



John Palmer Primary School  
Arboricultural Impact Assessment

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**School Infrastructure NSW**

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## DOCUMENT TRACKING

<b>Project Name</b>	John Palmer Primary School Arboricultural Impact Assessment
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<b>Status</b>	Final
<b>Version Number</b>	4
<b>Last saved on</b>	12 October 2021

This report should be cited as 'Eco Logical Australia 2021. *John Palmer Primary School Arboricultural Impact Assessment*. Prepared for School Infrastructure NSW.'

## ACKNOWLEDGEMENTS

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## Abbreviations

Abbreviation	Description
AQF	Australian Qualifications Framework
AS	Australian Standards
DBH	Diameter at Breast Height
ELA	Eco Logical Australia
GIS	Geographic Information Systems
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 Introduction

This Arboricultural Impact Assessment (AIA) accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of a State Significant Development Application (SSD - 23330227).

The SSD relates to upgrades comprising alterations and additions to John Palmer Public School, located at 85 The Ponds Boulevard, The Ponds. The site is legally described as Lot 1 DP 1131340.

The site (Figure 1) covers a total area of 29,830m<sup>2</sup> and has three street frontages: Pebble Crescent to the west, Jetty Street to the south and The Ponds Boulevard to the east. The Ponds Shopping Centre adjoins the northern property boundary of the school.

This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs), specifically:

**Table 1: SEARs**

SEARs requirements	Response
3. Trees and Landscaping 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 prepared this AIA for trees within the subject site. Existing canopy coverage of the site is currently 9% (2582sqm/29,828sqm).

## 1.2 The proposal

The proposed development seeks to upgrade John Palmer Public School via the following alterations and additions:

- Construction of a new three storey building facing The Ponds Boulevard which will accommodate 29 Permanent Learning Spaces and 1 new staff room;
- Construction of a one storey new library building;
- Relocation of service access to staff car park off The Ponds Boulevard, including alterations to the existing car park to accommodate service vehicle;
- One-storey extension to and refurbishment of existing School Hall building. The School Hall extension will accommodate ancillary spaces for Out of Hours School Care;
- Building Block D will be re-purposed from an existing library to special program spaces and administration;
- Refurbishment of Building F to provide 1 new support unit;
- Minor additions and internal refurbishments to Building A;
- Removal of all 20 existing demountable classroom buildings once alterations and additions have been completed; and

- Ancillary works to support the alterations and additions including landscaping and service provision.

### 1.3 Purpose of the report

In addition to addressing the SEARs the purpose of this report is to:

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

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

**Table 2: Proposed activity**

Activities that can impact trees	Description of proposed activities
Clearing vegetation	Yes, a total of <b>36 trees</b> are proposed to be cleared
Mitigation measures required to ensure retention	A total of 18 trees are proposed to be retained with mitigation measures. To ensure the viable retention of 11 of these trees (16, 23, 30, 119, 121, 122, 124, 128 and 129 to 131) specific pavement materials for the proposed pathway are required to be in consultation with the Project Arborist prior to construction. An additional seven trees (39A, 39B, 42, 61, 62, 63 and 70) have the potential to be retained as ELA understands that the fire services plan will be positioned to be outside of the TPZ and SRZ. This AIA may require to be updated to ensure retention is viable pending the final location.
Pruning vegetation	No
Earthworks including regrading, excavation and trenching	Yes, proposed buildings, new waste truck pavement, pathways, fire hydrant booster pipes (Appendix I) and water tank.
Compaction	No, storage of materials, installation of structures (i.e., scaffolding), stockpiling fill or materials, parking and vehicle/machinery access are all to be placed outside the TPZ of trees to be retained.
Refuelling and chemical use (e.g. herbicides)	No
Erection of scaffolding	Yes, scaffolding is to be positioned within the impact footprint shown in Appendix C.
Vehicle movements	No, all vehicle access is to be positioned outside of the TPZ of trees to be retained.
Changes to stormwater management	Yes, proposed stormwater trench (assumed width of 1 m) outlined in Appendix H..
Landscaping	Yes, landscaping works will include pavement areas as outlined in Figures 8 and 9 of this report. In addition to this, ELA understands that there is also proposed landscaping works in the north-western corner of the site that is not shown in Figure 8 and 9 of this report. These works are as follows: <ul style="list-style-type: none"> <li>• Inground hardwood pathway or concrete planks (approximately 100mm deep)</li> </ul>

Activities that can impact trees	Description of proposed activities
	<ul style="list-style-type: none"> <li>• Mass planting zones will be hand planted with pot sizes of tube stock – 5L for ground cover planting and 25L – 200L tree planting.</li> <li>• Playing field - existing turf areas to be retained (no new turf), however some “make good” works may be required after the construction of the School, and new turf may be required in some areas.</li> </ul> <p>It is understood that all trees in this area are proposed to be retained, with construction methods for these work to occur in consultation with the Project Arborist during the detailed design phase of this project. Any changes to impacts identified during detailed design will require additional assessment.</p>



Figure 1: 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.

Blacktown City Council defines a tree as:

*'having a height of more than 3 m; or a trunk diameter of more than 200 mm; or more measured 1 m above ground level' (Blacktown City Council 2015).*

### 2.2 Visual tree assessment

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

A total of **148** trees were tagged and inspected on Thursday 20 and Friday 21 August 2020 by AQF Level 5 Consulting Arborist, David Bidwell.

The following limitations apply to this methodology:

- Tree height was measured using a laser clinometer.
- Diameter at breast height (DBH) was measured using DBH tape.
- Trees were inspected from ground level, without the use of any invasive or diagnostic tools and testing.
- Trees were inspected within limits of site access.
- No aerial inspections or root mapping was undertaken.
- Tree canopy was measured by stepping out the distance between the driplines.
- Tree identification was based on broad taxonomical features present and visible from ground level at the time of inspection.
- Tree locations were recorded using hand-held GPS units and moved to the C.M.S. Surveyors survey plan (2021).

### 2.3 Retention value

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

- High - priority for retention: These trees are considered important and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by Australian Standard *AS 4970–2009 Protection of trees on development sites*.

- Medium - consider for retention: These trees are moderately important for retention. Their removal should only be considered if adversely affected by the proposed works and all other alternatives have been considered and exhausted.
- Low - consider for removal: These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- Priority for removal: These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

## 2.4 Protection zones

### 2.4.1 Tree protection zone (TPZ)

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

### 2.4.2 Structural root zone (SRZ)

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

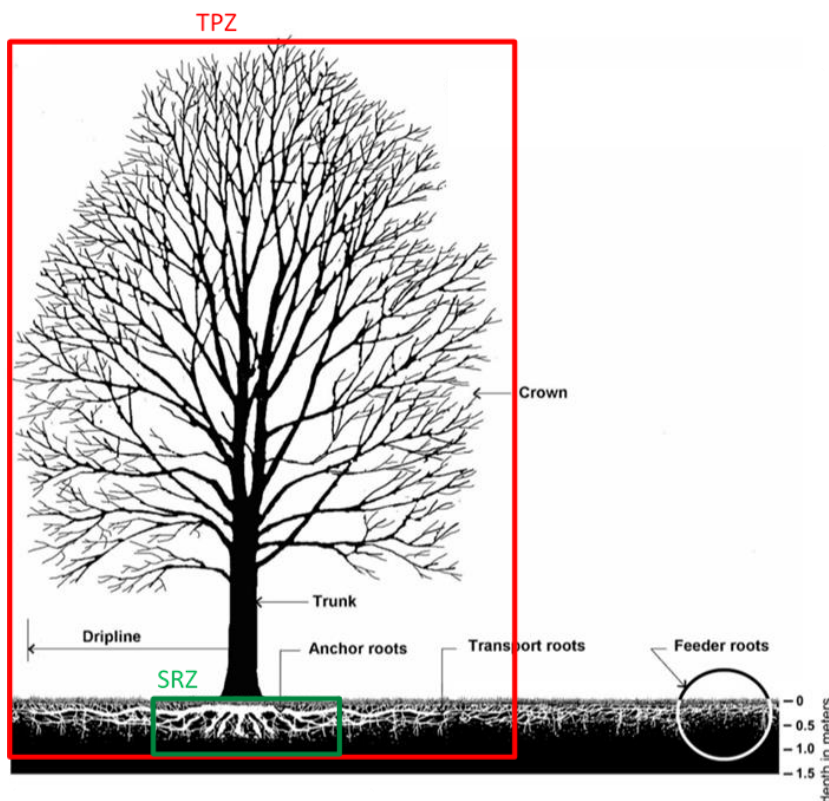


Figure 2: Representative tree structure and indicative TPZ and SRZ

## 2.5 Potential impacts

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

- **Major encroachment** - If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable. The location and distribution of roots may be determined through non-destructive excavation (NDE) methods such as hydro-vacuum excavation (sucker truck), Air Spade or manual extraction. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.
- **Minor encroachment** – If the proposed encroachment is less than 10% of the TPZ, and outside of the SRZ, detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

