loss of trees should be offset with replacement planting in accordance with the relevant offset policy and in consultation with Willoughby City Council.

Table 2: Mitigation measures

Impact	Requirements under AS 4970-2009	Mitigation (design phase)	Mitigation (construction phase)
Low impact (<10%)	<p>The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.</p> <p>Detailed root investigations should not be required.</p>	N/A	<p>The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.</p> <p>Tree protection must be installed.</p>
Medium impact (<20%)	<p>The project arborist must demonstrate the tree(s) would remain viable.</p> <p>Root investigation by non-destructive methods may be required.</p> <p>Consideration of relevant factors including: Root location and distribution, tree species, condition, site constraints and design factors.</p> <p>The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.</p>	<p>The following design changes should be considered to retain trees where practicable, considering the retention value of the tree and the complexity and cost of the change.</p> <p>Relocate services/pathways outside of tree protection zones</p> <p>Design services to be installed at a minimum depth of 1200mm below ground to avoid impact to the root zones of trees.</p> <p>Design pathways to be installed on or above grade, minimising/eliminating excavation within tree protection zones.</p> <p>Design pathways using porous materials (eco-paving, porous asphalt, decomposed granite) to allow water and oxygen to reach the root zone.</p> <p>Design pathways using tree sensitive techniques (pier and beam, suspended slabs).</p> <p>The area lost to encroachment should be compensated for elsewhere, contiguous with the TPZ.</p>	<p>The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.</p> <p>The project arborist would be consulted for any works within the TPZ.</p> <p>Tree protection must be installed.</p> <p>Tree sensitive techniques can be used to install services within the TPZ. Horizontal directional drilling (HDD), boring, non-destructive excavation (NDE).</p> <p>Location and distribution of roots may be determined through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), air spade and manual excavation.</p>

High impact (>20%)

The project arborist must demonstrate the tree(s) would remain viable.

Root investigation by non-destructive methods may be required.

Consideration of relevant factors including: Root location and distribution, tree species, condition, site constraints and design factors.

The area lost to this encroachment should be compensated for elsewhere, contiguous with the TPZ.

Relocate services/pathways outside of tree protection zones

Design services to be installed at a minimum depth of 1200mm below ground to avoid impact to the root zones of trees.

Design pathways to be installed on or above grade, minimising/eliminating excavation within tree protection zones.

Design pathways using porous materials (eco-paving, porous asphalt, decomposed granite) to allow water and oxygen to reach the root zone.

Design pathway using tree sensitive techniques (pier and beam, suspended slabs).

The area lost to encroachment can be compensated for elsewhere, contiguous with the TPZ.

As above

Removal of existing hard surfaces should be undertaken manually to avoid root damage.

Tree sensitive techniques can be used to install the services: Horizontal directional drilling (HDD), boring, non-destructive excavation (NDE).

5. References

5.1 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 Bloomings 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.
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- 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.
- 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
- Standards Australia 2007. *Australian Standard: Pruning of amenity trees, AS 4373 (2007)*, Standards Australia, Sydney.
- Standards Australia 2009. *Australian Standard: Protection of trees on development sites, AS 4970 (2009)*. Standards Australia, Sydney.

5.2 Project specific references

- Architectus, *Centennial Avenue Site – Open Space Markup SK-AX-0021, Revision A*, dated 12/3/19
- Willoughby City Council, *Tree And Vegetation Preservation Clause 5.9(2) Under The WLEP 2012 and WDCP C9* dated 2012
- CMS Surveyors, *Survey Plan showing Detail and Levels over Lot 12 in DP725204 24 Centennial Avenue, Chatswood, First Issue* dated 27 February 2018

Appendix A Tree retention assessment method

A1 Tree Significance Assessment Criteria - STARS®

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

A2 Matrix assessment

		Tree significance			
		High	Medium	Low	
Useful Life Expectancy	Long >40 years				
	Medium 15-40 years				
	Short <1-15 years				
	Dead				

Legend:

	Priority for retention (High): Tree considered important so should be retained and protected. Design modification or re-location of structure should be considered to accommodate the setbacks as prescribed by the <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.
	Consider for removal (Low): Tree not considered important for retention, nor requiring special works or design modification to be implemented for their retention.

Appendix B Tree protection guidelines

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

B1 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 the commencement of works.
- Prominently signposted with 300mm x 450mm boards stating "NO ACCESS - TREE PROTECTION ZONE".

B2 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.

B3 Trunk protection

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

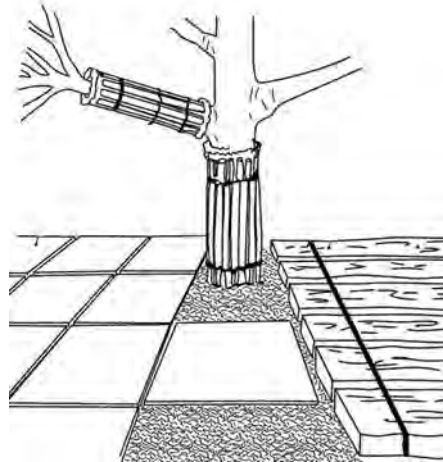
The removal of bark or branches allows the potential ingress of micro-organisms which may cause decay. Furthermore, the removal of bark restricts the trees' ability to distribute water, mineral ions (solutes), and glucose.

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

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



Tree protection fencing



Trunk protection fencing

B4 Ground protection

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

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

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

B5 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.

