
Arboricultural Impact Assessment Report

Site: Fairfield Showground
Community and Events
Centre (SSDA)

Prepared for:
Fairfield City Council

Prepared by: Jack Williams
Urban Arbor Pty Ltd
Date Prepared: 20 August 2025
Ref: 250820_FSGSD_AIA

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1. INTRODUCTION

- 1.1 Urban Arbor have been instructed by Fairfield City Council to provide an Arboricultural Impact Assessment Report for trees located within the site and adjoining sites in relation to a proposed development.
- 1.2 This Arboricultural Impact Assessment Report accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), in respect of a State Significant Development Application (SSDA) for the construction and operation of Fairfield Showground Community and Events Centre. This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs) issued for the project, notably:

Table 1 – Summary of Relevant SEARs and Response			
SEAR	Requirement	Response	Report Section
Number	Insert SEAR Dot Point		
8	Assess the number, location, condition and significance of trees to be removed and retained and note any existing canopy coverage to be retained on-site	An Arboricultural Impact Assessment (AIA) report has been prepared that assesses the impact of the proposed development works to prescribed trees at the site in accordance with AS4970 Protection of trees on development sites (2009).	Section 7: Assessment of Construction Impacts Section 8: Conclusions Section 9: Recommendations of existing canopy trees to be retained Appendix 1: Site Plans Appendix 2: Tree Inspection Schedule

1.3 Project Site Description

The project site is located within the Fairfield Local Government Area (LGA), at 430-482 Smithfield Road, Prairiewood, legally identified as Lot 1 DP 1251493 and known as Fairfield Showground.

Lot and DP	Lot Area
Lot 1 DP 1251493	30.1 hectare

Fairfield Showground currently comprises a number of different uses including Fairfield Markets, outdoor sports fields, grandstands incorporating function centres, at-grade parking in multiple locations throughout the site and a range of other community and recreational uses.

The project site is located to the west of the existing market awning as shown in Figure 1.



Figure 1 Project Site (Source: DFP/Nearthmap)

The regional context of the project site is shown in **Figure 2** and includes the following:

- **Fairfield Hospital:** Located approximately 250m to the north of the Fairfield Showground Precinct are Braeside and Fairfield Hospital.
- **Fairfield City Golf Club:** Also located to the north of the site, the Fairfield City Golf Club is an 18-hole golf course, inclusive of a driving range and associated club house.
- **Wetherill Park Shopping Centre:** Located approximately 600m to the north east of the site is the Stockland Wetherill Park Shopping Centre
- **Mackillop Catholic College:** To the east of the site is Mackillop Catholic College, being an independent Catholic school for girls.
- **Deerbush Park:** To the site of the site is Deerbush Park. In the broader context of land to the south of the site are a range of low-medium density residential developments.
- **Transport Corridors:** The key regional transport corridors in proximity to the project site are:
 - Smithfield Road – Smithfield Road adjoins the eastern side of the site. A number of bus services travel along Smithfield Road, notably from Parramatta Station (Stand B2).
 - Cumberland Highway – The Cumberland Highway is located approximately 1.5km to the east of the site.

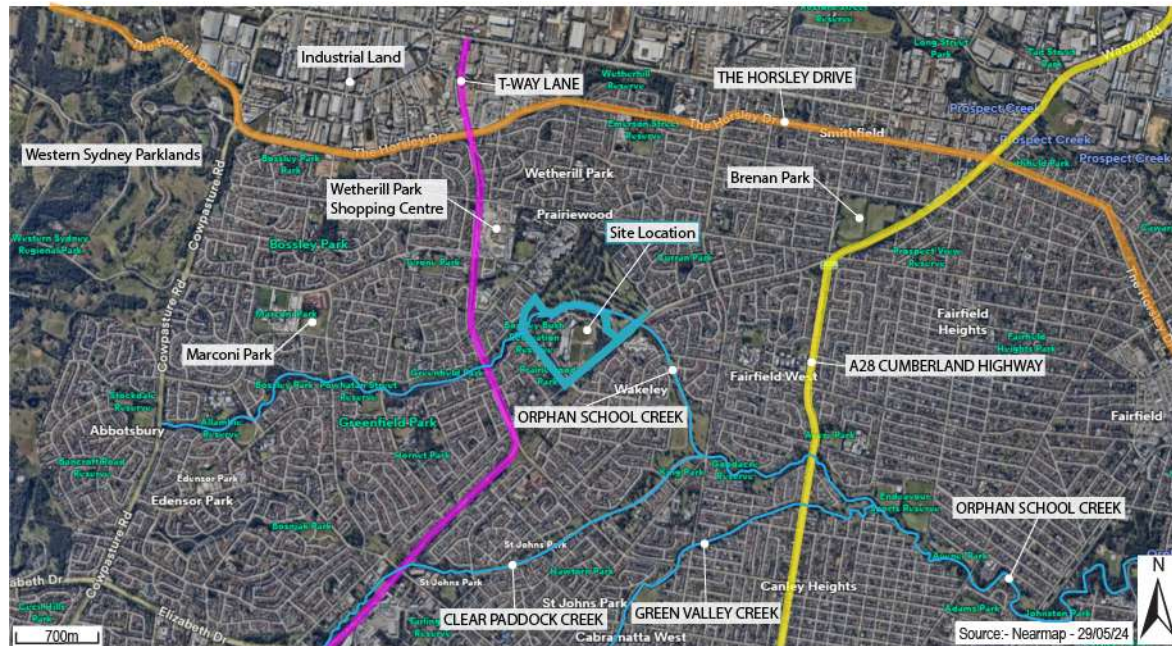


Figure 2 Regional Context (Source: DFP/Nearmap)

1.4 Project Description

- 1.5 The project forms part of a masterplan located on the Fairfield Showground site which will comprise works to be carried out under multiple planning pathways.
- 1.6 The proposed Community and Event Centre and associated civil and landscape works will be considered under the State Significant Development Application (SSDA) planning pathway.
- 1.7 The reminder site and infrastructure will be consider under this (Part 5/REF) planning pathway. The proposed extent of work to be carried under this REF will include:
 - Demolition of six small ancillary buildings and construction of a new amenities block;
 - Road and car parking upgrades and new car parking area;
 - New kiosk/substation; and
 - Associated civil and landscape works.
- 1.8 Below figure details the masterplan and the delineation between the Part 5 and SSDA extent of physical works.