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

- **High impact:** The SRZ is directly affected or the proposed encroachment is greater than 20% of the TPZ. Trees may not remain viable if they are subject to high impact. 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.

## 2.6 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 E.

- **Retain with mitigation measures:** Trees that require further investigation  
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 4. Detailed results are included in Appendices C and D. No high retention value trees were identified on the site. Site photos are provided in Appendix F, design/tree removal plan is illustrated in Appendix G, stormwater plan is provided in Appendix H and the fire services plan is outlined in Appendix I. Any changes to the proposed plans during the detailed design phase may require additional assessment.

**Table 3: Summary of tree retention values and impacts**

Retention value	Remove	Retain	Retain with mitigation measures	Total
Consider for retention (Medium)	14	39	10	63
Consider for removal (Low)	22	55	8	85
<b>Total</b>	<b>36</b>	<b>94</b>	<b>18</b>	<b>148</b>

#### 3.1 Trees proposed to be removed

A total of **36 trees** are proposed to be removed. Of these, 34 trees will be subject to high impact (>20% TPZ or SRZ encroachment) from the proposed works and two trees (Trees 18 and 19) are proposed to be removed due to the clearance zone required around the existing substation as previously discussed with Council on 08.09.2021. Tree IDs and retention values are outlined below.

- **Medium retention value:** 14 trees
  - Trees 1, 2, 5, 6, 9, 10, 15, 18, 19, 33, 34, 35, 132 and 133.
- **Low retention value:** 22 trees
  - Trees 3, 4, 7, 8, 11, 36, 37, 49, 50, 64A-64G and 113-118

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

#### 3.2 Trees to be retained with mitigation measures

A total of **18 trees** are proposed to be retained subject to the following outcomes.

##### PROPOSED PATH

Eleven (**11**) of the 18 trees to be retained with mitigation measures will be subject to high impact (>20% TPZ or SRZ encroachment) from the proposed path (outlined in purple in Figures 8 and 9), however ELA understands that the pathway will be constructed using permeable paving with no machinery, excavation or revelling required within the TPZ of these trees. Specific pavement materials and construction methods for the pathway are to be determined in consultation with the Project Arborist prior to the commencement of works. This is outlined in section 5 'hold points, inspection and certifications' of this report. Tree IDs for the 11 trees are as follows:

- **Medium retention value:** six Trees 23, 121, 122, 128, 130 and 131.
- **Low retention value:** five Trees 16, 30, 119, 124 and 129

## FIRE SERVICES

**Seven** of the 18 trees to be retained with mitigation measures will be subject to high impact (>20% TPZ or SRZ encroachment) from the proposed fire services plan (outlined in maroon in Figures 8 and 9), however ELA understand that the that the fire services plan will be positioned outside of the SRZ and TPZ of these trees and therefore have the potential to be retained subject to consultation with the Project Arborist regarding the construction methodology i.e. all works within the TPZ of these trees should be completed using hand tools, no machinery or excavation works should be undertaken in this area, and all works should occur under the supervision of an AQF Level 5 Consulting Arborist.

Tree IDs for the seven trees are as follows:

- **Medium retention value: four** Trees 42, 61, 62 and 63
- **Low retention value: three** Trees 39A, 39B, and 70.

### 3.3 Trees proposed to be retained

A total of **94 trees** are proposed to be retained. Of these, ten trees will be subject to low impact (<10% TPZ encroachment) and 84 will be subject to no impact (0% TPZ encroachment) from the proposed works. Tree retention values and IDs are outlined below.

- Low impact (<10% TPZ encroachment)
  - **Medium retention value: six** trees 28, 31, 51, 55, 59 and 125
  - **Low retention value: four** trees 17, 25, 123 and 126
- No Impact (0% TPZ encroachment)
  - **Medium retention value: 33 trees**
  - **Low retention value: 51 trees**

Tree IDs are outlined in Appendices C and D

Tree protection measures are outlined in section 4 and further information is in Appendix E.

## 4. Tree protection plan

- All tree pruning and removal is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- All tree work must be in accordance with Australian Standard *AS 4373-2007, Pruning of Amenity Trees* and the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).
- 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 measures are summarised in Table 5 and further information is in Appendix E

**Table 4: 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.
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 certifications

An AQF Level 5 Consulting Arborist needs to be engaged to supervise works within the TPZ, provide advice regarding tree protection measures 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 should only proceed following consultation and agreeance with the project arborist.

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**

To ensure the viable retention of the 11 trees (16, 23, 30, 119, 121, 122, 124 and 128 to 131) specific pavement materials and construction methods for the proposed pathway are required to be determined in consultation with the Project Arborist prior to construction. ELA also understands that the fire services plan will be positioned outside of the TPZ and SRZ of seven trees (39A, 39B, 42, 61, 62, 63 and 70) and the Project Arborist should confirm the approach for these works is suitable for the retention of these seven Trees and this AIA may need to be updated to ensure retention is viable.

Prior to any construction, an onsite meeting should be conducted between the Project Arborist (AQF Level 5 Consulting Arborist), site manager and construction personnel team, along with any other relevant personnel, so that a walkthrough the tree protection measures requirements can be undertaken. All trees approved for removal are to be indicated clearly with spray paint on trunks.

### **During construction**

Notification should be given prior to the commencement of works within the TPZ of any trees to be retained (including the permeable pavers for the proposed pathway). Supervision of any works in this zone is required to be undertaken by the Project Arborist. Monthly inspection (or other timing as agreed with the Project Arborist) of trees is required to be undertaken by the Project Arborist .

### **Post-construction**

Final inspection of trees should be carried out by the Project Arborist after all major construction has ceased and following the removal of tree protection measures.

## 6. References

### 6.1 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
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### 6.2 Project specific references

- Aecom 2021. *Fire Services Plan, John Palmer Public School*. Proj no. 60654726, revision 2, dated 22 September 2021.
- Blacktown City Council 2015. *4.3 Tree preservation, Part A introduction and General Guidelines, Blacktown Development Control Plan*, page 21 of 59
- C.M.S. Surveyors Pty Ltd 2020. *Survey Plan Showing Detail, levels & underground services over lot 1 in DP1131340 John Palmer Public School 85 The Ponds Boulevard the Ponds, NSW, 2769*. Issue 1, dwg name 19524detail, reviewed 2 July 2021.
- McIntosh & Phelps 2021. *Design Development – External Works, John Palmer Public School*. Dwg 1-5 dated 27 September 2021
- PTW Architects 2021. *Inground Civil Overlay, John Palmer Public School, 85 The Ponds Blvd, The Ponds NSW 2769*. Dwg no. SK-00-040, revision A dated 16 September 2021.