B6 Underground services

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

Appendix C Maps

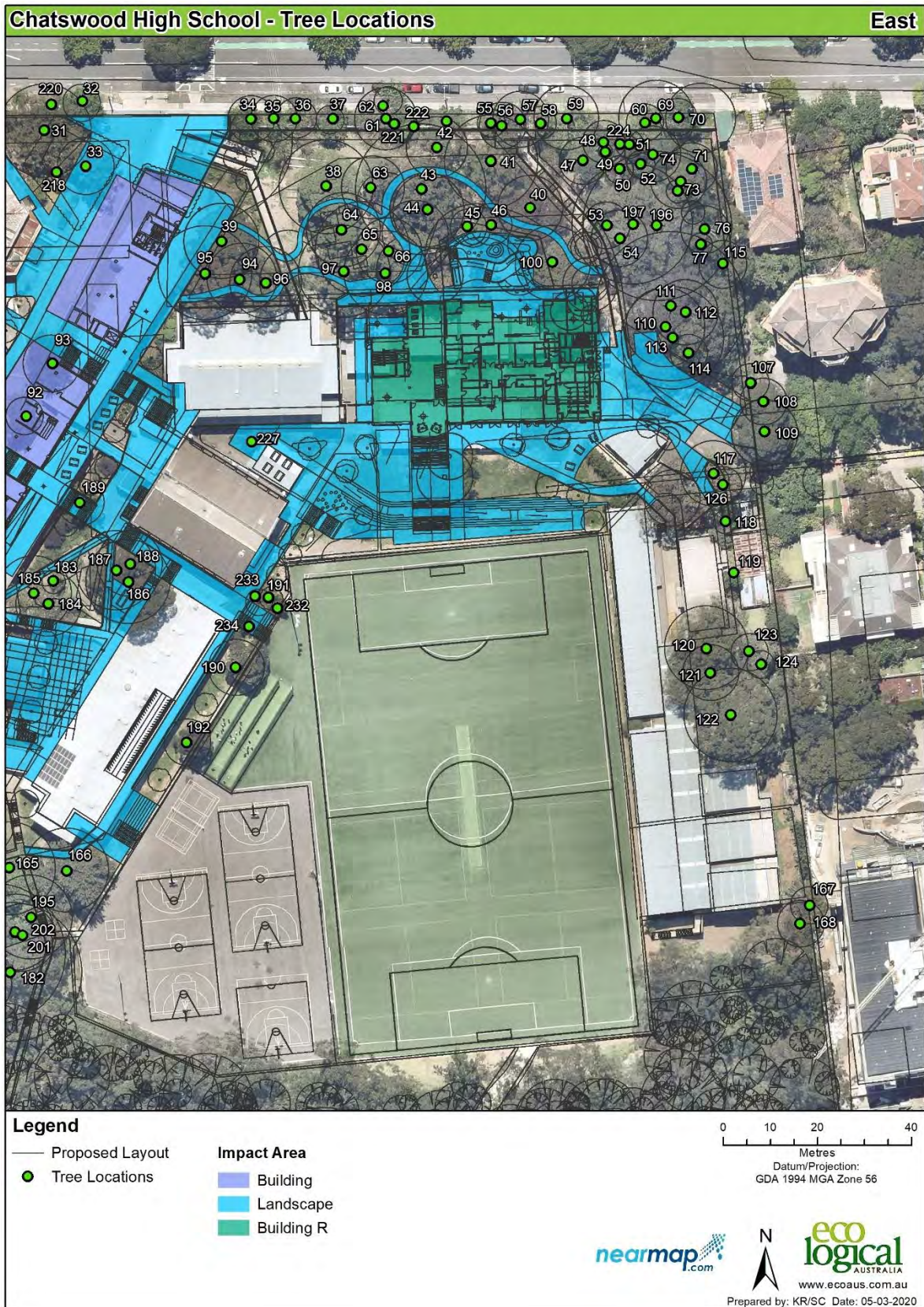


Figure 4: Tree locations of subject trees – East

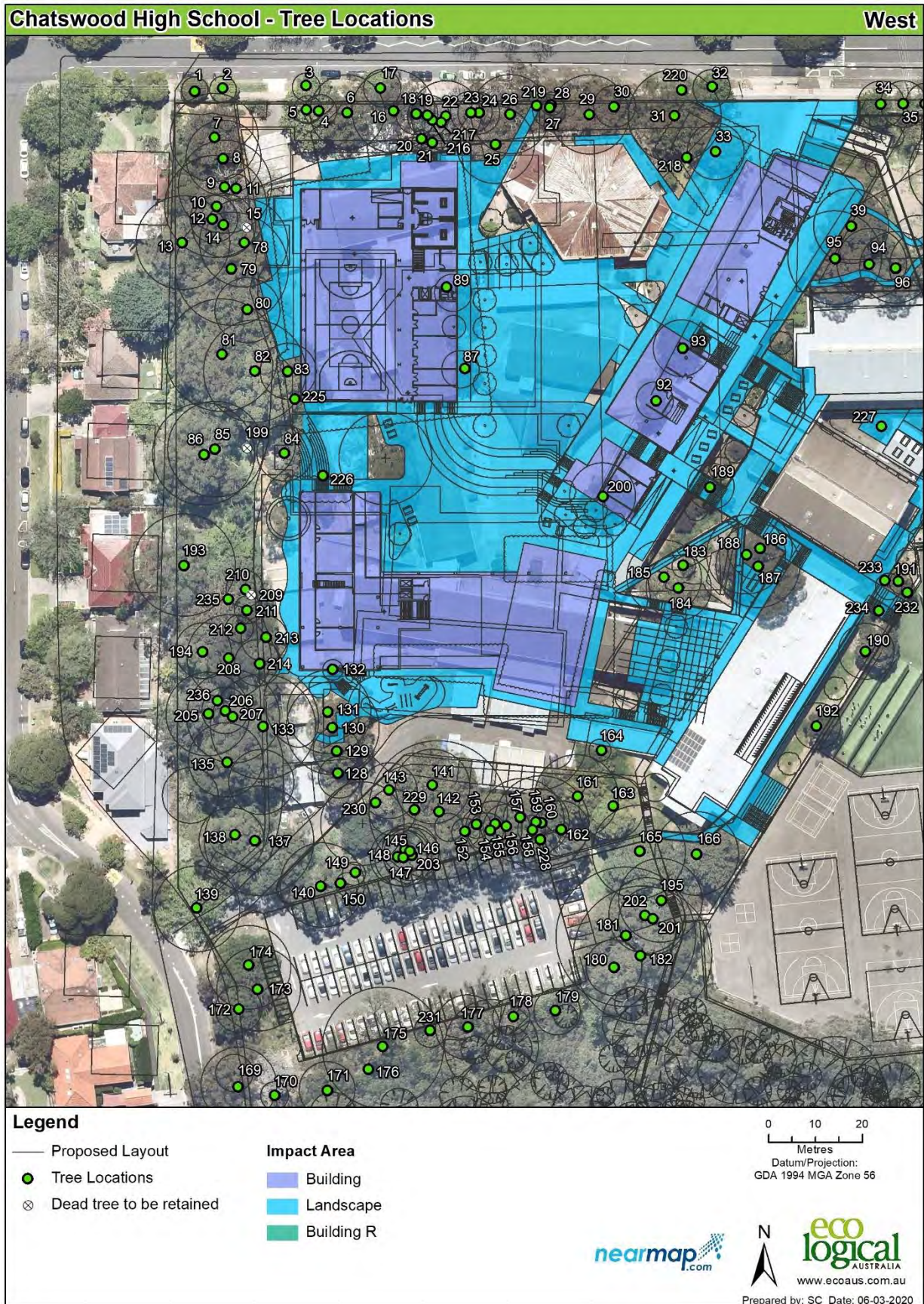


Figure 5: Tree locations of subject trees - West

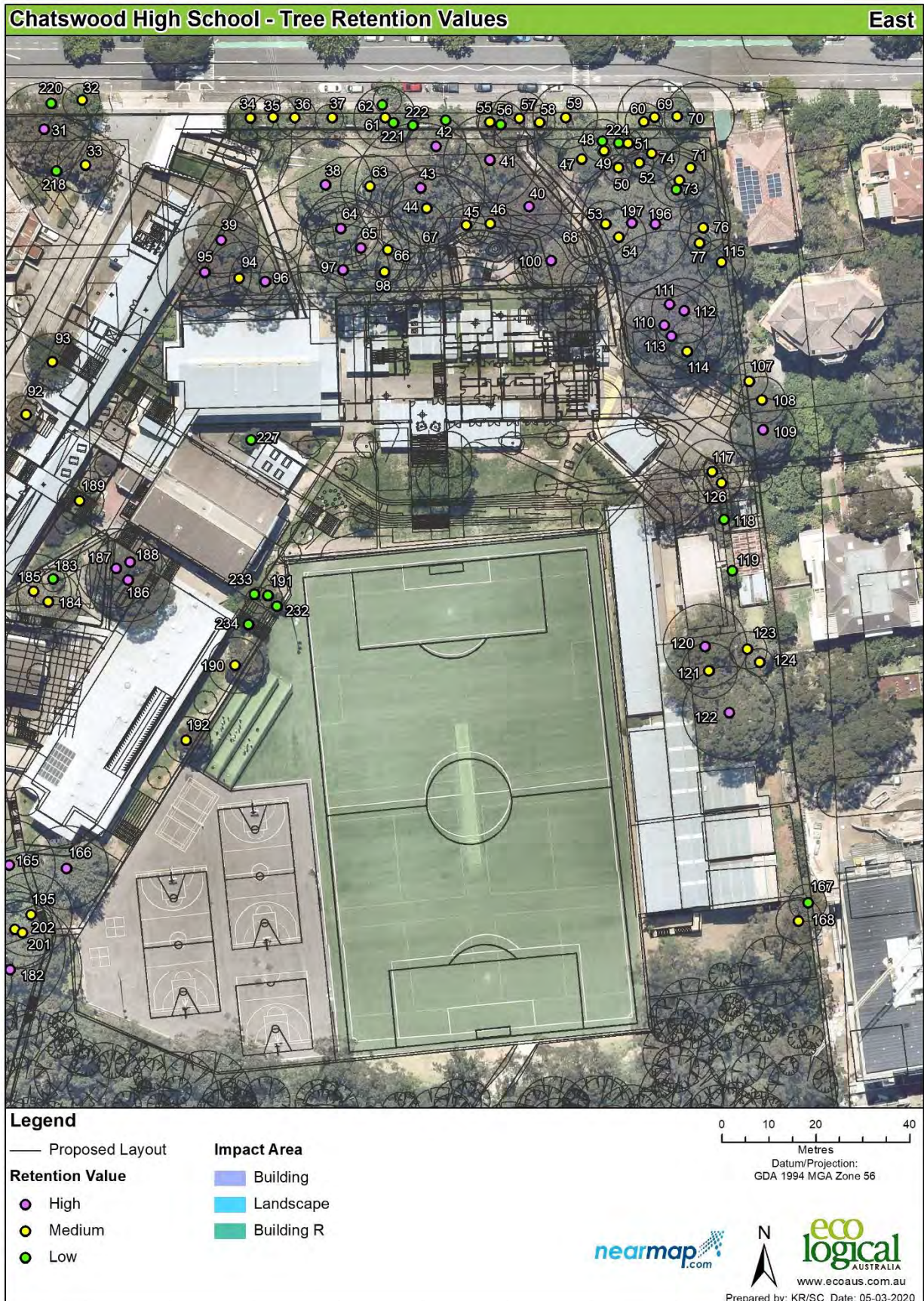


Figure 6: Retention values of subject trees – East

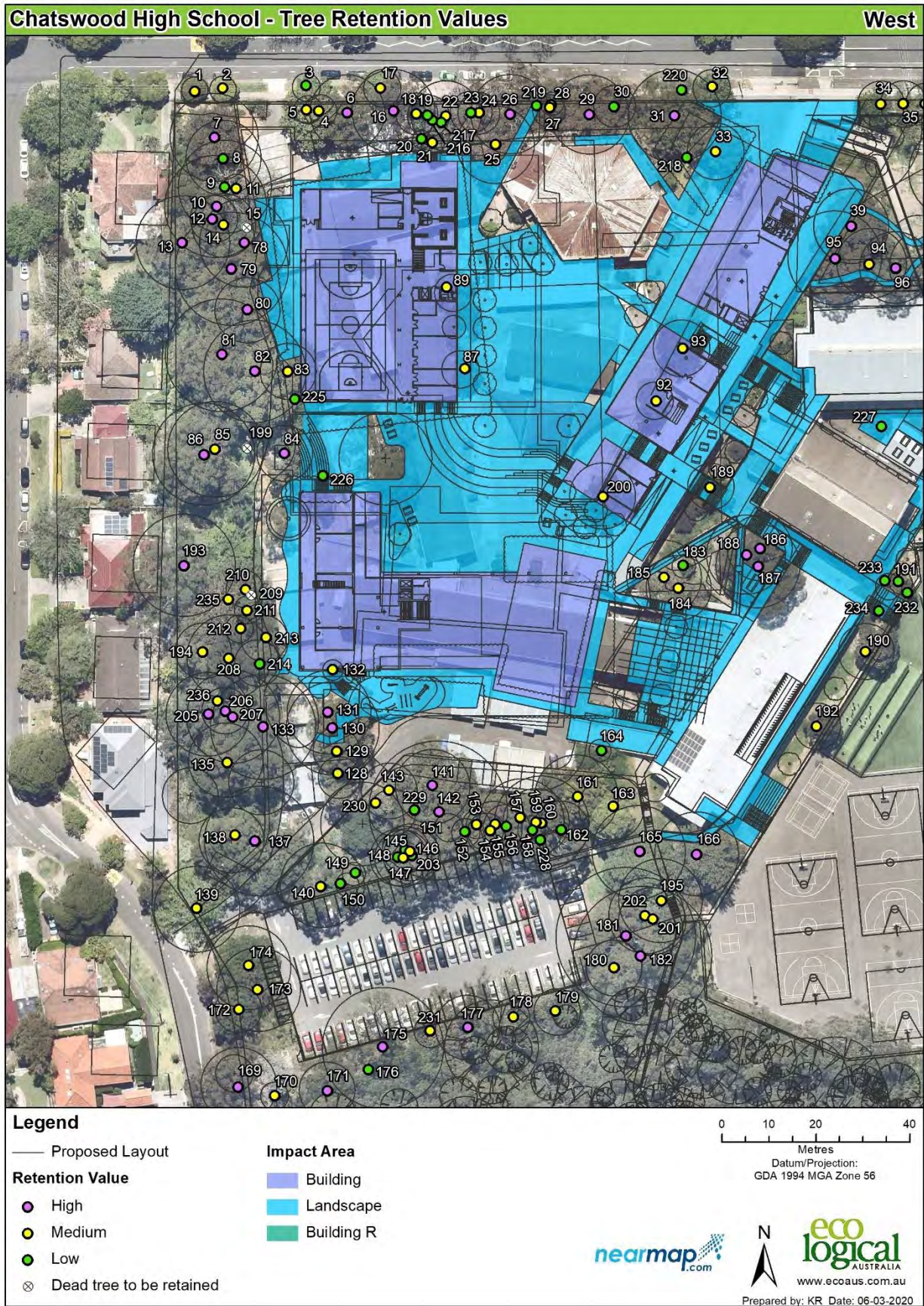


Figure 7: Retention values of subject trees - West

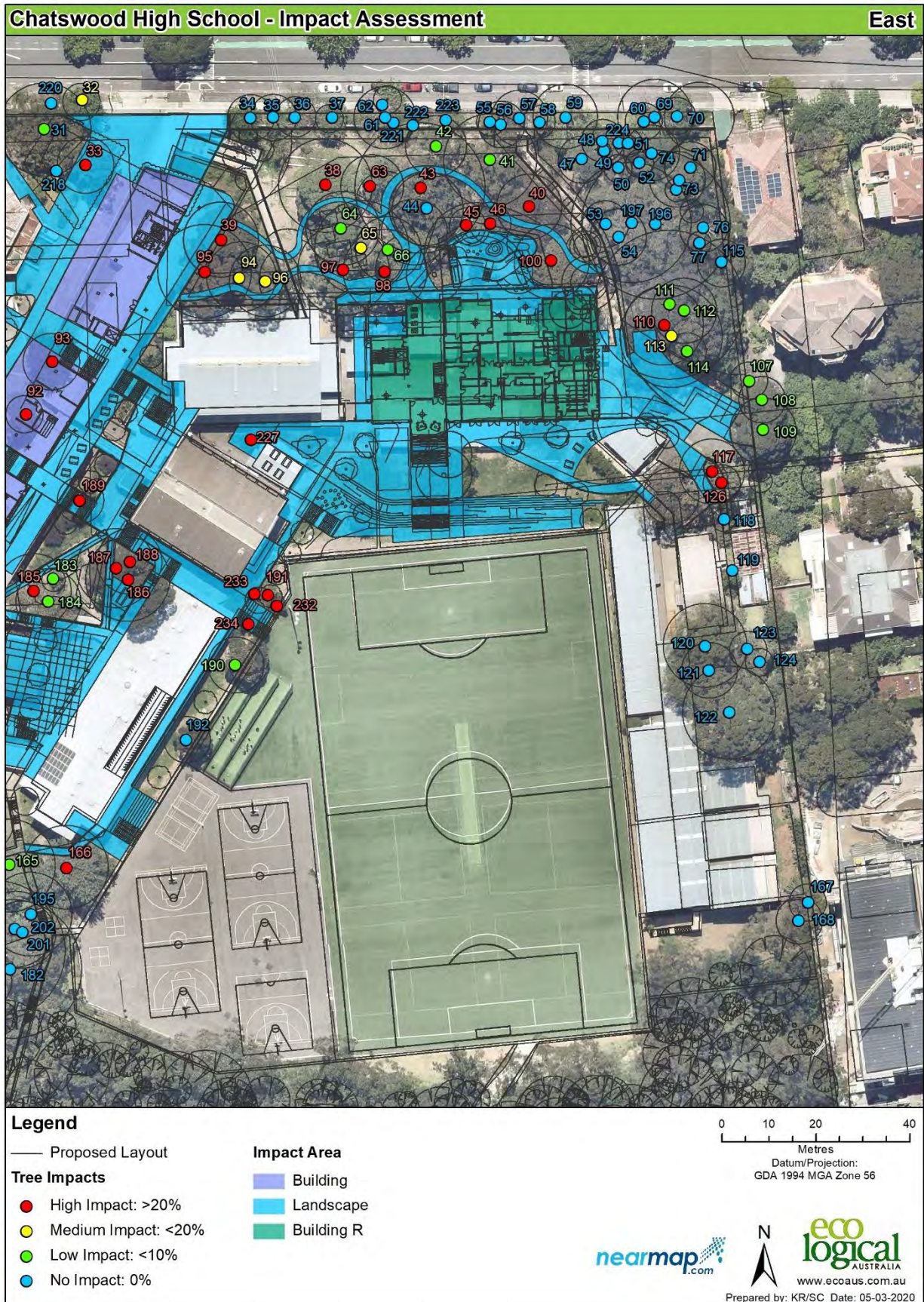


Figure 8: Arboricultural impact assessment for subject trees - East

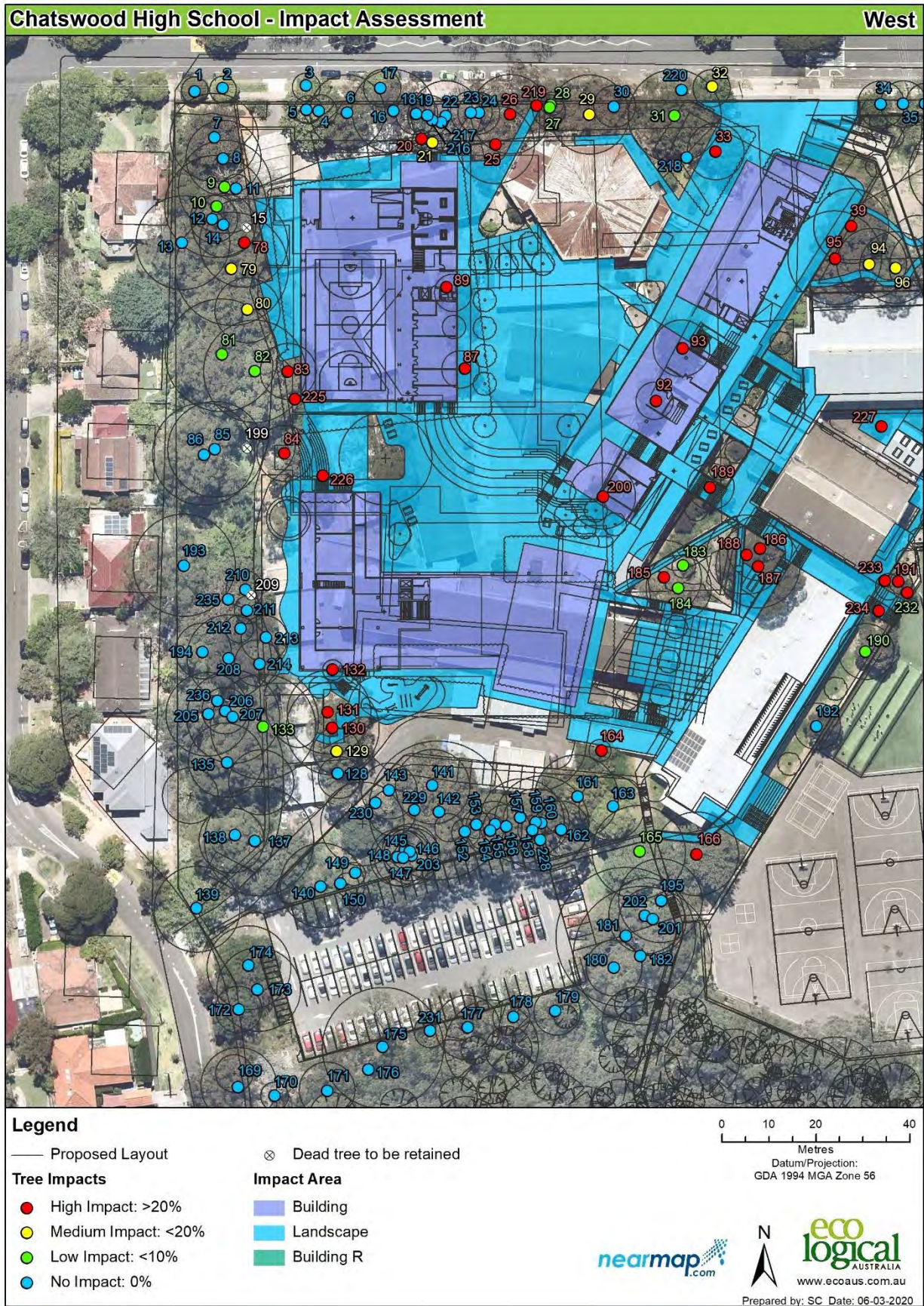


Figure 9: Arboricultural impact assessment for subject trees - West

Appendix D Tabulated arboricultural impact assessment

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
1	<i>Tristaniaopsis laurina</i>	5	5	300	Fair	Fair	Medium	3.6	2.0	No Impact: 0%	Street tree. Bifurcated trunk	Retain
2	<i>Tristaniaopsis laurina</i>	5	6	260	Poor	Fair	Medium	3.1	1.9	No Impact: 0%	Street tree	Retain
3	<i>Cinnamomum camphora</i>	7	7	400	Fair	Poor	Low	4.8	2.3	No Impact: 0%	Street tree. Lopped under power lines	Retain
4	<i>Cinnamomum camphora</i>	14	14	650	Good	Good	Medium	7.8	2.8	No Impact: 0%		Retain
5	<i>Cinnamomum camphora</i>	14	7	400	Fair	Fair	Medium	4.8	2.3	No Impact: 0%		Retain
6	<i>Eucalyptus saligna</i>	19	12	600	Fair	Good	High	7.2	2.7	No Impact: 0%		Retain
7	<i>Eucalyptus resinifera</i>	22	13	700	Fair	Fair	High	8.4	2.8	No Impact: 0%	Bifurcated trunk, decay in trunk. Other tags 113	Retain
8	<i>Pinus radiata</i>	12	14	400	Poor	Poor	Low	4.8	2.3	No Impact: 0%	Other tags 114	Retain as per section 3
9	<i>Eucalyptus paniculata</i>	20	12	900	Poor	Fair	Low	10.8	3.2	Low Impact: <10%	Ironbark almost defoliated. Other tag 15	Retain as per section 3
10	<i>Eucalyptus pilularis</i>	18	15	720	Good	Fair	High	8.6	2.9	Low Impact: <10%	Previously identified as <i>Eucalyptus saligna</i> . Other tag 116	Retain
11	<i>Angophora costata</i>	10	8	210	Fair	Fair	Medium	2.5	1.7	No Impact: 0%		Retain
12	<i>Eucalyptus pilularis</i>	25	10	530	Good	Good	High	6.4	2.5	No Impact: 0%	Other tag 117	Retain
13	<i>Eucalyptus saligna</i>	28	14	1200	Fair	Fair	High	14.4	3.6	No Impact: 0%		Retain