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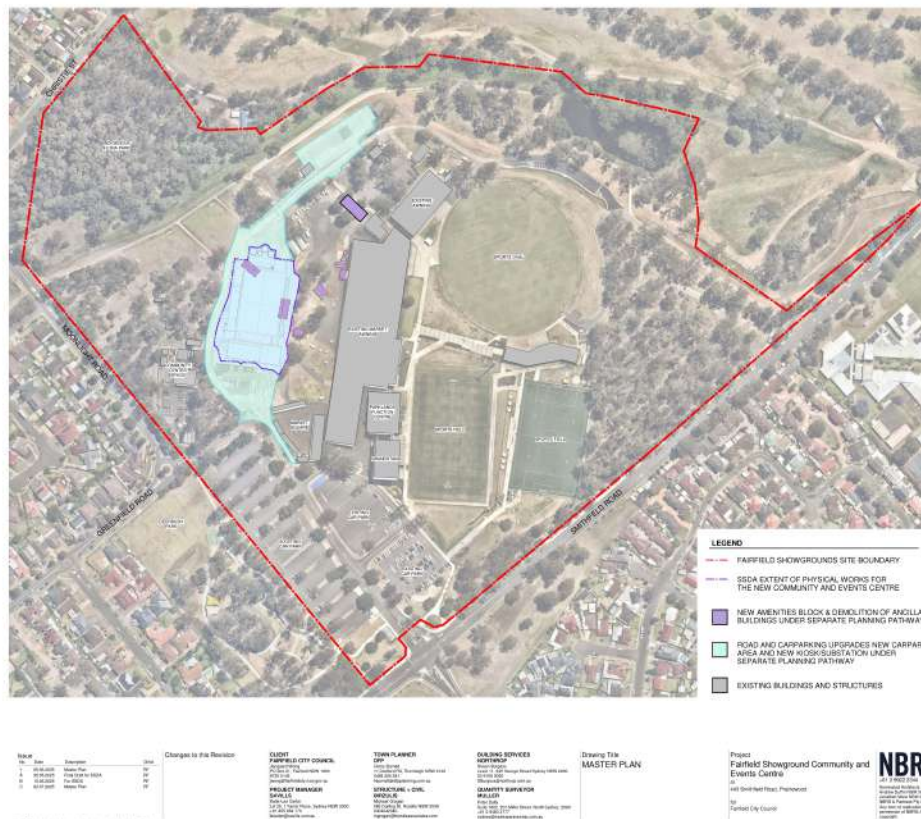


Figure 3: Masterplan (Source: NBRS)

1.9 Below is a list of all documents and information provided to assist in preparing the report;

- Detail and Level Survey, Fairfield City Council, 17 March 2025.
- Architectural Package, NBRS, Revision C - 9 July 2025.
- Combined Services Drawings, Northrop, Revision A - 31 March 2025
- Water Management Plan, Birzulis Associates, Issue P7 - 5 August 2025.
- Landscape Package, NBRS, Revision C - 10 July 2025.

1.10 The site and tree inspections were initially carried out on 9 June 2021 (tree 1-76) and 17 January 2022 (tree 77-116). The trees were re-inspected on 19 September 2024. Tree 117-137 were added during a site inspection on 15 April 2025. Access was available to the subject site and the adjoining public areas only.

1.11 Record of report revisions;

Revision	Date	Report Reference
N/A	15/4/25	250415_FSGSD_AIAd
1	28/4/25	250422_FSGSD_AIAd
2	2/6/25	250602_FSGSD_AIAd

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Final for Submission	7/8/25	250807_FSGSD_AIA
Final for Submission V1	19/8/25	250819_FSGSD_AIA
Final for Submission V2	20/8/25	250820_FSGSD_AIA

2. SCOPE OF THE REPORT

2.1 This report has been undertaken to meet the following objectives.

- 2.1.1 Conduct a ground level visual assessment of all significant trees located within 10 metres of development works. For the purpose of this report, a significant tree is a tree with a height equal to or greater than 5 metres.
- 2.1.2 Determine the trees estimated contribution years and remaining useful life expectancy and award the trees a retention value.
- 2.1.3 Provide an assessment of the potential impact the proposed development is likely to cause to the condition of the subject trees in accordance with AS4970 Protection of trees on development sites (2009).
- 2.1.4 Specify tree protection measures in accordance with AS4970-2009 for any tree to be retained during the development.

3. LIMITATIONS

- 3.1 The observations and recommendations are based on the site inspections identified in section 1 only. The findings of this report are based on the observations and site conditions at the time of inspection.
- 3.2 All of the observations were carried out from ground level. The accuracy of the assessment of the subject trees structural condition and health is limited to the visibility of the tree at the time of inspection.
- 3.3 The tree inspection was visual from ground level only. No soil or tissue testing was carried out as part of the tree inspection. None of the surrounding surfaces adjacent to trees were lifted or removed during the tree inspections.
- 3.4 Root decay can sometimes be present with no visual indication above ground. It is also impossible to know the extent of any root damage caused by mechanical damage such as underground root cutting during the installation of services without undertaking detailed root investigation. Any form of tree failure due to these activities is beyond the scope of this assessment.
- 3.5 While an assessment of the subject trees estimated useful life expectancy is included in this report, no specific tree risk assessment has been undertaken for any of trees at the site.
- 3.6 The report reflects the subject tree(s) as found on the day of inspection. Any changes to the growing environment of the subject tree, or tree management works beyond those recommended in this report may alter the findings of the report. There is no warranty, expressed or implied, that problems or deficiencies relating to the subject tree, or subject site may not arise in the future.
- 3.7 Tree identification is based on accessible visual characteristics at the time of inspection. As key identifying features are not always available the accuracy of identification is not guaranteed. Where tree species is unknown, it is indicated with an *spp.*
- 3.8 Urban Arbor neither guarantees, nor is it responsible for, the accuracy of information provided by others that is contained within this report.
- 3.9 All diagrams, plans and photographs included in this report are visual aids only and are not to scale unless otherwise indicated.
- 3.10 Alteration of this report invalidates the entire report.

4. METHODOLOGY

- 4.1 The following information was collected during the assessment of the subject tree(s).
- 4.1.1 Tree common name
 - 4.1.2 Tree botanical name
 - 4.1.3 Tree age class
 - 4.1.4 DBH (Trunk/Stem diameter at breast height/1.4m) - millimetres.
 - 4.1.5 Estimated height - metres
 - 4.1.6 Estimated crown spread (radius of crown) - metres
 - 4.1.7 Health
 - 4.1.8 Structural condition
 - 4.1.9 Amenity value
 - 4.1.10 Estimated remaining contribution years (SULE)¹
 - 4.1.11 Retention value (Tree AZ)²
 - 4.1.12 Notes/comments
- 4.2 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer, 1994).³
- 4.3 Trunk diameter was measured using a DBH tape or in some cases estimated. The trunk diameter of all trees in adjoining sites has been estimated. Tree height and tree canopy spread was measured with a clinometer or in some cases estimated. All other measurements were estimations unless otherwise stated. The other tool used during the assessment was a digital camera.
- 4.4 All information was imported into (GIS) PT-mapper pro software. This software was used to measure/calculate all encroachment estimates included in this report.
- 4.5 All DBH measurements, tree protection zones, and structural root zones were calculated in accordance with methods set out in AS4970 Protection of trees on development sites (2009) in a Microsoft Excel spreadsheet.⁴
- 4.6 Details of how the observations in this report have been assessed are listed in the appendices.

¹ Barrell, J. (2001), 'SULE: Its use and status in the new millennium' in *Management of Mature Trees proceedings of the 4th NAAA Workshop*, Sydney, 2001. Barrell.

² Barrell Tree Consultancy, *Tree AZ version 10.10-ANZ*, <http://www.treeaz.com/>.

³ Mattheck, C. & Breloer, H., *The body language of trees - A handbook for failure analysis*, The Stationary Office, London, England (1994).

⁴ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009).