## 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.

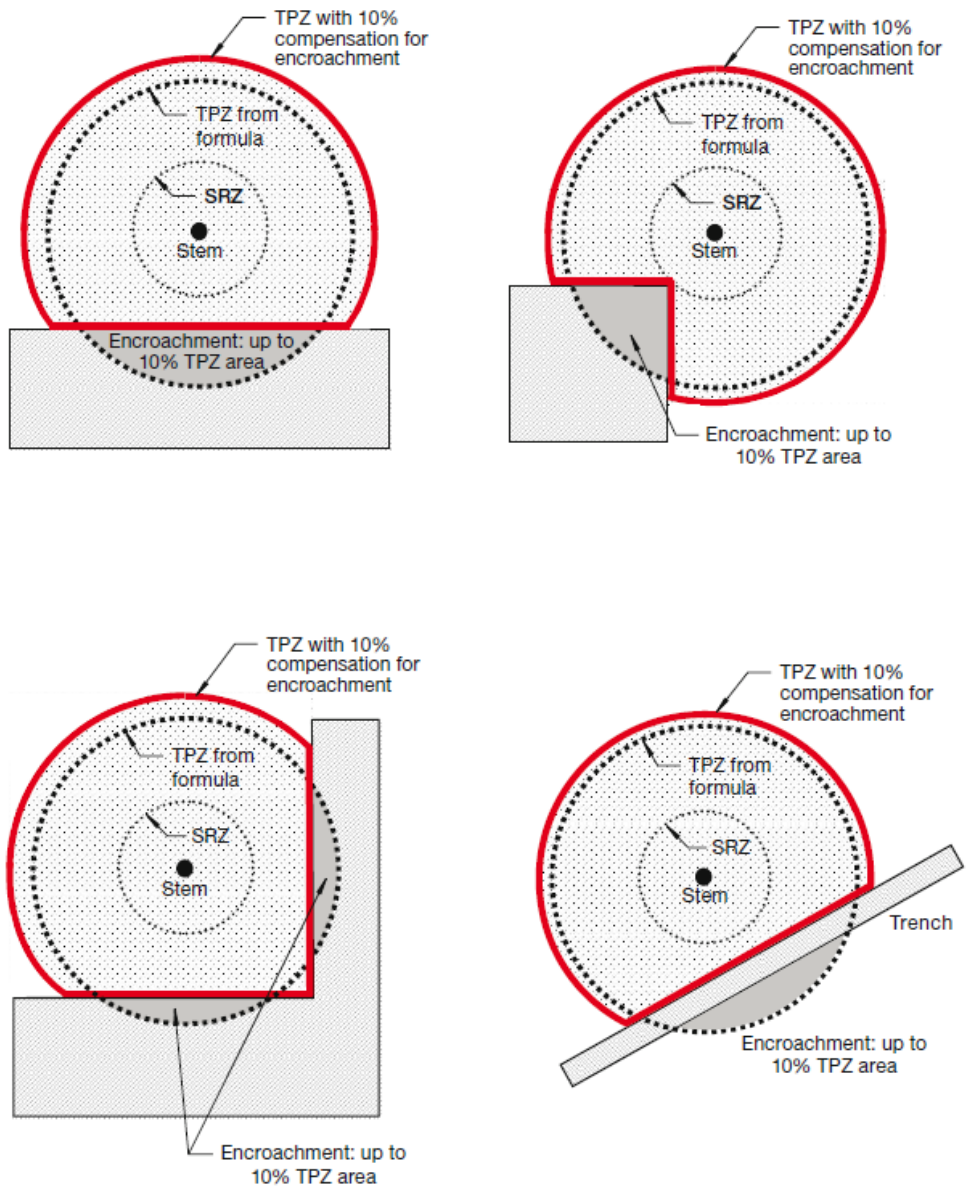
Low	Medium	High
<p>The tree is in fair-poor condition and good or low vigour.</p> <p>The tree has form atypical of the species</p> <p>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings</p> <p>The tree provides a minor contribution 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><b>Environmental Pest / Noxious Weed</b></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><b>Hazardous /Irreversible Decline</b></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					

	<p><b>Priority for retention (High):</b> 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.</p>
	<p><b>Consider for retention (Medium):</b> 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.</p>
	<p><b>Consider for removal (Low):</b> Tree not considered important for retention, nor requiring special works or design modification to be implemented for their retention.</p>
	<p><b>Priority for removal:</b> These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.</p>

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

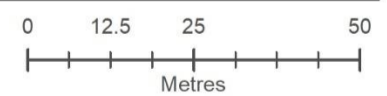


Appendix C Maps



Overview

- Subject Land
- Pages
- Tree locations



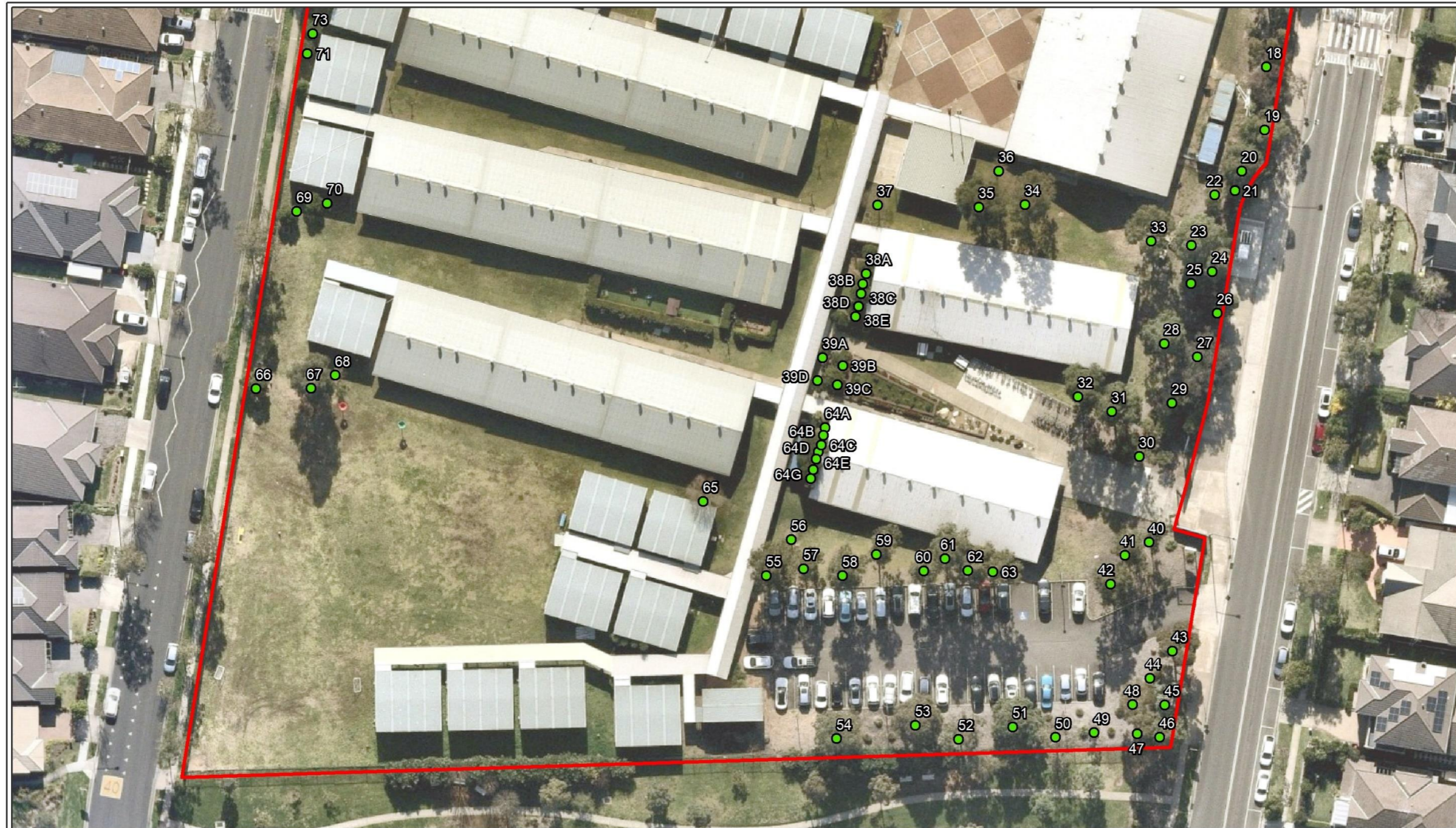
Datum/Projection:  
GDA 1994 MGA Zone 56  
Project: 19365-SC Date: 22/09/2021