14	<i>Angophora costata</i>	15	10	400	Good	Good	Medium	4.8	2.3	No Impact: 0%	Previously identified as <i>Eucalyptus saligna</i> . Other tag 119	Retain
15	<i>Eucalyptus</i> sp.	15	3	700	Poor	Poor	Low				Dead stump	Retain as per section 3
16	<i>Eucalyptus saligna</i>	19	12	700	Poor	Fair	High	8.4	2.8	No Impact: 0%		Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
17	<i>Celtis australis</i>	5	8	350	Good	Fair	Medium	4.2	2.1	No Impact: 0%	Street tree	Retain
18	<i>Syncarpia glomulifera</i>	11	4	240	Good	Good	Medium	2.9	1.8	No Impact: 0%		Retain
19	<i>Syncarpia glomulifera</i>	10	3	160	Good	Good	Low	2.0	1.5	No Impact: 0%		Retain
20	<i>Syncarpia glomulifera</i>	10	4	170	Fair	Fair	Low	2.0	1.6	High Impact: >20%	Wound on lower trunk	Remove due to new stairwell construction as per section 3/4
21	<i>Syncarpia glomulifera</i>	12	4	260	Good	Good	Medium	3.1	1.9	Medium Impact: <20%	Bifurcation on upper trunk	Remove
22	<i>Eucalyptus sideroxylon</i>	12	10	440	Fair	Good	Medium	5.3	2.3	No Impact: 0%		Retain
23	<i>Acacia sp.</i>	6	2	100	Good	Good	Low	2.0	1.5	No Impact: 0%	Previously identified as <i>Syncarpia glomulifera</i>	Retain
24	<i>Eucalyptus scoparia</i>	15	14	480	Fair	Fair	Medium	5.8	2.4	No Impact: 0%		Retain
25	<i>Eucalyptus scoparia</i>	16	15	570	Fair	Good	Medium	6.8	2.6	High Impact: >20%		Retain as per section 3/4
26	<i>Corymbia citriodora</i>	18	18	570	Good	Good	High	6.8	2.6	High Impact: >20%		Retain as per section 3/4
27	<i>Corymbia citriodora</i>	14	5	220	Good	Good	Medium	2.6	1.8	Low Impact: <10%		Retain
28	<i>Corymbia citriodora</i>	15	5	230	Good	Good	Medium	2.8	1.8	Low Impact: <10%		Retain
29	<i>Corymbia citriodora</i>	17	19	710	Good	Good	High	8.5	2.9	Medium Impact: <20%		Retain
30	<i>Corymbia citriodora</i>	12	8	170	Fair	Fair	Low	2.0	1.6	No Impact: 0%		Retain
31	<i>Eucalyptus saligna</i>	22	22	780	Good	Good	High	9.4	3.0	Low Impact: <10%		Retain
32	<i>Liquidambar styraciflua</i>	12	11	490	Good	Fair	Medium	5.9	2.5	Medium Impact: <20%	Street tree, lopped around power lines	Retain as per section 3/4
33	<i>Eucalyptus saligna</i>	23	12	490	Good	Good	Medium	5.9	2.5	High Impact: >20%		Remove
34	<i>Liquidambar styraciflua</i>	12	10	350	Fair	Fair	Medium	4.2	2.1	No Impact: 0%		Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