5. GENERAL INFORMATION IN RELATION TO PROTECTING TREES ON DEVELOPMENT SITES

- 5.1 Tree protection zone (TPZ):** The TPZ is the principle means of protecting trees on development sites and is an area required to maintain the viability of trees during development. It is commonly observed that tree roots will extend significantly further than the indicative TPZ, however the TPZ is an area identified in AS4970-2009 to be the area where root loss or disturbance will generally impact the viability of the tree. The TPZ is identified as a restricted area to prevent damage to trees either above or below ground during a development. Where trees are intended to be retained proposed developments must provide an adequate TPZ around trees. The TPZ is set aside for the tree's root zone, trunk and crown and it is essential for the stability and longevity of the tree. The TPZ also incorporates the SRZ (see below for more information about the SRZ). The TPZ is calculated by multiplying the DBH by twelve, with the exception of palms, other monocots, cycads, and tree ferns, the TPZ of which have been calculated at one metre outside the crown projection. Additional information about the TPZ is included in Appendix 3.
- 5.2 Structural Root Zone (SRZ):** This is the area around the base of a tree required for the trees stability in the ground. An area larger than the SRZ always needs to be maintained to preserve a viable tree. The SRZ is calculated using the following formula; $(DAB \times 50)^{0.42} \times 0.64$. There are several factors that can vary the SRZ which include height, crown area, soil type and soil moisture. It can also be influenced by other factors such as natural or built structures. Generally, work within the SRZ should be avoided. Soil level changes should also generally be avoided inside the SRZ of trees to be retained. Palms, other monocots, cycads, and tree ferns do not have an SRZ. See the appendices for more information about the SRZ.
- 5.3 Minor encroachment into TPZ:** Sometimes encroachment into the TPZ is unavoidable. Encroachment includes but is not limited to activities such as excavation, compacted fill, and machine trenching. Minor encroachment of up to 10% of the overall TPZ area is normally considered acceptable, providing there is space adjacent to the TPZ for the tree to compensate and the tree is displaying adequate vigour/health to tolerate changes to its growing environment.

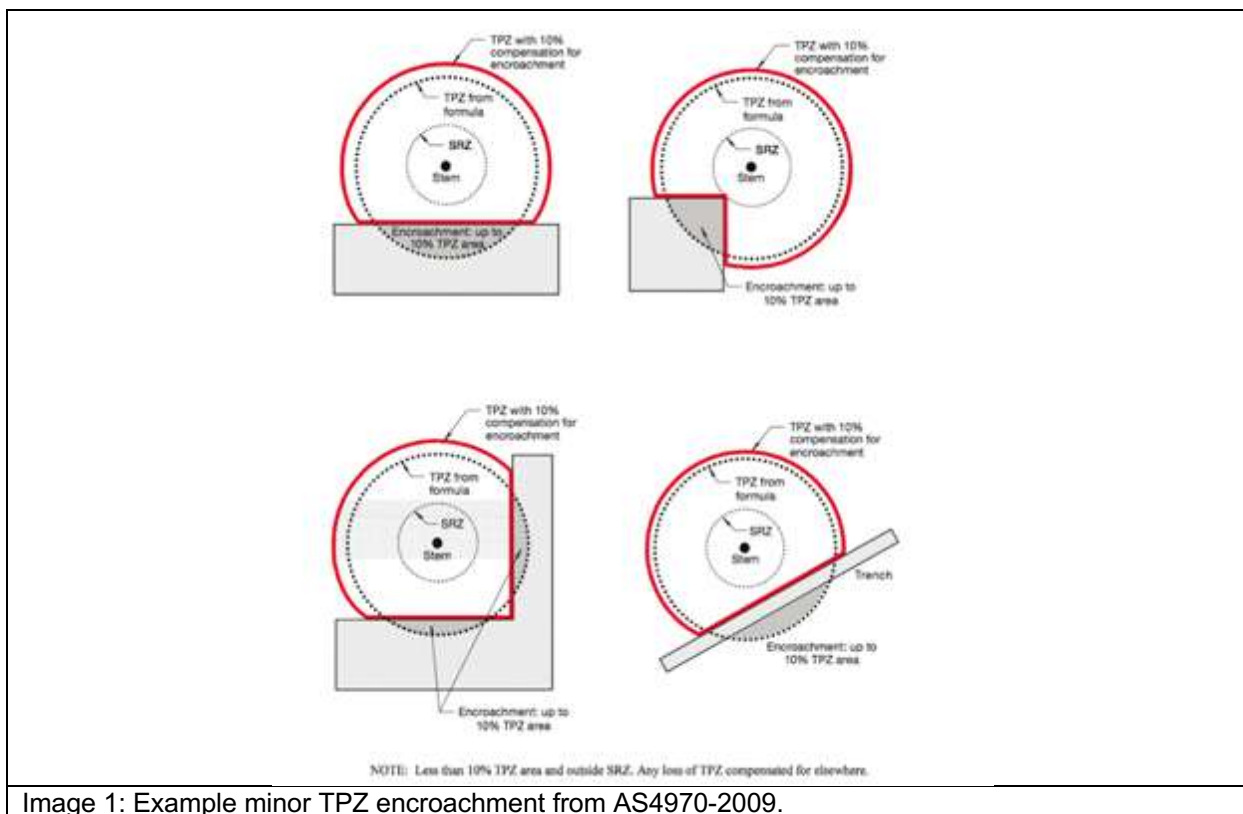


Image 1: Example minor TPZ encroachment from AS4970-2009.

5.4 Major encroachment into TPZ: Where encroachment of more than 10% of the overall TPZ area is proposed the project Arborist must investigate and demonstrate that the tree will remain in a viable condition. In some cases, tree sensitive construction methods such as pier and beam footings, suspended slabs, or cantilevered sections, can be utilised to allow additional encroachment into the TPZ by bridging over roots and minimising root disturbance. Major encroachment is only possible if it can be undertaken without severing significant size roots, or if it can be demonstrated that significant roots will not be impacted. Root investigations may be required to identify roots that will be impacted during major TPZ encroachment (see Appendix 3 for more information in relation to root investigations).

6. OBSERVATIONS

- 6.1 **Tree information:** Details of each individual tree assessed, including the observations taken during the site inspection, can be found in the tree inspection schedule in Appendix 2, where the indicative tree protection zone (TPZ) and Structural Root Zone (SRZ) has been calculated for each of the subject trees. The TPZ and SRZ should be measured in radius from the centre of the trunk. Each of the subject trees have been awarded a retention value based on the observations using the Tree AZ method. Tree AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The Tree AZ categories sheet (Barrell Tree Consultancy) has been included in Appendix 3 to assist with understanding the retention values. The retention value that has been allocated to the subject trees in this report is not definitive and should only be used as a guideline.
- 6.2 **Site plan:** In appendix 1 two site plans have been prepared, where the tree information including canopy spread, TPZ and SRZ have been overlaid onto the site plans. The following site plans are included;
- Appendix 1A: Existing site plan
 - Appendix 1B: Proposed site plan (prepared by NBRS)

7. ASSESSMENT OF CONSTRUCTION IMPACTS

7.1 Table 1: In the table below, the impact of the proposed development has been assessed for all trees included in the report. The assessed TPZ encroachments include proposed structures, services and hard landscaping only. All soft landscaping should be completed in accordance with 10.10.

Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	<i>Casuarina glauca</i>	A1	7.7	186.3	2.9	None	No proposed encroachment into the TPZ as part of the SSDA works. The tree is approved to be removed as part of the ancillary building works that form a part of separate REF application.	Remove REF A/B
2	<i>Casuarina glauca</i>	A1	8.2	211.2	3.0	None	No proposed encroachment into the TPZ as part of the SSDA works. The tree is approved to be removed as part of the ancillary building works that form a part of separate REF application.	Remove REF A/B
3	<i>Callistemon salignus</i>	A2	4.2	55.4	2.2	None	No proposed encroachment into the TPZ.	Retain and protect
4	<i>Eucalyptus tereticornis</i>	A2	7.3	167.4	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
5	<i>Eucalyptus tereticornis</i>	A1	6.0	113.1	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
6	<i>Eucalyptus tereticornis</i>	A2	6.7	141.0	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
7	<i>Eucalyptus moluccana</i>	Z9	8.1	206.1	3.2	None	No proposed encroachment into the TPZ.	Retain and protect
8	<i>Eucalyptus moluccana</i>	AA	8.5	227.0	3.1	None	No proposed encroachment into the TPZ.	Retain and protect
9	<i>Eucalyptus moluccana</i>	AA	7.2	162.9	2.9	Minor	Proposed hard surfacing, services and a retaining wall will encroach into the TPZ by 4% (6.7m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
10	<i>Eucalyptus moluccana</i>	AA	7.1	158.4	2.8	Minor	Proposed hard surfacing, services and a retaining wall will encroach into the TPZ by 9% (14.6m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect

Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
11	<i>Eucalyptus moluccana</i>	A2	5.8	105.7	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
12	<i>Eucalyptus fibrosa</i>	AA	8.0	201.1	3.0	None	No proposed encroachment into the TPZ.	Retain and protect
13	<i>Eucalyptus fibrosa</i>	Z10	4.7	69.4	2.3	None	No proposed encroachment into the TPZ.	Retain and protect
14	<i>Eucalyptus moluccana</i>	Z4	5.3	88.2	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
15	<i>Eucalyptus fibrosa</i>	AA	6.5	132.7	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
16	<i>Eucalyptus fibrosa</i>	AA	6.1	116.9	2.7	None	No proposed encroachment into the TPZ.	Retain and protect
17	<i>Eucalyptus moluccana</i>	Z9	12.5	490.9	3.5	Footprint	The trunk is located within the footprint of a proposed building.	Remove
18	<i>Eucalyptus fibrosa</i>	AA	11.4	408.3	3.4	Footprint	The trunk is located within the footprint of a proposed building.	Remove
19	<i>Eucalyptus fibrosa</i>	A1	6.0	113.1	2.7	Footprint	The trunk is located within the footprint of a proposed building.	Remove
20	<i>Eucalyptus fibrosa</i>	AA	6.8	145.3	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
21	<i>Eucalyptus fibrosa</i>	A2	8.7	237.8	3.1	None	No proposed encroachment into the TPZ.	Retain and protect
22	<i>Eucalyptus fibrosa</i>	AA	7.8	191.1	2.9	None	No proposed encroachment into the TPZ.	Retain and protect

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23	<i>Eucalyptus fibrosa</i>	Z9	8.3	216.4	3.0	Major	A proposed retaining wall encroaches into the TPZ by 42% (89.9m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition of the tree will potentially be impacted.	Remove
24	<i>Eucalyptus fibrosa</i>	A2	8.9	248.8	3.2	Major	A proposed retaining wall encroaches into the TPZ by 42% (82.9m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition of the tree will potentially be impacted.	Remove REF O/C
25	<i>Eucalyptus moluccana</i>	AA	11.3	401.1	3.4	Footprint	The trunk is located within the footprint of a proposed building.	Remove
26	<i>Ulmus parviflora</i>	Z1	2.3	16.6	1.8	Footprint	The trunk is located within the footprint of a proposed building.	Remove
27	<i>Ulmus parviflora</i>	Z1	2.8	24.6	1.9	Footprint	The trunk is located within the footprint of a proposed building.	Remove
28	<i>Eucalyptus moluccana</i>	AA	9.7	295.6	3.2	Footprint	The trunk is located within the footprint of a proposed hard surfacing.	Remove
29	<i>Eucalyptus tereticornis</i>	Z5	4.7	69.4	2.3	Footprint	No proposed encroachment into the TPZ. The tree was in poor condition at the time of inspection and not suitable for retention.	Remove REF O/C
30	<i>Eucalyptus moluccana</i>	AA	5.3	88.2	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
31	<i>Eucalyptus moluccana</i>	Z10	5.3	88.2	2.5	Minor	A proposed service pipe will encroach into the TPZ by 5% (4.2m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
32	<i>Eucalyptus moluccana</i>	A2	7.1	158.4	2.8	Minor	A proposed road and services will encroach into the TPZ by 10% (15.1m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
33	<i>Eucalyptus moluccana</i>	AA	4.2	55.4	2.3	None	No proposed encroachment into the TPZ.	Retain and protect
34	<i>Eucalyptus moluccana</i>	A2	11.3	401.1	3.5	Major	The majority of the TPZ is covered by existing heavily compacted gravel/road base in use as a car park. A proposed building and OSD tank	Tree sensitive services #

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
							will encroach into the TPZ by 12% (47.8m ²) but not into the SRZ, which is major TPZ encroachment. However, it is only 2% over the threshold of minor encroachment, indicating that the overall root loss will be acceptable and not significantly impact the tree's life expectancy. Measures can be undertaken to offset the impact of root loss, such as installing temporary irrigation during and post development works to stimulate new root growth. A proposed footpath will encroach into the TPZ by a further 30% (121.2m ²) but not into the SRZ, which is major TPZ encroachment. However, this area is covered by an existing footpath and the proposed footpath will be constructed above the grade of the existing footpath, indicating that the tree will not be impacted. Underground services are also proposed in the TPZ. To retain the tree in a viable, all underground services in the TPZ must be installed via tree sensitive methods in accordance with AS4970-2009, see section 8.2 for more information.	
35	<i>Eucalyptus moluccana</i>	Z4	5.0	78.5	2.5	Major	A proposed footpath will encroach into the TPZ by 33% (26m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition of the tree will potentially be impacted. The tree was in decline at the time of inspection and not suitable for retention.	Remove REF O/C
36	<i>Eucalyptus tereticornis</i>	Z11	6.6	136.8	2.7	Minor	A proposed footpath will encroach into the TPZ by 7% (9.3m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
37	<i>Corymbia maculata</i>	AA	6.0	113.1	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
38	<i>Eucalyptus tereticornis</i>	Z5	7.2	162.9	2.8	Minor	A proposed footpath will encroach into the TPZ by 8% (13.6m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. The tree was in poor condition at the time of inspection and not suitable for retention.	Remove REF O/C