Figure 3: Overview map

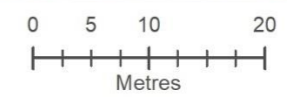


Figure 4: Tree locations, page 1



**Tree Locations - Page 2**

-  Subject Land
-  Tree Locations



Datum/Projection:  
GDA 1994 MGA Zone 56  
Project: 19365-SC Date: 21/09/2021



Figure 5: Tree locations, page 2

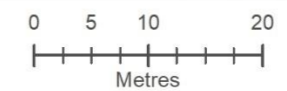


Figure 6: Retention values, page 1



Retention Values - Page 2

- Subject Land
- Retention Values**
- Medium
- Low



Datum/Projection:  
GDA 1994 MGA Zone 56  
Project: 19365-SC Date: 21/09/2021



Figure 7: Retention values, page 2

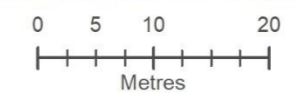


Figure 8: Proposed action, page 1



**Proposed Action - Page 2**

- |                     |            |                      |                                 |
|---------------------|------------|----------------------|---------------------------------|
| Subject Land        | Building   | Tree Protection Zone | <b>Proposed Action</b>          |
| Carpark             | Fire Pipe  | Structural Root Zone |                                 |
| Path                | Stormwater | Remove               |                                 |
| Existing Substation |            |                      | Retain with mitigation measures |
|                     |            |                      | Retain                          |



Datum/Projection:  
GDA 1994 MGA Zone 56  
Project: 19365-SC Date: 12/10/2021



Figure 9: Proposed action, page 2

## Appendix D Tabulated results of arboricultural assessment

Tree	Botanical name	Height (m)	Spread (m)	Health	Structure	DBH (mm)	TPZ (m)	SRZ (m)	SULE	Retention value	Landscape significance	TPZ% encroachment	SRZ encroachment	Impact	Proposed action	Notes
1	<i>Corymbia maculata</i>	15	6	Good	Good	300	3.6	2.0	Long (>40 years)	Medium	Medium	60	Yes	High Impact: >20%	Remove	Previously tagged 4
2	<i>Eucalyptus fibrosa</i>	10	7	Good	Fair	360	4.3	2.2	Medium (15-40 years)	Medium	Medium	44	Yes	High Impact: >20%	Remove	Bifurcation
3	<i>Eucalyptus crebra</i>	9	4	Good	Good	240	2.9	1.8	Long (>40 years)	Low	Low	53	Yes	High Impact: >20%	Remove	Previously tagged 7
4	<i>Angophora costata</i>	6	3	Fair	Fair	180	2.2	1.6	Medium (15-40 years)	Low	Low	56	Yes	High Impact: >20%	Remove	Twin stems
5	<i>Corymbia maculata</i>	14	7	Good	Good	340	4.1	2.1	Long (>40 years)	Medium	Medium	45	Yes	High Impact: >20%	Remove	Previously tagged 9
6	<i>Corymbia maculata</i>	12	5	Good	Good	310	3.7	2.0	Long (>40 years)	Medium	Medium	100	Yes	High Impact: >20%	Remove	Previously tagged
7	<i>Eucalyptus crebra</i>	8	4	Fair	Good	220	2.6	1.8	Long (>40 years)	Low	Low	38	Yes	High Impact: >20%	Remove	Previously tagged 11
8	<i>Corymbia maculata</i>	10	3	Fair	Fair	160	2.0	1.5	Medium (15-40 years)	Low	Low	45	Yes	High Impact: >20%	Remove	Previously tagged 12
9	<i>Corymbia maculata</i>	12	5	Good	Good	319	3.8	2.1	Long (>40 years)	Medium	Medium	24	Yes	High Impact: >20%	Remove	Previously tagged 13
10	<i>Corymbia maculata</i>	9	5	Good	Good	290	3.5	2.0	Long (>40 years)	Medium	Medium	100	Yes	High Impact: >20%	Remove	Previously tagged 1
11	<i>Corymbia maculata</i>	7	3	Fair	Good	190	2.3	1.7	Long (>40 years)	Low	Low	100	Yes	High Impact: >20%	Remove	Previously tagged
12	<i>Jacaranda mimosifolia</i>	5	4	Fair	Fair	100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
13	<i>Jacaranda mimosifolia</i>	4	4	Fair	Fair	100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
14	<i>Jacaranda mimosifolia</i>	5	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
15	<i>Eucalyptus crebra</i>	14	5	Fair	Fair	280	3.4	1.9	Medium (15-40 years)	Medium	Medium	72	Yes	High Impact: >20%	Remove	Previously tagged 14
16	<i>Eucalyptus sp.</i>	7	3	Good	Fair	100	2.0	1.5	Medium (15-40 years)	Low	Low	15	Yes	High Impact: >20%	Retain with mitigation measures	Multi trunked
17	<i>Eucalyptus crebra</i>	8	4	Fair	Fair	200	2.4	1.7	Medium (15-40 years)	Low	Low	2	No	Low Impact: <10%	Retain	Previously tagged 16
18	<i>Eucalyptus fibrosa</i>	14	9	Fair	Fair	380	4.6	2.2	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Remove	Tear out on trunk
19	<i>Corymbia maculata</i>	16	8	Good	Good	350	4.2	2.1	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Remove	Previously tagged 18, bifurcation
20	<i>Corymbia maculata</i>	18	8	Good	Good	380	4.6	2.2	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 18
21	<i>Eucalyptus fibrosa</i>	4	2	Good	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
22	<i>Eucalyptus sp.</i>	5	2	Poor	Poor	<100	2.0	1.5	Short (5-15 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 20
23	<i>Corymbia maculata</i>	17	8	Good	Good	310	3.7	2.0	Long (>40 years)	Medium	Medium	32	Yes	High Impact: >20%	Retain with mitigation measures	Previously tagged 22
24	<i>Corymbia maculata</i>	17	5	Fair	Fair	320	3.8	2.1	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged,
25	<i>Angophora costata</i>	7	4	Fair	Fair	150	2.0	1.5	Long (>40 years)	Low	Low	1	No	Low Impact: <10%	Retain	Previously tagged 27
26	<i>Angophora costata</i>	8	4	Good	Good	200	2.4	1.7	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 28
27	<i>Eucalyptus sideroxylon</i>	10	10	Good	Good	400	4.8	2.3	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 30
28	<i>Corymbia maculata</i>	16	8	Good	Good	300	3.6	2.0	Long (>40 years)	Medium	Medium	1	No	Low Impact: <10%	Retain	Previously tagged 31
29	<i>Eucalyptus sp.</i>	5	2	Fair	Fair	100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 32
30	<i>Eucalyptus sp.</i>	8	4	Fair	Fair	100	2.0	1.5	Medium (15-40 years)	Low	Low	45	Yes	High Impact: >20%	Retain with mitigation measures	Previously tagged 35
31	<i>Corymbia maculata</i>	14	8	Good	Good	310	3.7	2.0	Long (>40 years)	Medium	Medium	0	No	Low Impact: <10%	Retain	Previously tagged 34
32	<i>Corymbia maculata</i>	15	8	Good	Good	290	3.5	2.0	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	