35	<i>Ulmus parvifolia</i>	11	15	450	Good	Fair	Medium	5.4	2.4	No Impact: 0%		Retain
36	<i>Jacaranda mimosifolia</i>	10	8	350	Fair	Fair	Medium	4.2	2.1	No Impact: 0%		Retain
37	<i>Lagerstroemia indica</i>	6	6	200	Fair	Fair	Medium	2.4	1.7	No Impact: 0%		Retain
38	<i>Lophostemon confertus</i>	24	16	1030	Fair	Fair	High	12.4	3.4	High Impact: >20%	Other tags 7, 61	Retain as per section 3/4
39	<i>Eucalyptus microcorys</i>	22	15	670	Good	Good	High	8.0	2.8	High Impact: >20%		Retain as per section 3/4
40	<i>Eucalyptus paniculata</i>	24	18	740	Good	Good	High	8.9	2.9	High Impact: >20%	Other tags 26, 45	Retain as per section 3/4
41	<i>Eucalyptus grandis</i>	25	18	550	Good	Good	High	6.6	2.6	Low Impact: <10%	Other tags 46, 21	Retain
42	<i>Eucalyptus grandis</i>	25	15	500	Good	Good	High	6.0	2.5	Low Impact: <10%	Other tags 47, 20	Retain
43	<i>Eucalyptus saligna</i>	28	25	1000	Good	Fair	High	12.0	3.3	High Impact: >20%	Wound on trunk, Other tags 48, 19	Retain as per section 3/4
44	<i>Cinnamomum camphora</i>	12	16	500	Good	Fair	Medium	6.0	2.5	No Impact: 0%	Other tags 49, 18	Retain
45	<i>Eucalyptus grandis</i>	30	8	350	Fair	Fair	Medium	4.2	2.1	High Impact: >20%		Remove
46	<i>Eucalyptus paniculata</i>	16	12	280	Good	Good	Medium	3.4	1.9	High Impact: >20%		Remove
47	<i>Eucalyptus saligna</i>	18	8	400	Good	Good	Medium	4.8	2.3	No Impact: 0%	Other tags 38, 62	Retain
48	<i>Eucalyptus saligna</i>	13	4	200	Fair	Fair	Low	2.4	1.7	No Impact: 0%	Other tags 37, 67	Retain
49	<i>Eucalyptus saligna</i>	15	3	220	Good	Fair	Medium	2.6	1.8	No Impact: 0%	Other tags 36, 66	Retain
50	<i>Eucalyptus saligna</i>	14	4	300	Poor	Fair	Medium	3.6	2.0	No Impact: 0%		Retain
51	<i>Eucalyptus saligna</i>	19	5	320	Good	Good	Medium	3.8	2.1	No Impact: 0%	Other tags 34, 70	Retain
52	<i>Eucalyptus saligna</i>	17	4	280	Good	Good	Medium	3.4	1.9	No Impact: 0%	Other tags 33, 77	Retain
53	<i>Eucalyptus pilularis</i>	13	6	280	Fair	Fair	Medium	3.4	1.9	No Impact: 0%	Other tags 28, 91	Retain
54	<i>Eucalyptus resinifera</i>	13	8	350	Fair	Fair	Medium	4.2	2.1	No Impact: 0%	Other tags 27, 92	Retain
55	<i>Callistemon salignus</i>	10	5	220	Fair	Fair	Medium	2.6	1.8	No Impact: 0%		Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