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
39	<i>Eucalyptus fibrosa</i>	Z4	5.5	95.0	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
40	<i>Eucalyptus tereticornis</i>	Z10	14.1	624.6	3.7	Minor	A proposed footpath will encroach into the TPZ by 2% (14m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
41	<i>Eucalyptus tereticornis</i>	AA	11.4	408.3	3.4	Minor	A proposed footpath will encroach into the TPZ by 8% (33.6m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
42	<i>Eucalyptus moluccana</i>	AA	12.1	460.0	3.9	None	No proposed encroachment into the TPZ.	Retain and protect
43	<i>Eucalyptus moluccana</i>	AA	15.0	706.9	3.8	None	No proposed encroachment into the TPZ.	Retain and protect
44	<i>Brachychiton populneus</i>	Z1	3.1	30.2	2.0	None	No proposed encroachment into the TPZ.	Retain and protect
45	<i>Brachychiton populneus</i>	A1	4.4	60.8	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
46	<i>Melaleuca quinquenervia</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
47	<i>Casuarina glauca</i>	A1	4.4	60.8	2.3	None	No proposed encroachment into the TPZ.	Retain and protect
48	<i>Casuarina glauca</i>	A1	6.7	141.0	2.7	None	No proposed encroachment into the TPZ.	Retain and protect
49	<i>Eucalyptus moluccana</i>	AA	5.8	105.7	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
50	<i>Eucalyptus moluccana</i>	A2	7.0	153.9	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
51	<i>Eucalyptus moluccana</i>	AA	6.5	132.7	2.8	None	No proposed encroachment into the TPZ.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
52	<i>Melaleuca linariifolia</i>	Z1	2.4	18.1	1.7	None	No proposed encroachment into the TPZ.	Retain and protect
53	<i>Jacaranda mimosifolia</i>	Z1	2.8	24.6	1.8	None	No proposed encroachment into the TPZ.	Retain and protect
54	<i>Brachychiton acerifolius</i>	A2	3.5	38.5	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
55	<i>Eucalyptus microcorys</i>	A1	5.0	78.5	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
56	<i>Brachychiton acerifolius</i>	Z10	3.0	28.3	1.9	None	No proposed encroachment into the TPZ.	Retain and protect
57	<i>Grevillea robusta</i>	Z4	2.0	12.6	1.6	None	No proposed encroachment into the TPZ.	Retain and protect
58	<i>Eucalyptus moluccana</i>	A2	8.9	248.8	3.2	None	No proposed encroachment into the TPZ.	Retain and protect
59	<i>Eucalyptus moluccana</i>	AA	4.8	72.4	2.4	None	No proposed encroachment into the TPZ.	Retain and protect
60	<i>Eucalyptus moluccana</i>	AA	7.6	181.5	2.9	None	No proposed encroachment into the TPZ.	Retain and protect
61	<i>Eucalyptus moluccana</i>	A2	7.8	191.1	3.0	None	No proposed encroachment into the TPZ.	Retain and protect
62	<i>Eucalyptus moluccana</i>	AA	5.2	84.9	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
63	<i>Eucalyptus moluccana</i>	A2	6.8	145.3	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
64	<i>Eucalyptus moluccana</i>	A2	10.3	333.3	3.2	None	No proposed encroachment into the TPZ.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
65	<i>Eucalyptus moluccana</i>	A1	6.0	113.1	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
66	<i>Eucalyptus moluccana</i>	AA	9.0	254.5	3.1	None	No proposed encroachment into the TPZ.	Retain and protect
67	<i>Eucalyptus moluccana</i>	AA	8.1	206.1	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
68	<i>Eucalyptus moluccana</i>	A2	6.2	120.8	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
69	<i>Eucalyptus moluccana</i>	A2	7.7	186.3	2.9	None	No proposed encroachment into the TPZ.	Retain and protect
70	<i>Brachychiton acerifolius</i>	A1	4.0	50.3	2.2	None	No proposed encroachment into the TPZ.	Retain and protect
71	<i>Eucalyptus moluccana</i>	A2	6.2	120.8	2.7	None	No proposed encroachment into the TPZ.	Retain and protect
72	<i>Eucalyptus moluccana</i>	AA	8.4	221.7	3.0	None	No proposed encroachment into the TPZ.	Retain and protect
73	<i>Eucalyptus moluccana</i>	AA	6.8	145.3	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
74	<i>Eucalyptus moluccana</i>	A2	10.0	314.2	3.2	None	No proposed encroachment into the TPZ.	Retain and protect
75	<i>Corymbia maculata</i>	AA	7.9	196.1	3.0	None	No proposed encroachment into the TPZ.	Retain and protect
76	<i>Eucalyptus moluccana</i>	A2	12.5	490.9	3.2	None	No proposed encroachment into the TPZ.	Retain and protect
77	<i>Castanospermum australe</i>	Z1	2.6	21.2	1.9	Footprint	The trunk is located within the footprint of a proposed building.	Remove

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78	<i>Melaleuca styphelioides</i>	Z1	2.6	21.2	1.7	Footprint	The trunk is located within the footprint of a proposed building.	Remove
79	<i>Photinia robusta</i>	Z1	5.0	78.5	2.3	Footprint	The trunk is located within the footprint of a proposed building.	Remove
80	<i>Eucalyptus fibrosa</i>	AA	8.2	211.2	2.9	Major	A proposed retaining wall encroaches into the TPZ by 37% (77.2m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition of the tree will potentially be impacted.	Remove REF O/C
81	<i>Corymbia maculata</i>	A1	2.8	24.6	1.9	Footprint	The trunk is located within the footprint of the proposed hard surfacing.	Remove REF O/C
82	<i>Eucalyptus fibrosa</i>	A2	10.4	339.8	3.3	Footprint	The trunk is located within the footprint of the proposed hard surfacing.	Remove REF O/C
83	<i>Melia azedarach</i>	Z1	2.8	24.6	1.8	Footprint	The trunk is located within the footprint of a proposed building.	Remove
84	<i>Corymbia maculata</i>	A1	3.5	38.5	2.1	Footprint	The trunk is located within the footprint of a proposed building.	Remove
85	<i>Corymbia maculata</i>	A1	2.3	16.6	1.8	Footprint	The trunk is located within the footprint of the proposed hard surfacing.	Remove REF O/C
86	<i>Corymbia maculata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed hard surfacing.	Remove REF O/C
87	<i>Corymbia maculata</i>	A1	2.8	24.6	1.8	Minor	Proposed hard surfacing and a retaining wall will encroach into the TPZ by less than 10% (<1m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
88	<i>Corymbia maculata</i>	A2	2.6	21.2	1.8	Minor	Proposed hard surfacing and a retaining wall will encroach into the TPZ by less than 10% (<1m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
89	<i>Corymbia maculata</i>	Z1	2.0	12.6	1.5	Minor	Proposed hard surfacing and a retaining wall will encroach into the TPZ by less than 10% (<1m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
90	<i>Corymbia maculata</i>	AA	10.9	373.3	3.3	Major	The trunk is located within an existing planter bed, with existing hard surfacing/bitumen occupying the majority of the TPZ. Proposed hard surfacing (car park and paving) will encroach into the TPZ by 26% (98.6m ²) but not into the SRZ, which is major TPZ encroachment. However, all of the proposed hard surfacing will be located within the footprint of existing hard surfacing/bitumen, indicating that the tree will not be significantly impacted. To minimise the impact to the tree, the modifications to the bitumen/car park should be carried out via tree sensitive methods, including retaining the lowest levels of existing sub-base to minimise root disturbance. Underground services are also proposed in the TPZ. To retain the tree in a viable, all underground services in the TPZ must be installed via tree sensitive methods in accordance with AS4970-2009, see section 8.2 for more information.	Tree sensitive road/car park & services
91	<i>Eucalyptus fibrosa</i>	AA	8.2	211.2	3.4	Major	The trunk is located within an existing planter bed, with existing hard surfacing/bitumen occupying the majority of the TPZ. Proposed hard surfacing (car park and road) will encroach into the TPZ by 27% (57.2m ²) but not into the SRZ, which is major TPZ encroachment. However, all of the proposed hard surfacing will be located within the footprint of existing hard surfacing/bitumen, indicating that the tree will not be significantly impacted. To minimise the impact to the tree, the modifications to the bitumen/car park should be carried out via tree sensitive methods, including retaining the lowest levels of existing sub-base to minimise root disturbance.	Tree sensitive road/car park
92	<i>Ficus benjamina</i>	A1	6.6	136.8	2.6	Major	An existing road is located in the TPZ and SRZ. A proposed road will be aligned approximately 2.5m closer to the trunk, which will encroach into the TPZ by 44% (60.7m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition of the tree will potentially be impacted.	Remove REF O/C
93	<i>Eucalyptus fibrosa</i>	Z4	5.5	95.0	2.5	None	No proposed encroachment into the TPZ.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
94	<i>Eucalyptus fibrosa</i>	AA	6.9	149.6	3.0	Major	An existing road is located in the TPZ. A proposed road will be aligned approximately 2.5m closer to trunk, which will encroach into the TPZ by 13% (18.8m ²) but not into the SRZ, which is major TPZ encroachment. However, it is only 3% over the threshold of minor encroachment, indicating that the overall root loss will be acceptable and not significantly impact the tree's life expectancy. Measures can be undertaken to offset the impact of root loss, such as installing temporary irrigation during and post development works to stimulate new root growth. The tree can be retained in a viable condition.	Retain and protect#
95	<i>Eucalyptus fibrosa</i>	AA	5.8	105.7	2.6	Minor	A proposed road will encroach into the TPZ by 7% (7.4m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
96	<i>Eucalyptus fibrosa</i>	Z10	2.4	18.1	1.8	Major	An existing road is located in the TPZ. A proposed road will be aligned approximately 2.5m closer to the trunk, which will encroach into the TPZ by 17% (3m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition of the tree will potentially be impacted.	Remove REF O/C
97	<i>Eucalyptus fibrosa</i>	AA	7.1	158.4	2.8	Major	An existing road is located in the TPZ and SRZ, the existing road occupies 35% (54.7m ²) of the TPZ area. A new road is proposed to replace the existing road in the TPZ, the proposed road will be located within the footprint of the existing road in the TPZ. To minimise the impact to the tree, the modifications to the bitumen/car park should be carried out via tree sensitive methods, including retaining the lowest levels of existing sub-base to minimise root disturbance.	Tree sensitive road/car park
98	<i>Corymbia maculata</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
99	<i>Corymbia maculata</i>	A1	2.2	15.2	1.7	None	No proposed encroachment into the TPZ.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
100	<i>Corymbia maculata</i>	Z10	2.0	12.6	1.6	None	No proposed encroachment into the TPZ.	Retain and protect
101	<i>Eucalyptus fibrosa</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
102	<i>Eucalyptus fibrosa</i>	AA	7.6	181.5	2.8	Major	An existing road is located in the TPZ and SRZ and occupies 39% (70.7m ²) of the TPZ area. A new road is proposed to replace the existing road in the TPZ, the proposed road will be located within the footprint of the existing road in the TPZ. To minimise the impact to the tree, the modifications to the bitumen/car park should be carried out via tree sensitive methods, including retaining the lowest levels of existing sub-base to minimise root disturbance.	Tree sensitive road/car park
103	<i>Corymbia maculata</i>	A2	7.8	191.1	2.9	None	No proposed encroachment into the TPZ.	Retain and protect
104	<i>Eucalyptus moluccana</i>	AA	7.5	176.7	3.2	Major	An existing road is located in the TPZ and occupies 21% (37.2m ²) of the TPZ area. A new road is proposed to replace the existing road in the TPZ, the proposed road will be located within the footprint of the existing road in the TPZ. To minimise the impact to the tree, the modifications to the bitumen/car park should be carried out via tree sensitive methods, including retaining the lowest levels of existing sub-base to minimise root disturbance.	Tree sensitive road/car park
105	<i>Eucalyptus moluccana</i>	AA	5.8	105.7	2.5	Minor	A proposed road will encroach into the TPZ by 9% (9.6m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
106	<i>Corymbia maculata</i>	A2	8.9	248.8	3.2	Minor	A proposed road will encroach into the TPZ by 5% (13.5m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect

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107	<i>Corymbia maculata</i>	AA	7.2	162.9	2.8	Minor	A proposed road will encroach into the TPZ by 3% (5.4m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
108	<i>Eucalyptus tereticornis</i>	A2	6.6	136.8	2.8	Minor	A proposed road will encroach into the TPZ by 6% (7.6m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
109	<i>Eucalyptus moluccana</i>	Z10	4.0	50.3	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
110	<i>Eucalyptus moluccana</i>	AA	7.7	186.3	3.2	None	No proposed encroachment into the TPZ.	Retain and protect
111	<i>Eucalyptus moluccana</i>	A1	7.2	162.9	2.7	None	No proposed encroachment into the TPZ.	Retain and protect
112	<i>Eucalyptus moluccana</i>	AA	11.1	387.1	3.3	None	No proposed encroachment into the TPZ.	Retain and protect
113	<i>Eucalyptus moluccana</i>	A1	8.5	227.0	3.1	None	No proposed encroachment into the TPZ.	Retain and protect
114	<i>Corymbia maculata</i>	A2	9.0	254.5	3.2	None	No proposed encroachment into the TPZ.	Retain and protect
115	<i>Eucalyptus moluccana</i>	A1	8.4	221.7	3.1	None	No proposed encroachment into the TPZ.	Retain and protect
116	<i>Corymbia maculata</i>	A1	5.4	91.6	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
117	Dead Tree	Z4	8.2	211.2	2.9	None	No proposed encroachment into the TPZ.	Retain and protect
118	<i>Eucalyptus moluccana</i>	A1	4.4	60.8	2.3	None	No proposed encroachment into the TPZ.	Retain and protect
119	<i>Eucalyptus microcorys</i>	A1	5.1	81.7	2.2	None	No proposed encroachment into the TPZ.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
120	<i>Eucalyptus moluccana</i>	AA	8.1	206.1	3.3	None	No proposed encroachment into the TPZ.	Retain and protect
121	<i>Corymbia maculata</i>	A2	4.7	69.4	2.4	None	No proposed encroachment into the TPZ.	Retain and protect
122	<i>Eucalyptus moluccana</i>	A1	5.9	109.4	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
123	<i>Eucalyptus moluccana</i>	A1	5.8	105.7	2.7	None	No proposed encroachment into the TPZ.	Retain and protect
124	<i>Eucalyptus moluccana</i>	A1	5.6	98.5	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
125	<i>Eucalyptus moluccana</i>	AA	9.8	301.7	3.2	None	No proposed encroachment into the TPZ.	Retain and protect
126	<i>Eucalyptus moluccana</i>	A1	8.6	232.4	3.1	None	No proposed encroachment into the TPZ.	Retain and protect
127	<i>Corymbia maculata</i>	Z10	3.5	38.5	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
128	Dead Tree	Z4	7.4	172.0	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
129	<i>Corymbia maculata</i>	A1	5.0	78.5	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
130	Dead Tree	Z4	9.7	295.6	3.5	None	No proposed encroachment into the TPZ.	Retain and protect
131	<i>Eucalyptus moluccana</i>	A1	5.6	98.5	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
132	<i>Eucalyptus moluccana</i>	A1	6.5	132.7	2.7	None	No proposed encroachment into the TPZ.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
133	<i>Corymbia maculata</i>	A2	6.8	145.3	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
134	<i>Eucalyptus tereticornis</i>	A4	7.1	158.4	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
135	<i>Eucalyptus moluccana</i>	AA	10.1	320.5	3.3	None	No proposed encroachment into the TPZ.	Retain and protect
136	<i>Eucalyptus moluccana</i>	Z10	6.0	113.1	2.6	None	No proposed encroachment into the TPZ.	Retain and protect
137	<i>Eucalyptus moluccana</i>	A2	9.4	277.6	3.1	None	No proposed encroachment into the TPZ.	Retain and protect
138	<i>Eucalyptus crebra</i>	A1	5.0	78.5	2.4	Major	An existing footpath will be replaced in the TPZ and SRZ, the proposed footpath will encroach into the TPZ by 17% (13.3m ²) but not into the SRZ, which is major TPZ encroachment. To minimise the impact to the tree, the proposed footpath should be replaced at the same grade as the existing footpath to minimise root disturbance.	Tree sensitive footpath

Notes:

- # = Measures can be undertaken to offset the impact of root loss, such as installing temporary irrigation during and post development works to stimulate new root growth.
- Remove REF A/B = The tree is approved to be removed as part of the ancillary building works that form a part of separate REF application.
- Remove REF O/C = The tree is proposed to be removed as part of the overflow carpark works that form a part of separate REF application.