Tree	Botanical name	Height (m)	Spread (m)	Health	Structure	DBH (mm)	TPZ (m)	SRZ (m)	SULE	Retention value	Landscape significance	TPZ% encroachment	SRZ encroachment	Impact	Proposed action	Notes
33	<i>Corymbia maculata</i>	14	10	Good	Good	300	3.6	2.0	Long (>40 years)	Medium	Medium	80	Yes	High Impact: >20%	Remove	Previously tagged
34	<i>Corymbia maculata</i>	15	8	Good	Good	340	4.1	2.1	Long (>40 years)	Medium	Medium	100	Yes	High Impact: >20%	Remove	
35	<i>Corymbia maculata</i>	12	6	Good	Good	370	4.4	2.2	Long (>40 years)	Medium	Medium	87	Yes	High Impact: >20%	Remove	Previously tagged 25
36	<i>Triadica sebifera</i>	5	4	Fair	Fair	110	2.0	1.5	Medium (15-40 years)	Low	Low	100	Yes	High Impact: >20%	Remove	
37	<i>Triadica sebifera</i>	5	4	Good	Good	160	2.0	1.5	Medium (15-40 years)	Low	Low	21	Yes	High Impact: >20%	Remove	
38A	<i>Tristaniopsis laurina</i>	4	3	Good	Good	100	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tagged as Tree 38 (Group of 5 small trees)
38B	<i>Tristaniopsis laurina</i>	4	3	Good	Good	100	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
38C	<i>Tristaniopsis laurina</i>	4	3	Good	Good	100	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
38D	<i>Tristaniopsis laurina</i>	4	3	Good	Good	100	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
38E	<i>Tristaniopsis laurina</i>	4	3	Good	Good	100	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
39A	<i>Tristaniopsis laurina</i>	4	2	Good	Good	<100	2.0	1.5	Long (>40 years)	Low	Low	30	Yes	High Impact: >20%	Retain with mitigation measures	Tagged as Tree 39 (Group of 4 small trees)
39B	<i>Tristaniopsis laurina</i>	4	2	Good	Good	<100	2.0	1.5	Long (>40 years)	Low	Low	28	Yes	High Impact: >20%	Retain with mitigation measures	Tree in above group
39C	<i>Tristaniopsis laurina</i>	4	2	Good	Good	<100	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
39D	<i>Tristaniopsis laurina</i>	4	2	Good	Good	<100	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
40	<i>Corymbia maculata</i>	10	5	Fair	Fair	190	2.3	1.7	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 39
41	<i>Corymbia maculata</i>	10	7	Fair	Fair	210	2.5	1.7	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 38
42	<i>Corymbia maculata</i>	11	6	Fair	Fair	250	3.0	1.9	Medium (15-40 years)	Medium	Medium	32	Yes	High Impact: >20%	Retain with mitigation measures	Previously tagged 37
43	<i>Eucalyptus sideroxylon</i>	14	9	Good	Good	320	3.8	2.1	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 42
44	<i>Eucalyptus sp.</i>	4	3	Good	Fair	<100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Multi trunked
45	<i>Eucalyptus sideroxylon</i>	10	8	Fair	Fair	280	3.4	1.9	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 44
46	<i>Corymbia maculata</i>	15	7	Good	Good	330	4.0	2.1	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 45
47	<i>Eucalyptus sideroxylon</i>	12	8	Fair	Fair	310	2.0	1.5	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Large limb recently removed
48	<i>Eucalyptus fibrosa</i>	10	7	Good	Good	220	2.6	1.8	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 47
49	<i>Eucalyptus sp.</i>	4	1	Fair	Poor	<100	2.0	1.5	Short (5-15 years)	Low	Low	83	Yes	High Impact: >20%	Remove	Stump re-sprout
50	<i>Eucalyptus tereticornis</i>	10	5	Fair	Fair	170	2.0	1.6	Medium (15-40 years)	Low	Low	67	Yes	High Impact: >20%	Remove	Previously tagged 49
51	<i>Angophora costata</i>	10	10	Good	Good	340	4.1	2.1	Long (>40 years)	Medium	Medium	1	No	Low Impact: <10%	Retain	Previously tagged 50
52	<i>Eucalyptus tereticornis</i>	10	6	Fair	Good	210	2.5	1.7	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 51
53	<i>Angophora costata</i>	12	9	Good	Good	360	4.3	2.2	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 52
54	<i>Corymbia maculata</i>	11	10	Good	Good	340	4.1	2.1	Long (>40 years)	Medium	Medium	2	No	Low Impact: <10%	Retain	Previously tagged 53, twin stems
55	<i>Corymbia maculata</i>	15	8	Good	Good	350	4.2	2.1	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
56	<i>Triadica sebifera</i>	5	4	Fair	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
57	<i>Corymbia maculata</i>	12	5	Good	Good	220	2.6	1.8	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged
58	<i>Corymbia maculata</i>	14	6	Good	Good	320	3.8	2.1	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged
59	<i>Corymbia maculata</i>	10	5	Good	Good	260	3.1	1.9	Long (>40 years)	Medium	Medium	3	No	Low Impact: <10%	Retain	Previously tagged 61

Tree	Botanical name	Height (m)	Spread (m)	Health	Structure	DBH (mm)	TPZ (m)	SRZ (m)	SULE	Retention value	Landscape significance	TPZ% encroachment	SRZ encroachment	Impact	Proposed action	Notes
60	<i>Corymbia maculata</i>	10	5	Good	Good	240	2.9	1.8	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
61	<i>Corymbia maculata</i>	14	7	Good	Good	320	3.8	2.1	Long (>40 years)	Medium	Medium	24	Yes	High Impact: >20%	Retain with mitigation measures	Previously tagged 63
62	<i>Corymbia maculata</i>	10	5	Good	Good	250	3.0	1.9	Long (>40 years)	Medium	Medium	23	Yes	High Impact: >20%	Retain with mitigation measures	Previously tagged 64
63	<i>Corymbia maculata</i>	12	5	Good	Good	270	3.2	1.9	Long (>40 years)	Medium	Medium	28	Yes	High Impact: >20%	Retain with mitigation measures	Previously tagged 65
64A	<i>Melaleuca sp.</i>	8	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	7	Yes	High Impact: >20%	Remove	Tagged as Tree 64 (group of 7 large shrubs <i>Melaleuca armillaris</i> , <i>Melaleuca styphelioides</i> )
64B	<i>Melaleuca sp.</i>	8	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	65	Yes	High Impact: >20%	Remove	Tree in above group
64C	<i>Melaleuca sp.</i>	8	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	63	Yes	High Impact: >20%	Remove	Tree in above group
64D	<i>Melaleuca sp.</i>	8	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	65	Yes	High Impact: >20%	Remove	Tree in above group
64E	<i>Melaleuca sp.</i>	8	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	66	Yes	High Impact: >20%	Remove	Tree in above group
64F	<i>Melaleuca sp.</i>	8	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	51	Yes	High Impact: >20%	Remove	Tree in above group
64G	<i>Melaleuca sp.</i>	8	4	Fair	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	27	Yes	High Impact: >20%	Remove	Tree in above group
65	<i>Triadica sebifera</i>	8	8	Fair	Fair	280	3.4	1.9	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
66	<i>Tristaniopsis laurina</i>	5	5	Good	Good	160	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
67	<i>Corymbia maculata</i>	12	6	Good	Good	330	4.0	2.1	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
68	<i>Corymbia maculata</i>	4	2	Poor	Poor	<100	2.0	1.5	Short (5-15 years)	Low	Low	0	No	No Impact: 0%	Retain	
69	<i>Tristaniopsis laurina</i>	4	3	Good	Fair	100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
70	<i>Tristaniopsis laurina</i>	4	3	Fair	Good	100	2.0	1.5	Medium (15-40 years)	Low	Low	30	Yes	High Impact: >20%	Retain with mitigation measures	
71	<i>Tristaniopsis laurina</i>	4	3	Good	Fair	<100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
72	<i>Tristaniopsis laurina</i>	4	3	Good	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
73	<i>Tristaniopsis laurina</i>	4	4	Good	Fair	<100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
74	<i>Eucalyptus crebra</i>	11	6	Fair	Fair	240	2.9	1.8	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Large limb removed
75	<i>Eucalyptus sideroxylon</i>	10	5	Good	Fair	240	2.9	1.8	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 58, large limbs removed
76	<i>Eucalyptus tereticornis</i>	8	4	Fair	Fair	110	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 69
77	<i>Eucalyptus sideroxylon</i>	12	10	Fair	Fair	450	5.4	2.4	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 70
78	<i>Eucalyptus crebra</i>	8	4	Good	Good	160	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 71
79	<i>Eucalyptus crebra</i>	9	6	Good	Fair	220	2.6	1.8	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 72, bifurcation
80	<i>Corymbia maculata</i>	14	6	Good	Good	280	3.4	1.9	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
81	<i>Eucalyptus leucoxylon</i>	12	10	Good	Fair	290	3.5	2.0	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged
82	<i>Eucalyptus fibrosa</i>	8	4	Good	Good	120	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 75
83	<i>Eucalyptus sideroxylon</i>	8	7	Good	Good	350	4.2	2.1	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 75
84	<i>Corymbia maculata</i>	8	4	Fair	Fair	140	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
85	<i>Corymbia maculata</i>	6	5	Good	Good	210	2.5	1.7	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 79
86	<i>Eucalyptus crebra</i>	11	4	Good	Fair	200	2.4	1.7	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 80. Bifurcation