56	<i>Callistemon salignus</i>	8	5	180	Fair	Fair	Low	2.2	1.6	No Impact: 0%		Retain
57	<i>Jacaranda mimosifolia</i>	11	9	360	Fair	Fair	Medium	4.3	2.2	No Impact: 0%	Multiple trunks	Retain
58	<i>Callistemon salignus</i>	11	5	300	Good	Fair	Medium	3.6	2.0	No Impact: 0%		Retain
59	<i>Ulmus parvifolia</i>	12	10	500	Fair	Fair	Medium	6.0	2.5	No Impact: 0%		Retain
60	<i>Lagerstroemia indica</i>	8	7	250	Fair	Fair	Medium	3.0	1.8	No Impact: 0%		Retain
61	<i>Jacaranda mimosifolia</i>	14	15	509	Fair	Fair	Medium	6.1	2.5	No Impact: 0%		Retain
62	<i>Platanus × acerifolia</i>	6	6	300	Poor	Poor	Low	3.6	2.0	No Impact: 0%	Street tree	Retain
63	<i>Lophostemon confertus</i>	16	10	530	Poor	Fair	Medium	6.4	2.5	High Impact: >20%	Other tags 8, 60	Retain as per section 3/4
64	<i>Eucalyptus saligna</i>	28	10	520	Good	Good	High	6.2	2.5	Low Impact: <10%	Other tags 9, 59	Retain
65	<i>Eucalyptus saligna</i>	30	12	700	Good	Good	High	8.4	2.8	Medium Impact: <20%	Other tags 57, 11	Retain as per section 3/4
66	<i>Eucalyptus saligna</i>	18	9	320	Fair	Fair	Medium	3.8	2.1	Low Impact: <10%	Other tags 56, 13	Retain
69	<i>Jacaranda mimosifolia</i>	12	13	500	Fair	Fair	Medium	6.0	2.5	No Impact: 0%		Retain
70	<i>Calodendron capense</i>	6	7	220	Fair	Fair	Medium	2.6	1.8	No Impact: 0%		Retain
71	<i>Eucalyptus saligna</i>	17	9	380	Fair	Fair	Medium	4.6	2.2	No Impact: 0%	Other tags 31, 80, decay in lower trunk	Retain
72	<i>Eucalyptus saligna</i>	22	7	320	Good	Good	Medium	3.8	2.1	No Impact: 0%		Retain
73	<i>Eucalyptus saligna</i>	12	6	150	Fair	Fair	Low	2.0	1.5	No Impact: 0%	Other tags 29	Retain
74	<i>Eucalyptus saligna</i>	20	10	390	Good	Good	Medium	4.7	2.2	No Impact: 0%	Other tags 32, 78	Retain
76	<i>Eucalyptus saligna</i>	20	12	350	Fair	Fair	Medium	4.2	2.1	No Impact: 0%	Other tags 23, 151	Retain
77	<i>Eucalyptus saligna</i>	15	5	280	Good	Good	Medium	3.4	1.9	No Impact: 0%	Other tags 22, 152	Retain
78	<i>Eucalyptus pilularis</i>	22	16	720	Fair	Fair	High	8.6	2.9	High Impact: >20%	Wound on trunk. Other tag 121	Retain as per section 3
79	<i>Eucalyptus pilularis</i>	25	20	900	Good	Fair	High	10.8	3.2	Medium Impact: <20%	Other tag 122	Retain as per section 3