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8. CONCLUSIONS

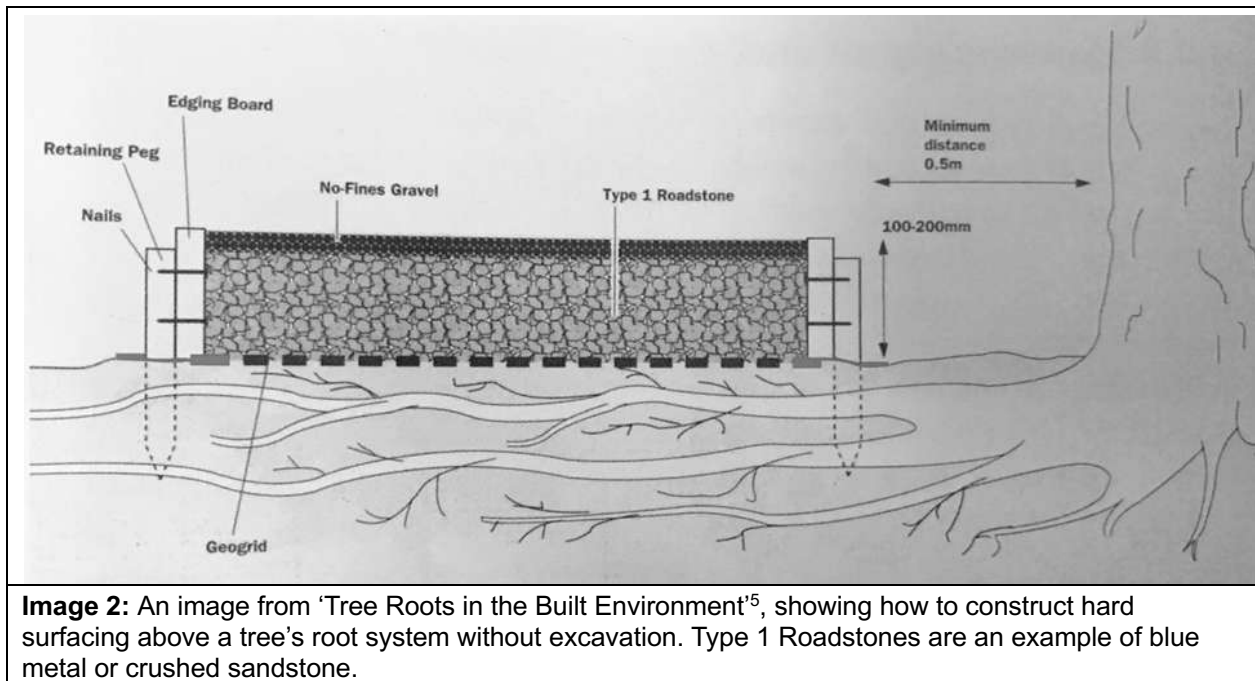
8.1 Table 2: Summary of the impact to trees by the development;

Impact	Reason	Category A Tree numbers		Category Z Tree numbers	Total trees
		AA	A	Z	
Trees recommended to be removed for SSDA application	Building construction, new surfacing and/or proximity to proposed structures	18, 25, 28 (three trees)	19, 84 (two trees)	17, 23, 26, 27, 77, 78, 79, 83 (eight trees)	13 trees
Other trees approved/proposed to be removed for ancillary buildings and overflow carpark REF	Building construction, new surfacing and/or proximity to proposed structures	80 (one tree)	1, 2, 24, 81, 82, 85, 92 (seven trees)	29, 35, 38, 86, 96 (five trees)	13 trees
Trees requiring tree sensitive construction to be retained in a viable condition	Removal of existing surfacing/structures and/or installation of new surfacing/structures could impact the viability of the trees	90, 91, 97, 102, 104 (five trees)	34, 138 (Two trees)	None	7 trees
Trees recommended to be retained	Removal of existing surfacing/structures and/or installation of new surfacing/structures will not impact the viability of the trees	8, 9, 10, 12, 15, 16, 20, 22, 30, 33, 37, 41, 42, 43, 49, 51, 59, 60, 62, 66, 67, 72, 73, 75, 94, 95, 105, 107, 110, 112, 120, 125, 135 (Thirty-three trees)	3, 4, 5, 6, 11, 21, 32, 45, 47, 48, 50, 54, 55, 58, 61, 63, 64, 65, 68, 69, 70, 71, 74, 76, 87, 88, 99, 103, 106, 108, 111, 113, 114, 115, 116, 118, 119, 121, 122, 123, 124, 126, 129, 131, 132, 133, 134, 137 (forty-eight trees)	7, 13, 14, 31, 35, 36, 39, 40, 44, 46, 52, 53, 56, 57, 89, 93, 98, 100, 101, 109, 117, 127, 128, 130, 136 (twenty-five trees)	103 trees

8.2 Tree Sensitive Footpath/Hard Surfacing Construction in the TPZ: To minimise the impacts of new footpaths and hard surfacing in the TPZ of trees, tree sensitive construction methods should be used to minimise the impact to roots. The hard surfacing should be constructed above existing grades in the TPZ of the trees. The diagram below (Image 2) gives an example of a no-excavation method for constructing hard surfacing close to trees. The location of retaining pegs should be flexible, avoiding damage to structural roots.

If excavations are essential, the excavations should be supervised by a Project Arborist with a minimum AQF Level 5 qualification. All excavations for the footpath should be carried out manually to avoid impacting retained tree roots. All tree roots greater than 40mm in diameter should be retained unless the Project Arborist has assessed and advised that the pruning/severing of the root will not impact the condition or stability of the tree. Manual excavation may include the use of pneumatic and hydraulic tools, high pressure air, or a combination of high-pressure water and a vacuum device.

Where tree roots greater than 40mm are encountered that must be retained, footpath should be elevated over the individual tree root to allow for its retention. Examples of methods that can be used to bridge individual tree roots have been included below (Image 3 and 4). Using pier and beam bridges as per the image below is the recommended/preferred method, as it will allow for future growth of the tree roots, reducing future damage to the pavement from the roots.



⁵ Roberts, J., Jackson, N., & Smith, M., *Tree Roots in the Built Environment*, The Stationary Office, London, England (2006), page 305 & 306