Tree	Botanical name	Height (m)	Spread (m)	Health	Structure	DBH (mm)	TPZ (m)	SRZ (m)	SULE	Retention value	Landscape significance	TPZ% encroachment	SRZ encroachment	Impact	Proposed action	Notes
87	<i>Corymbia maculata</i>	8	4	Good	Good	180	2.2	1.6	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 81
88	<i>Eucalyptus sp.</i>	7	2	Fair	Fair	<100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 84
89	<i>Corymbia maculata</i>	12	6	Good	Fair	260	3.1	1.9	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 85
90	<i>Eucalyptus crebra</i>	9	4	Fair	Fair	190	2.3	1.7	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 85
91	<i>Corymbia maculata</i>	10	5	Fair	Good	250	3.0	1.9	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 87
92	<i>Angophora costata</i>	8	7	Fair	Good	180	2.2	1.6	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	Previously tagged 98
93	<i>Angophora costata</i>	7	5	Fair	Good	120	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	
94	<i>Corymbia maculata</i>	6	2	Fair	Fair	<100	2.0	1.5	Short (5-15 years)	Low	Low	0	No	No Impact: 0%	Retain	
95	<i>Corymbia maculata</i>	14	6	Good	Good	320	3.8	2.1	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
96	<i>Corymbia maculata</i>	15	5	Good	Fair	260	3.1	1.9	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Large limb removed
97	<i>Eucalyptus sideroxylon</i>	10	5	Good	Fair	200	2.4	1.7	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Large limb removed
98	<i>Eucalyptus sideroxylon</i>	10	4	Good	Fair	180	2.2	1.6	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Large limb removed
99	<i>Eucalyptus sideroxylon</i>	10	4	Good	Fair	200	2.4	1.7	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Large limb removed
100	<i>Eucalyptus leucoxylon</i>	8	6	Good	Fair	250	3.0	1.9	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
101	<i>Eucalyptus sideroxylon</i>	9	5	Good	Fair	250	3.0	1.9	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Large limb removed, previously tagged 89
102	<i>Eucalyptus sideroxylon</i>	10	6	Good	Good	230	2.8	1.8	Long (>40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	
103	<i>Eucalyptus tereticornis</i>	8	4	Fair	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
104	<i>Eucalyptus tereticornis</i>	5	1	Fair	Fair	<109	2.0	1.5	Short (5-15 years)	Low	Low	0	No	No Impact: 0%	Retain	
105	<i>Acmena smithii</i>	3	3	Good	Fair	<100	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
106	<i>Eucalyptus tereticornis</i>	5	2	Fair	Fair	<100	2.0	1.5	Short (5-15 years)	Low	Low	0	No	No Impact: 0%	Retain	
107	<i>Eucalyptus sideroxylon</i>	12	8	Good	Fair	350	4.2	2.1	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Large limb removed
108	<i>Eucalyptus sideroxylon</i>	10	2	Good	Good	160	2.0	1.5	Long (>40 years)	Low	Low	0	No	No Impact: 0%	Retain	
109	<i>Eucalyptus sp.</i>	4	2	Fair	Fair	<100	2.0	1.5	Short (5-15 years)	Low	Low	0	No	No Impact: 0%	Retain	
110	<i>Angophora costata</i>	6	2	Fair	Fair	110	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
111	<i>Eucalyptus tereticornis</i>	10	3	Good	Good	110	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
112	<i>Eucalyptus tereticornis</i>	11	4	Fair	Good	140	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	
113	<i>Fraxinus griffithii</i>	4	4	Fair	Good	130	2.0	1.5	Medium (15-40 years)	Low	Low	42	Yes	High Impact: >20%	Remove	
114	<i>Fraxinus griffithii</i>	4	3	Fair	Good	100	2.0	1.5	Medium (15-40 years)	Low	Low	100	Yes	High Impact: >20%	Remove	
115	<i>Fraxinus griffithii</i>	3	2	Fair	Fair	<100	2.0	1.5	Medium (15-40 years)	Low	Low	100	Yes	High Impact: >20%	Remove	Bark wounds
116	<i>Fraxinus griffithii</i>	3	3	Fair	Good	100	2.0	1.5	Medium (15-40 years)	Low	Low	100	Yes	High Impact: >20%	Remove	
117	<i>Fraxinus griffithii</i>	6	6	Good	Good	150	2.0	1.5	Medium (15-40 years)	Low	Low	65	Yes	High Impact: >20%	Remove	
118	<i>Triadica sebifera</i>	3	3	Poor	Poor	<100	2.0	1.5	Remove (<5 years)	Low	Low	12	Yes	High Impact: >20%	Remove	Nearly dead
119	<i>Melaleuca styphelioides</i>	6	4	Good	Fair	150	2.0	1.5	Medium (15-40 years)	Low	Low	16	Yes	High Impact: >20%	Retain with mitigation measures	Multi trunked
120	<i>Eucalyptus tereticornis</i>	10	6	Good	Fair	200	2.4	1.7	Medium (15-40 years)	Medium	Medium	0	No	No Impact: 0%	Retain	Previously tagged 91, bifurcation
121	<i>Eucalyptus crebra</i>	10	8	Good	Good	250	3.0	1.9	Long (>40 years)	Medium	Medium	45	Yes	High Impact: >20%	Retain with mitigation measures	