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
80	<i>Casuarina cunninghamiana</i>	18	18	650	Good	Fair	High	7.8	2.8	Medium Impact: <20%	Previously identified as C.glauca. Other tag 123	Retain as per section 3
81	<i>Eucalyptus saligna</i>	32	25	1115	Good	Fair	High	13.4	3.5	Low Impact: <10%	Other tag 124	Retain
82	<i>Angophora costata</i>	25	20	820	Good	Good	High	9.8	3.0	Low Impact: <10%		Retain
83	<i>Celtis sinensis</i>	18	16	600	Good	Fair	Medium	7.2	2.7	High Impact: >20%	Other tag 126	Remove
84	<i>Angophora costata</i>	25	20	850	Fair	Fair	High	10.2	3.1	High Impact: >20%		Retain See section 3/4
85	<i>Eucalyptus saligna</i>	18	20	500	Fair	Fair	Medium	6.0	2.5	No Impact: 0%	Other tag 128	Retain
86	<i>Eucalyptus saligna</i>	28	25	900	Fair	Fair	High	10.8	3.2	No Impact: 0%	Other tag 129. Burls on scaffolds	Retain
87	<i>Callistemon salignus</i>	12	7	300	Fair	Fair	Medium	3.6	2.0	High Impact: >20%	Other tag 89	Remove
89	<i>Callistemon viminalis</i>	7	10	450	Fair	Fair	Medium	5.4	2.4	High Impact: >20%	Kids swing on low limb with inclusion	Remove
92	<i>Casuarina cunninghamiana</i>	14	10	350	Good	Good	Medium	4.2	2.1	High Impact: >20%	Other tag 87	Remove
93	<i>Casuarina cunninghamiana</i>	17	10	600	Good	Fair	Medium	7.2	2.7	High Impact: >20%	Other tag 86	Remove
94	<i>Syzygium paniculatum</i>	14	15	390	Fair	Fair	Medium	4.7	2.2	Medium Impact: <20%	Listed as Eucalyptus saligna. Bifurcated trunk	Remove
95	<i>Eucalyptus saligna</i>	28	15	700	Good	Good	High	8.4	2.8	High Impact: >20%	Listed as E. microcorys	Retain See section 3/4
96	<i>Eucalyptus saligna</i>	30	15	680	Fair	Fair	High	8.2	2.8	Medium Impact: <20%		Retain as per section 3/4
97	<i>Eucalyptus saligna</i>	22	10	540	Good	Fair	High	6.5	2.6	High Impact: >20%	Other tags 58, 10	Retain as per section 3/4
98	<i>Eucalyptus microcorys</i>	18	12	400	Good	Good	Medium	4.8	2.3	High Impact: >20%	Other tags 55, 12	Remove
100	<i>Eucalyptus paniculata</i>	25	18	759	Good	Good	High	9.1	2.9	High Impact: >20%	Other tags 28, 44	Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
as per section 3/4												
107	<i>Jacaranda mimosifolia</i>	14	10	450	Fair	Poor	Medium	5.4	2.4	Low Impact: <10%	On adjacent property. Decay in trunk	Retain
108	<i>Eucalyptus saligna</i>	20	10	500	Good	Good	Medium	6.0	2.5	Low Impact: <10%	On adjacent prooerty	Retain
109	<i>Eucalyptus saligna</i>	20	12	600	Good	Good	High	7.2	2.7	Low Impact: <10%	On adjacent property	Retain
110	<i>Eucalyptus saligna</i>	25	15	550	Good	Fair	High	6.6	2.6	High Impact: >20%	Other tags 18, 97	Retain as per section 3/4
111	<i>Eucalyptus saligna</i>	34	16	900	Good	Good	High	10.8	3.2	Low Impact: <10%	Other tags 19, 96, 155	Retain
112	<i>Eucalyptus saligna</i>	32	16	750	Good	Good	High	9.0	2.9	Low Impact: <10%	Other tags 20, 100	Retain
113	<i>Eucalyptus saligna</i>	22	12	500	Fair	Fair	High	6.0	2.5	Medium Impact: <20%	Other tags 17, 99, 152	Retain as per section 3/4
114	<i>Casuarina glauca</i>	10	8	350	Fair	Fair	Medium	4.2	2.1	Low Impact: <10%	Other tags 16, 101	Retain
115	<i>Eucalyptus saligna</i>	20	10	320	Good	Good	Medium	3.8	2.1	No Impact: 0%	Other tags 21, 153	Retain
117	<i>Corymbia maculata</i>	15	10	600	Fair	Fair	Medium	7.2	2.7	High Impact: >20%	Other tag 104	Retain as per section 3/4
118	<i>Callistemon viminalis</i>	6	6	250	Fair	Fair	Low	3.0	1.8	No Impact: 0%	Other tag 108	Retain
119	<i>Stenocarpus sinuatus</i>	10	5	220	Fair	Fair	Low	2.6	1.8	No Impact: 0%		Retain
120	<i>Eucalyptus saligna</i>	20	16	670	Good	Fair	High	8.0	2.8	No Impact: 0%		Retain
121	<i>Eucalyptus saligna</i>	18	16	550	Fair	Fair	Medium	6.6	2.6	No Impact: 0%		Retain
122	<i>Eucalyptus saligna</i>	25	22	750	Fair	Fair	High	9.0	2.9	No Impact: 0%		Retain
123	<i>Melaleuca linariifolia</i>	9	5	330	Fair	Fair	Medium	4.0	2.1	No Impact: 0%		Retain
124	<i>Melaleuca quinquenervia</i>	12	5	300	Fair	Fair	Medium	3.6	2.0	No Impact: 0%		Retain
126	<i>Melaleuca styphelioides</i>	10	6	400	Fair	Fair	Medium	4.8	2.3	High Impact: >20%	Other tags 2, 105, bifurcation	Remove
128	<i>Eucalyptus punctata</i>	16	8	300	Fair	Fair	Medium	3.6	2.0	No Impact: 0%	Other tags 159	Retain
129	<i>Eucalyptus paniculata</i>	16	10	310	Good	Good	Medium	3.7	2.0	Medium Impact: <20%	Other tags 158	Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
as per section 3/4												
130	<i>Eucalyptus grandis</i>	28	10	529	Good	Good	High	6.3	2.5	High Impact: >20%	Other tags 157	Retain as per section 3/4
131	<i>Eucalyptus grandis</i>	29	10	570	Good	Good	High	6.8	2.6	High Impact: >20%		Retain as per section 3/4
132	<i>Araucaria columnaris</i>	16	3	320	Good	Good	Medium	3.8	2.1	High Impact: >20%	Other tags 155	Remove
133	<i>Eucalyptus pilularis</i>	28	22	900	Good	Fair	High	10.8	3.2	Low Impact: <10%	Other tags 142	Retain
135	<i>Eucalyptus saligna</i>	20	12	509	Good	Good	Medium	6.1	2.5	No Impact: 0%		Retain
137	<i>Angophora costata</i>	22	20	950	Good	Good	High	11.4	3.2	No Impact: 0%		Retain
138	<i>Eucalyptus saligna</i>	20	12	400	Good	Good	Medium	4.8	2.3	No Impact: 0%		Retain
139	<i>Liquidambar styraciflua</i>	12	12	650	Fair	Fair	Medium	7.8	2.8	No Impact: 0%	Other tags 151	Retain
140	<i>Angophora costata</i>	18	10	480	Good	Good	Medium	5.8	2.4	No Impact: 0%	Other tags 160	Retain
141	<i>Angophora costata</i>	25	25	1000	Fair	Fair	High	12.0	3.3	No Impact: 0%	Other tags 169. Basal wound, borers	Retain
142	<i>Eucalyptus pilularis</i>	28	25	1200	Good	Good	High	14.4	3.6	No Impact: 0%	Other tags 168	Retain
143	<i>Harpephyllum caffrum</i>	9	16	550	Fair	Fair	Medium	6.6	2.6	No Impact: 0%	Other tags 163	Retain
145	<i>Angophora costata</i>	13	5	200	Fair	Fair	Low	2.4	1.7	No Impact: 0%		Retain
146	<i>Angophora costata</i>	14	7	300	Fair	Fair	Medium	3.6	2.0	No Impact: 0%	Other tags 167	Retain
147	<i>Angophora costata</i>	12	10	350	Fair	Fair	Medium	4.2	2.1	No Impact: 0%	Leaning	Retain
148	<i>Angophora costata</i>	10	5	180	Fair	Fair	Low	2.2	1.6	No Impact: 0%		Retain
149	<i>Angophora costata</i>	14	6	250	Fair	Fair	Low	3.0	1.8	No Impact: 0%		Retain
150	<i>Angophora costata</i>	12	5	220	Fair	Fair	Low	2.6	1.8	No Impact: 0%		Retain
152	<i>Angophora costata</i>	11	5	200	Good	Good	Low	2.4	1.7	No Impact: 0%	Other tags 171	Retain
153	<i>Eucalyptus pilularis</i>	20	6	320	Good	Good	Medium	3.8	2.1	No Impact: 0%	Other tags 172	Retain
154	<i>Eucalyptus pilularis</i>	20	8	300	Good	Good	Medium	3.6	2.0	No Impact: 0%	Other tags 173	Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