Tree	Botanical name	Height (m)	Spread (m)	Health	Structure	DBH (mm)	TPZ (m)	SRZ (m)	SULE	Retention value	Landscape significance	TPZ% encroachment	SRZ encroachment	Impact	Proposed action	Notes
122	<i>Corymbia maculata</i>	14	6	Good	Good	270	3.2	1.9	Long (>40 years)	Medium	Medium	42	Yes	High Impact: >20%	Retain with mitigation measures	
123	<i>Melaleuca armillaris</i>	7	6	Fair	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	Low Impact: <10%	Retain	Large shrub
124	<i>Melaleuca armillaris</i>	5	2	Fair	Fair	100	2.0	1.5	Short (5-15 years)	Low	Low	24	Yes	High Impact: >20%	Retain with mitigation measures	Large shrub
125	<i>Eucalyptus sideroxylon</i>	10	8	Fair	Fair	300	3.6	2.0	Medium (15-40 years)	Medium	Medium	9	No	Low Impact: <10%	Retain	Bifurcation
126	<i>Eucalyptus crebra</i>	6	3	Good	Fair	140	2.0	1.5	Medium (15-40 years)	Low	Low	4	No	Low Impact: <10%	Retain	
127A	<i>Melaleuca armillaris</i>	7	4	Fair	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tagged as Tree 127 (group of 3 paperbarks)
127B	<i>Melaleuca armillaris</i>	7	4	Fair	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
127C	<i>Melaleuca armillaris</i>	7	4	Fair	Fair	120	2.0	1.5	Medium (15-40 years)	Low	Low	0	No	No Impact: 0%	Retain	Tree in above group
128	<i>Eucalyptus crebra</i>	11	5	Good	Fair	260	3.1	1.9	Medium (15-40 years)	Medium	Medium	17	Yes	High Impact: >20%	Retain with mitigation measures	Bifurcation
129	<i>Eucalyptus crebra</i>	5	2	Good	Fair	100	2.0	1.5	Medium (15-40 years)	Low	Low	16	Yes	High Impact: >20%	Retain with mitigation measures	
130	<i>Eucalyptus crebra</i>	12	7	Good	Good	200	2.4	1.7	Long (>40 years)	Medium	Medium	13	Yes	High Impact: >20%	Retain with mitigation measures	
131	<i>Eucalyptus crebra</i>	12	6	Good	Good	220	2.6	1.8	Long (>40 years)	Medium	Medium	20	Yes	High Impact: >20%	Retain with mitigation measures	
132	<i>Corymbia maculata</i>	12	6	Good	Good	260	3.1	1.9	Long (>40 years)	Medium	Medium	23	Yes	High Impact: >20%	Remove	
133	<i>Eucalyptus crebra</i>	12	5	Good	Fair	240	2.9	1.8	Medium (15-40 years)	Medium	Medium	46	Yes	High Impact: >20%	Remove	Mechanical damage

## 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.

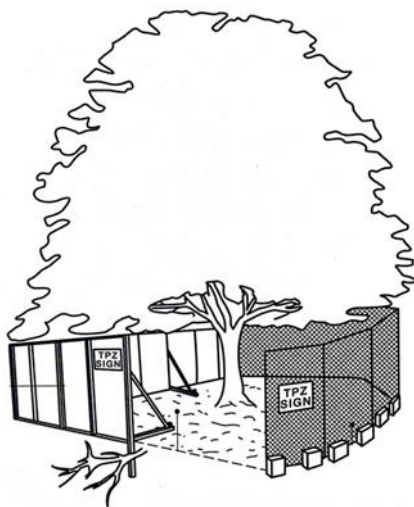
### E3 Trunk protection

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.

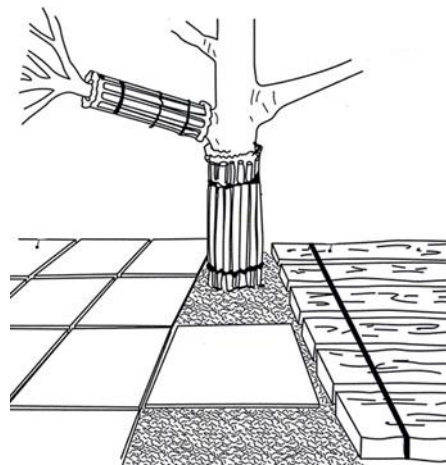
The removal of bark or branches allows the potential ingress of micro-organisms which may cause decay. Furthermore, the removal of bark restricts the trees' ability to distribute water, mineral ions (solutes), and glucose.

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 33



Figure 11: Medium retention value tree, Tree 34



Figure 12: Medium retention value tree, Tree 35



Figure 13: Low retention value tree, Tree 36



Figure 14: Medium retention value tree, Tree 67



Figure 15: Low retention value tree, Tree 68

Appendix G Design Development (Mcintosh & Phelps 2021)

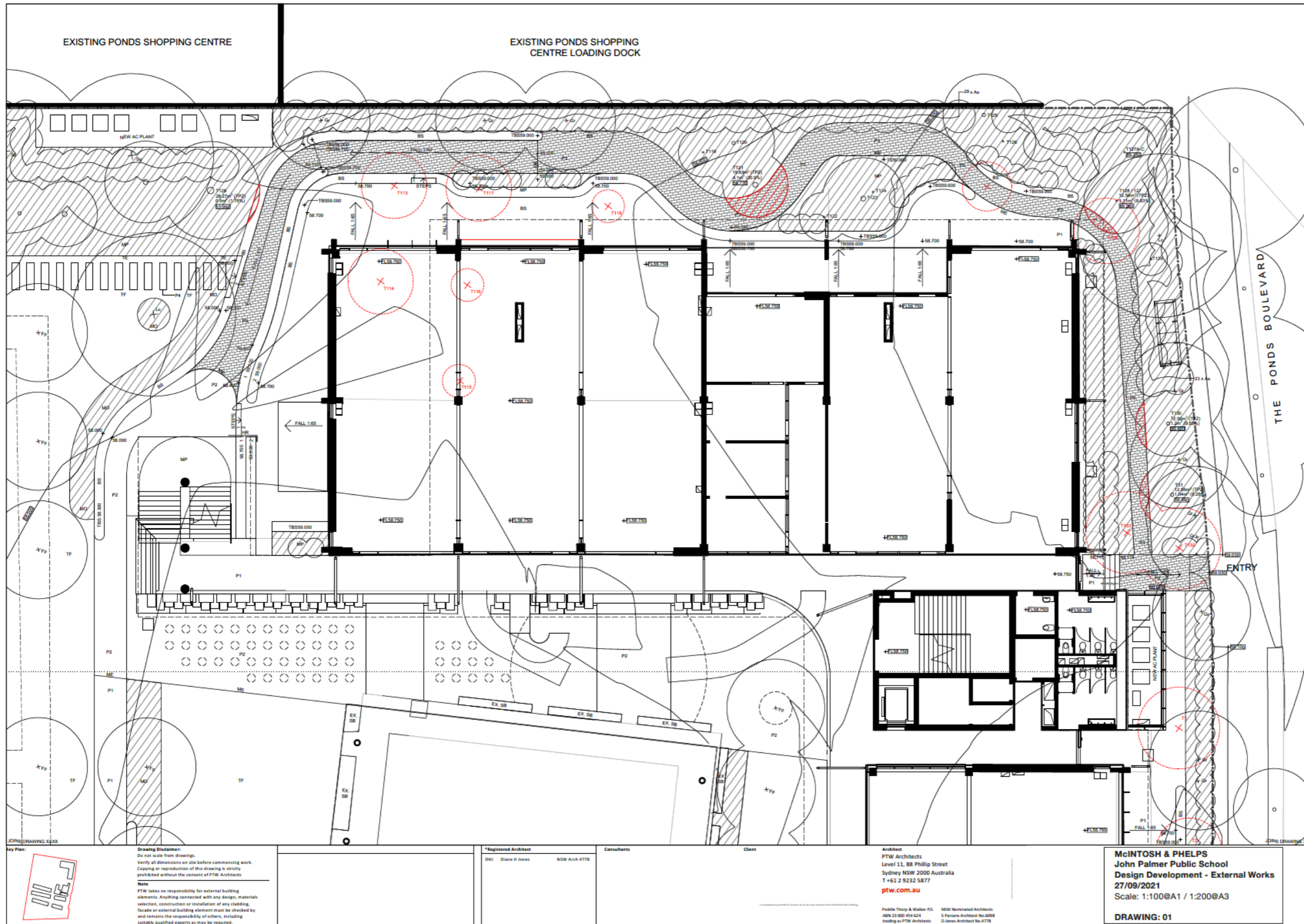
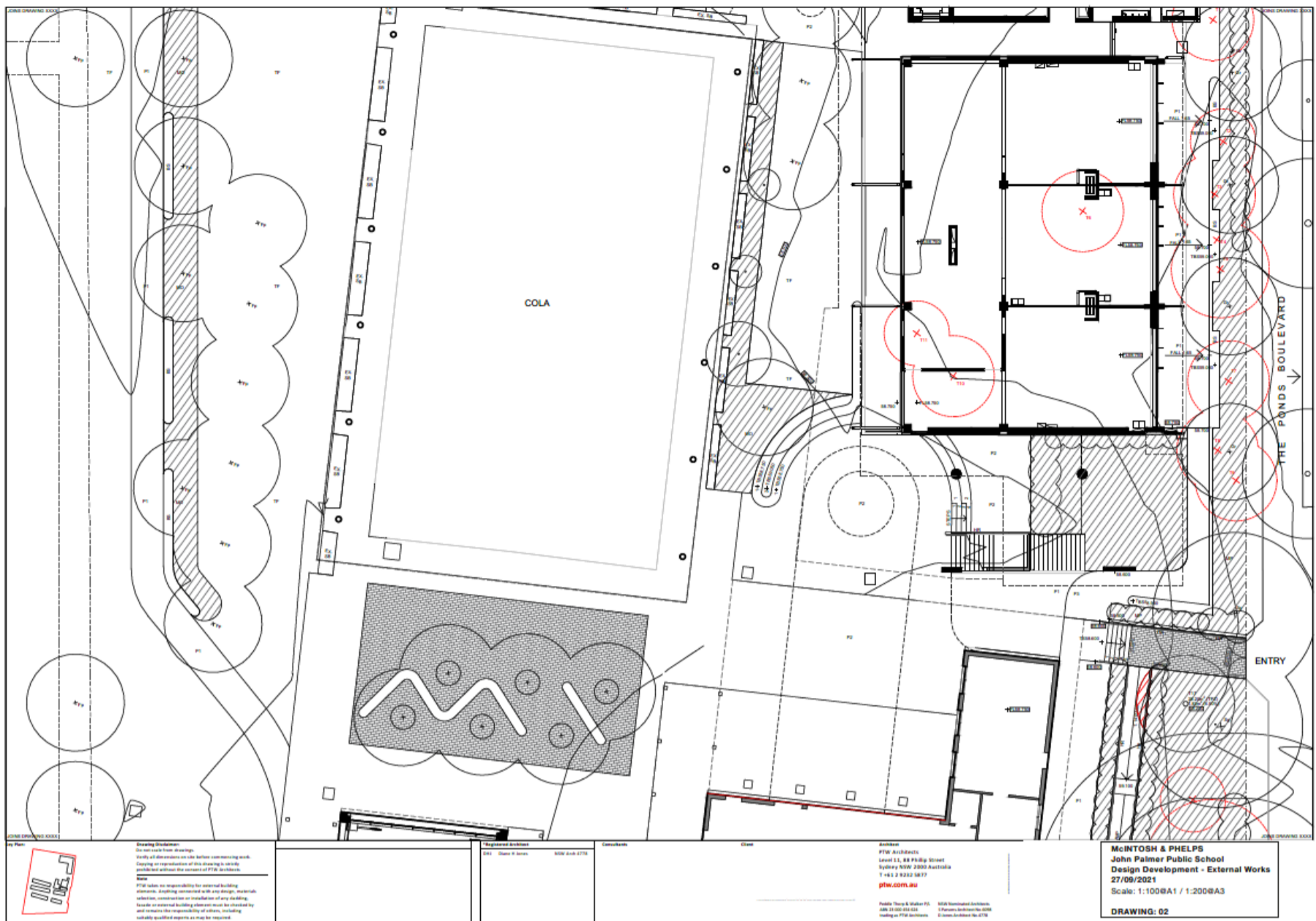


Figure 16: Drawing 01



: Drawing 02

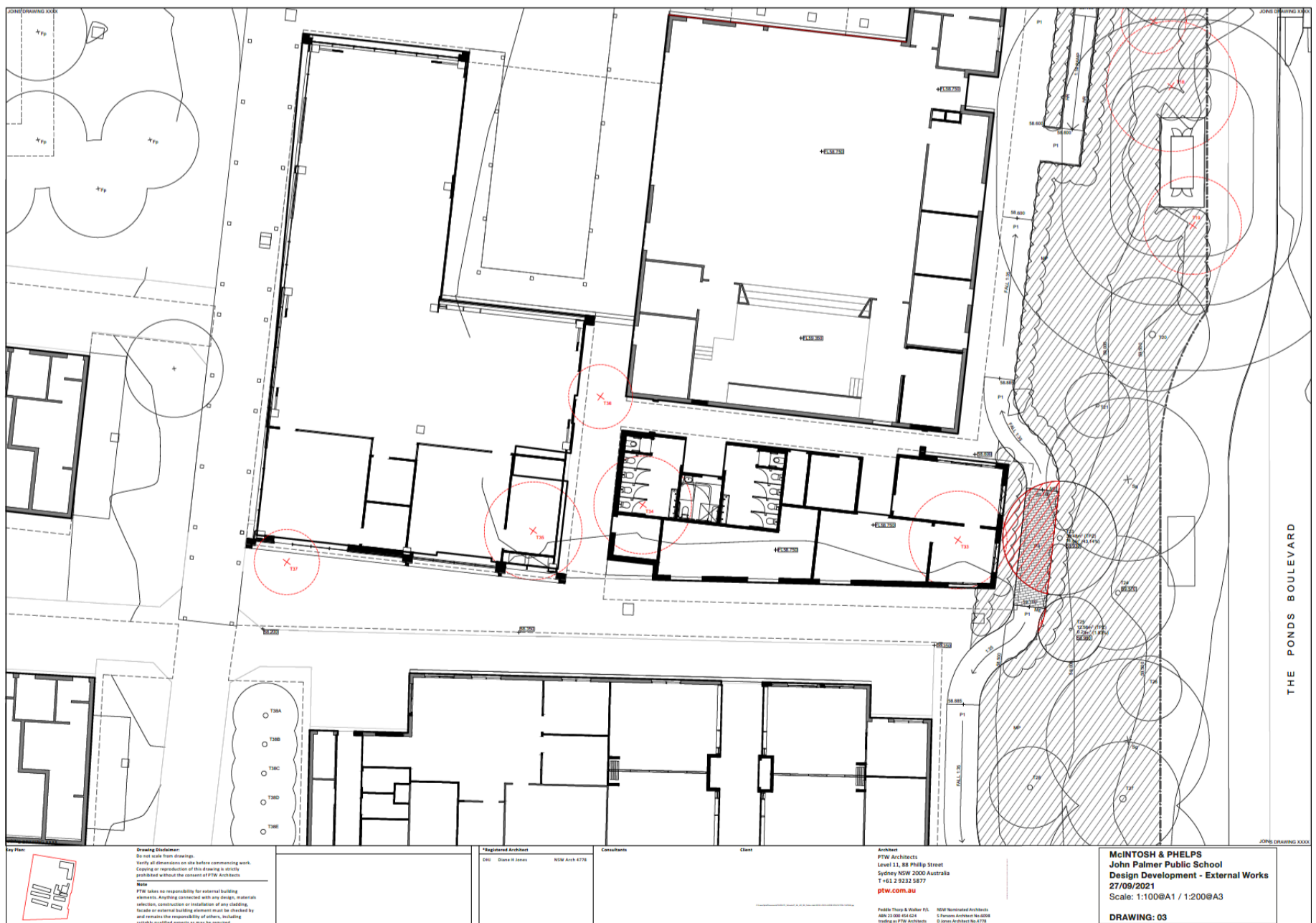


Figure 18: Drawing 03



Appendix H Stormwater plan (PTW Architects 2021)



1 SITE PLAN - L00 - RL 58.750  
1 : 500 @A1

Figure 21: Proposed stormwater outlined in blue