155	<i>Eucalyptus pilularis</i>	18	7	300	Good	Fair	Medium	3.6	2.0	No Impact: 0%		Retain
156	<i>Angophora costata</i>	10	6	220	Fair	Fair	Low	2.6	1.8	No Impact: 0%		Retain
157	<i>Eucalyptus pilularis</i>	22	10	420	Good	Good	Medium	5.0	2.3	No Impact: 0%	Other tags 176	Retain
158	<i>Eucalyptus pilularis</i>	16	5	220	Fair	Fair	Low	2.6	1.8	No Impact: 0%	Other tags 177	Retain
159	<i>Angophora costata</i>	15	6	340	Fair	Fair	Medium	4.1	2.1	No Impact: 0%		Retain
160	<i>Angophora costata</i>	18	10	500	Good	Fair	Medium	6.0	2.5	No Impact: 0%	One extended limb	Retain
161	<i>Syzygium paniculatum</i>	14	20	500	Good	Good	Medium	6.0	2.5	No Impact: 0%	Other tags 181	Retain
162	<i>Harpephyllum caffrum</i>	15	14	320	Good	Good	Low	3.8	2.1	No Impact: 0%	Other tags 180	Retain
163	<i>Lophostemon confertus</i>	15	10	420	Good	Fair	Medium	5.0	2.3	No Impact: 0%	Other tags 182. Bifurcation	Retain
164	<i>Syncarpia glomulifera</i>	8	4	220	Fair	Fair	Low	2.6	1.8	High Impact: >20%	Other tags 183	Retain as per section 3/4
165	<i>Lophostemon confertus</i>	20	18	900	Good	Good	High	10.8	3.2	Low Impact: <10%		Retain
166	<i>Syncarpia glomulifera</i>	20	20	1400	Good	Fair	High	15.0	3.8	High Impact: >20%		Retain as per section 3/4
167	<i>Phoenix canariensis</i>	5	8	800	Good	Good	Low	9.6	3.0	No Impact: 0%	Possibly self sown	Retain
168	<i>Jacaranda mimosifolia</i>	11	10	450	Good	Good	Medium	5.4	2.4	No Impact: 0%		Retain
169	<i>Eucalyptus saligna</i> <i>Xbotryoides</i>	19	20	800	Good	Good	High	9.6	3.0	No Impact: 0%		Retain
170	<i>Eucalyptus paniculata</i>	16	7	300	Fair	Fair	Medium	3.6	2.0	No Impact: 0%		Retain
171	<i>Eucalyptus amplifolia</i>	20	17	1000	Fair	Poor	High	12.0	3.3	No Impact: 0%	Decay in trunk	Retain
172	<i>Angophora costata</i>	14	9	320	Good	Good	Medium	3.8	2.1	No Impact: 0%		Retain
173	<i>Angophora costata</i>	11	11	339	Fair	Fair	Medium	4.1	2.1	No Impact: 0%		Retain
174	<i>Harpephyllum caffrum</i>	10	14	500	Good	Fair	Medium	6.0	2.5	No Impact: 0%	Other tags 152	Retain
175	<i>Eucalyptus amplifolia</i>	26	18	1000	Fair	Fair	High	12.0	3.3	No Impact: 0%	Other tags 197	Retain
176	<i>Brachychiton acerifolius</i>	8	4	200	Fair	Fair	Low	2.4	1.7	No Impact: 0%		Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
177	<i>Eucalyptus pilularis</i>	18	14	800	Fair	Fair	High	9.6	3.0	No Impact: 0%	Other tags 195	Retain
178	<i>Grevillea robusta</i>	18	10	400	Good	Good	Medium	4.8	2.3	No Impact: 0%	Other tags 194	Retain
179	<i>Grevillea robusta</i>	16	10	300	Good	Good	Medium	3.6	2.0	No Impact: 0%	Other tags 193	Retain
180	<i>Eucalyptus saligna</i>	15	13	300	Fair	Fair	Medium	3.6	2.0	No Impact: 0%		Retain
181	<i>Eucalyptus saligna</i>	35	15	900	Fair	Fair	High	10.8	3.2	No Impact: 0%		Retain
182	<i>Eucalyptus saligna</i>	25	12	700	Fair	Fair	High	8.4	2.8	No Impact: 0%	Other tags 191, 13	Retain
183	<i>Stenocarpus sinuatus</i>	5	3	150	Fair	Fair	Low	2.0	1.5	Low Impact: <10%		Retain
184	<i>Eucalyptus tereticornis</i>	12	10	350	Fair	Poor	Medium	4.2	2.1	Low Impact: <10%	Wound on trunk and low fork	Retain as per section 3
185	<i>Eucalyptus tereticornis</i>	20	14	450	Fair	Fair	Medium	5.4	2.4	High Impact: >20%	Stripping of bark	Retain as per section 3/4
186	<i>Eucalyptus punctata</i>	25	15	620	Fair	Fair	High	7.4	2.7	High Impact: >20%	Other tag 69	Retain as per section 3/4
187	<i>Eucalyptus punctata</i>	25	12	570	Fair	Fair	High	6.8	2.6	High Impact: >20%	Other tag 68	Retain as per section 3/4
188	<i>Eucalyptus tereticornis</i>	24	8	500	Fair	Fair	High	6.0	2.5	High Impact: >20%	Other tag 67	Retain as per section 3/4
189	<i>Stenocarpus sinuatus</i>	8	7	350	Fair	Fair	Medium	4.2	2.1	High Impact: >20%	Other tag 66	Remove
190	<i>Eucalyptus microcorys</i>	12	9	400	Fair	Poor	Medium	4.8	2.3	Low Impact: <10%	Tree has moved. Probably stabilised and self-correcting	Retain as per section 3/4
191	<i>Acacia sp.</i>	15	6	300	Poor	Fair	Low	3.6	2.0	High Impact: >20%	Other tag 11	Remove
192	<i>Eucalyptus microcorys</i>	14	8	320	Fair	Fair	Medium	3.8	2.1	No Impact: 0%		Retain
193	<i>Eucalyptus pilularis</i>	25	20	1000	Fair	Fair	High	12.0	3.3	No Impact: 0%	Other tag 132	Retain
194	<i>Eucalyptus paniculata</i>	25	10	500	Fair	Fair	Medium	6.0	2.5	No Impact: 0%	In dense Lantana	Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
195	<i>Grevillea robusta</i>	20	12	400	Fair	Fair	Medium	4.8	2.3	No Impact: 0%	Other tag 187, bifurcated forks	Retain
196	<i>Eucalyptus saligna</i>	28	18	1050	Fair	Fair	High	12.6	3.4	No Impact: 0%	Other tags 25, 94	Retain
197	<i>Eucalyptus sideroxylon</i>	24	25	800	Good	Good	High	9.6	3.0	No Impact: 0%	Other tags 26, 93	Retain
199	<i>Eucalyptus sp.</i>	12	3	790	Poor	Poor				Dead	Dead stump. Other tag 127	Retain as per section 3
200	<i>Casuarina cunninghamiana</i>	16	11	550	Fair	Fair	Medium	6.6	2.6	High Impact: >20%	Dead tree	Remove
201	<i>Eucalyptus saligna</i>	15	10	320	Fair	Fair	Medium	3.8	2.1	No Impact: 0%	Other tag 188	Retain
202	<i>Eucalyptus saligna</i>	22	16	450	Fair	Fair	Medium	5.4	2.4	No Impact: 0%	Other tag 189	Retain
203	<i>Eucalyptus pilularis</i>	10	5	150	Good	Good	Low	2.0	1.5	No Impact: 0%		Retain
205	<i>Eucalyptus paniculata</i>	28	15	609	Fair	Fair	High	7.3	2.7	No Impact: 0%	In dense Lantana	Retain
206	<i>Angophora costata</i>	22	12	600	Fair	Fair	High	7.2	2.7	No Impact: 0%	In dense Lantana	Retain
207	<i>Eucalyptus pilularis</i>	28	18	650	Fair	Fair	High	7.8	2.8	No Impact: 0%	In dense Lantana	Retain
208	<i>Eucalyptus pilularis</i>	20	12	450	Fair	Fair	Medium	5.4	2.4	No Impact: 0%	In dense Lantana	Retain
209	<i>Eucalyptus pilularis</i>	10	1	800	Poor	Poor				Dead	In dense Lantana, dead stump with fig	Retain as per section 3
210	<i>Eucalyptus pilularis</i>	12	10	320	Fair	Fair	Medium	3.8	2.1	No Impact: 0%	In dense Lantana	Retain
211	<i>Eucalyptus paniculata</i>	12	10	350	Fair	Fair	Medium	4.2	2.1	No Impact: 0%	In dense Lantana	Retain
212	<i>Eucalyptus sp</i>	10	11	300	Good	Fair	Medium	3.6	2.0	No Impact: 0%		Retain
213	<i>Eucalyptus pilularis</i>	25	12	380	Fair	Fair	Medium	4.6	2.2	No Impact: 0%	Other tag 140, In dense Lantana	Retain
214	<i>Eucalyptus paniculata</i>	14	10	250	Fair	Fair	Low	3.0	1.8	No Impact: 0%	In dense Lantana	Retain
216	<i>Syncarpia glomulifera</i>	9	3	120	Good	Good	Low	2.0	1.5	No Impact: 0%		Retain
217	<i>Syncarpia glomulifera</i>	9	4	180	Fair	Fair	Low	2.2	1.6	No Impact: 0%	Multiple trunks	Retain
218	<i>Tristaniopsis laurina</i>	5	5	150	Fair	Fair	Low	2.0	1.5	No Impact: 0%		Retain

Tree	Botanical Name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	Retention Value	TPZ (mm)	SRZ (mm)	Impacts	Notes	Proposed action
219	<i>Corymbia citriodora</i>	10	4	100	Fair	Fair	Low	2.0	1.5	High Impact: >20%	Line of 34 semi mature trees	Remove
220	<i>Celtis sinensis</i>	4	4	160	Fair	Poor	Low	2.0	1.5	No Impact: 0%	Street tree	Retain
221	<i>Lagerstroemia indica</i>	5	4	180	Fair	Fair	Low	2.2	1.6	No Impact: 0%		Retain
222	<i>Acacia sp.</i>	9	3	100	Fair	Fair	Low	2.0	1.5	No Impact: 0%	Multiple trunks	Retain
223	<i>Ulmus parvifolia</i>	5	6	100	Fair	Poor	Low	2.0	1.5	No Impact: 0%	Regrowth from old stump	Retain
224	<i>Syncarpia glomulifera</i>	7	3	150	Good	Good	Low	2.0	1.5	No Impact: 0%	Other tags 69	Retain
225	<i>Brachychiton acerifolius</i>	6	4	120	Fair	Fair	Low	2.0	1.5	High Impact: >20%		Remove
226	<i>Acacia sp.</i>	8	6	150	Good	Good	Low	2.0	1.5	High Impact: >20%		Remove
227	<i>Ficus rubiginosa</i>	6	4	220	Good	Good	Low	2.6	1.8	High Impact: >20%	Possibly self sown. Removal is recommended	Remove
228	<i>Harpephyllum caffrum</i>	6	4	200	Fair	Fair	Low	2.4	1.7	No Impact: 0%		Retain
229	<i>Eucalyptus paniculata</i>	7	6	250	Fair	Fair	Low	3.0	1.8	No Impact: 0%	Other tags 164	Retain
230	<i>Eucalyptus paniculata</i>	16	8	350	Fair	Fair	Medium	4.2	2.1	No Impact: 0%	Other tags 165	Retain
231	<i>Callistemon salignus</i>	10	5	350	Poor	Fair	Medium	4.2	2.1	No Impact: 0%	Other tags 196	Retain
232	<i>Elaeocarpus reticulatus</i>	4	4	159	Fair	Fair	Low	2.0	1.5	High Impact: >20%		Remove as per section 3/4
233	<i>Elaeocarpus reticulatus</i>	5	5	160	Fair	Fair	Low	2.0	1.5	High Impact: >20%		Remove due to staircase widening
234	<i>Prunus sp.</i>	5	8	200	Fair	Fair	Low	2.4	1.7	High Impact: >20%		Remove
235	<i>Angophora costata</i>	18	15	600	Fair	Fair	Medium	7.2	2.7	No Impact: 0%	In dense Lantana	Retain
236	<i>Eucalyptus paniculata</i>	18	10	300	Fair	Fair	Medium	3.6	2.0	No Impact: 0%	In dense Lantana	Retain