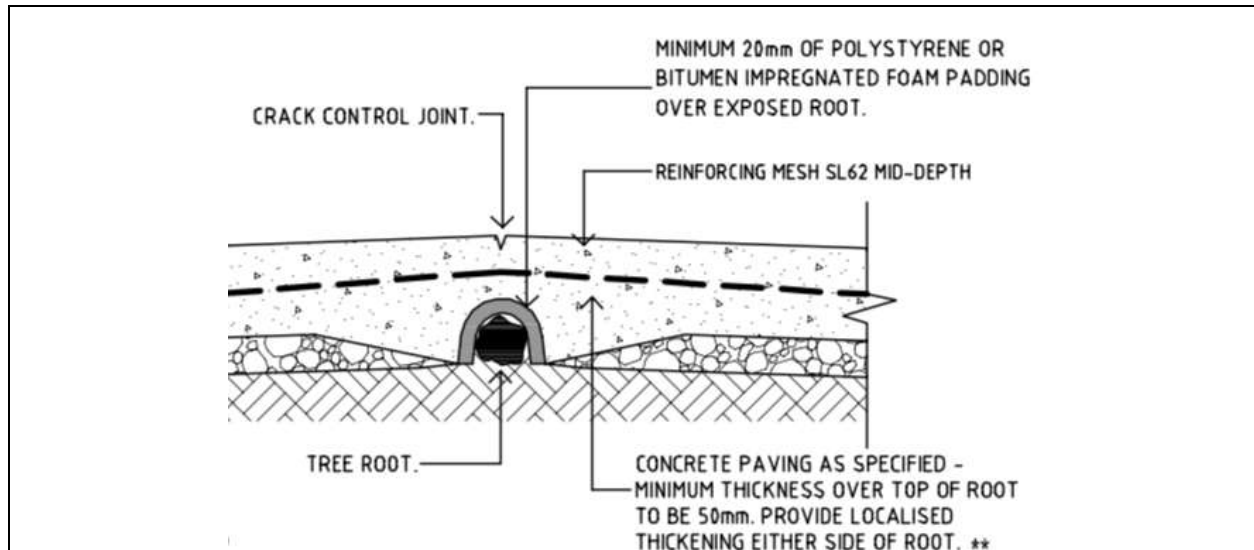


Image 3: Example method for bridging concrete footpaths over tree roots provided in the Canterbury-Bankstown Council standard drawings⁶

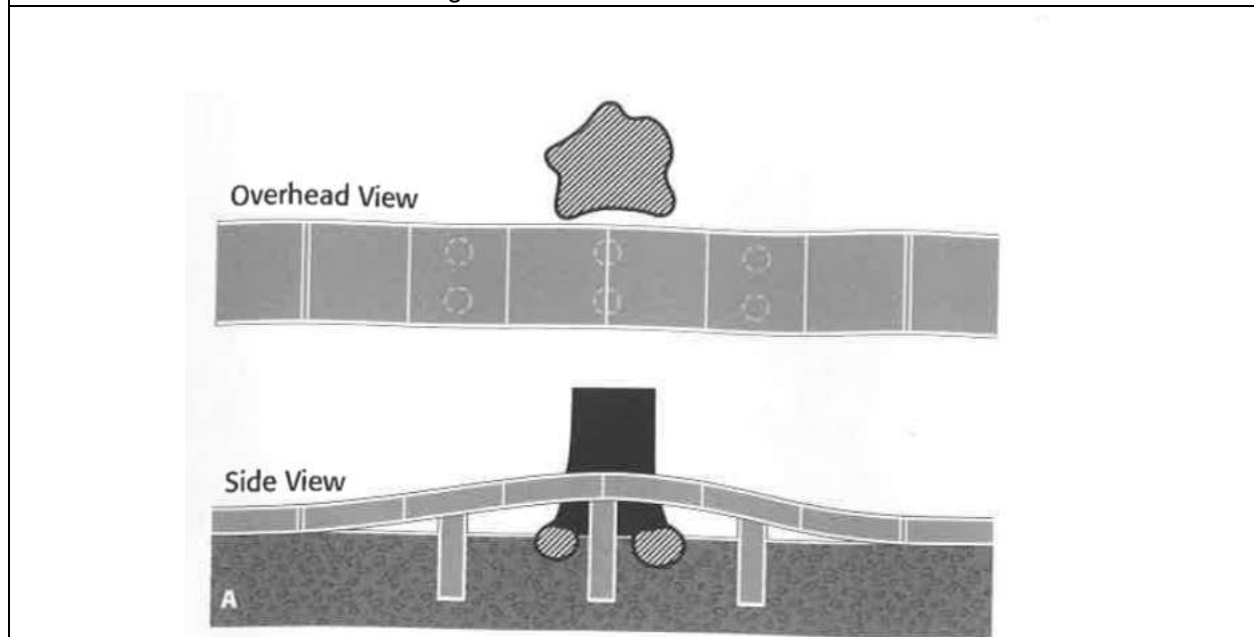


Image 4: Example method from 'Reducing infrastructure damage by tree roots: A compendium of strategies'⁷

8.3 Tree Sensitive Roads/Car Park in the TPZ: The two most likely impacts to trees from construction of the roads and car parks are root severance/loss during excavations/regrading and soil compaction.

⁶ Canterbury-Bankstown Council standard drawing S-209 Existing Street tree treatments, <https://www.cbccity.nsw.gov.au/development/planning-control-policies/council-standard-drawings>, accessed 3 October 2019.

⁷ Costello, L. R., & Jones, K. S., *Reducing infrastructure damage by tree roots: A compendium of strategies*, Western Chapter of the International Society of Arboriculture, 31883 Success Valley Drive, Porterville, CA (2003), page 27.

Ground preparation for the construction of new roads is generally high impact to the root system of trees, as heavy machinery is used to regrade the soil and compact the sub-base and surface, which results in soil compaction and potentially damage surface/shallow roots. Soil compaction restricts the aeration and filtration of water/nutrients to the trees absorbing roots.

In locations where the new road/parking is constructed within the footprint of, and at/or above the grade of the existing road to avoid excavations and root loss, the root system and condition of the trees will not be significantly impacted, as the soil below the existing driveway is already heavily compacted and there will no significant modification to the soil root growth conditions. The lowest levels of existing sub-base material (50-100mm minimum) should be retained where practical to minimise damage to underlying roots.

8.4 Tree Sensitive Underground Services in the TPZ: AS4970 Protection of trees on development sites (2009) recommends that all underground services located inside the TPZ of any tree to be retained should be installed via tree sensitive techniques. This should include either directional drilling methods or manual/non-destructive excavations to minimise the impact to trees identified for retention.

If directional drilling is proposed, section 4.5.5 of AS4970-2009 says that 'The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees'.¹

If manual excavations are proposed, all excavations for the services should be carried out manually under the supervision of the project Arborist (minimum qualification AQF 5). Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. All roots greater than 40mm in diameter should be retained in the service trench. The service pipe should then be threaded below the retained roots where practical. Roots greater than 40mm within the alignment of the service pipe should only be severed/pruned under the approval of the project Arborist. All root pruning should be in accordance with AS4373 Pruning of amenity trees (2007).

8.5 Bulk Earthworks - Soil Level Modifications (Cut and Fill): To minimise the impact of bulk earthworks, all regarding must be avoided in the TPZ wherever practical. The bulk earthworks plan has been assessed in this report. Birzulis Associates have identified specific tree sensitive areas where bulk earthworks/regarding must be avoided in the TPZ of trees. They have also advised that regarding can be avoided/minimised in the TPZ of trees in areas where the depth of cut/fill is +/- 200mm of significant roots will be impacted. To ensure that the trees are not adversely impacted, all bulk earthworks in the TPZ where the depth of cut/fill is +/- 200mm must be in accordance with AS4970-2009 and supervised by the project arborist, significant roots must not be impacted during these works. Bulk earthworks can impact trees for the following reasons.

8.5.1 Cut: A tree's root system is generally located far shallower in the soil than is normally considered, and should be thought of as a 'root plate'. The majority of a tree's root

growth is usually found in the upper 600mm of the soil closest to the surface, but a percentage of the roots will extend deeper in the soil. An image has been included below that is taken from AS4970-2009, and provides an example of the structure of a tree's root system. Any significant cut/lowering the soil level in the TPZ can impact the tree. The only way to identify the precise impact to a tree's root system by cut in the TPZ is by carrying out detailed root investigation to identify the individual significant roots. No detailed root investigations have been undertaken as part of the assessment.

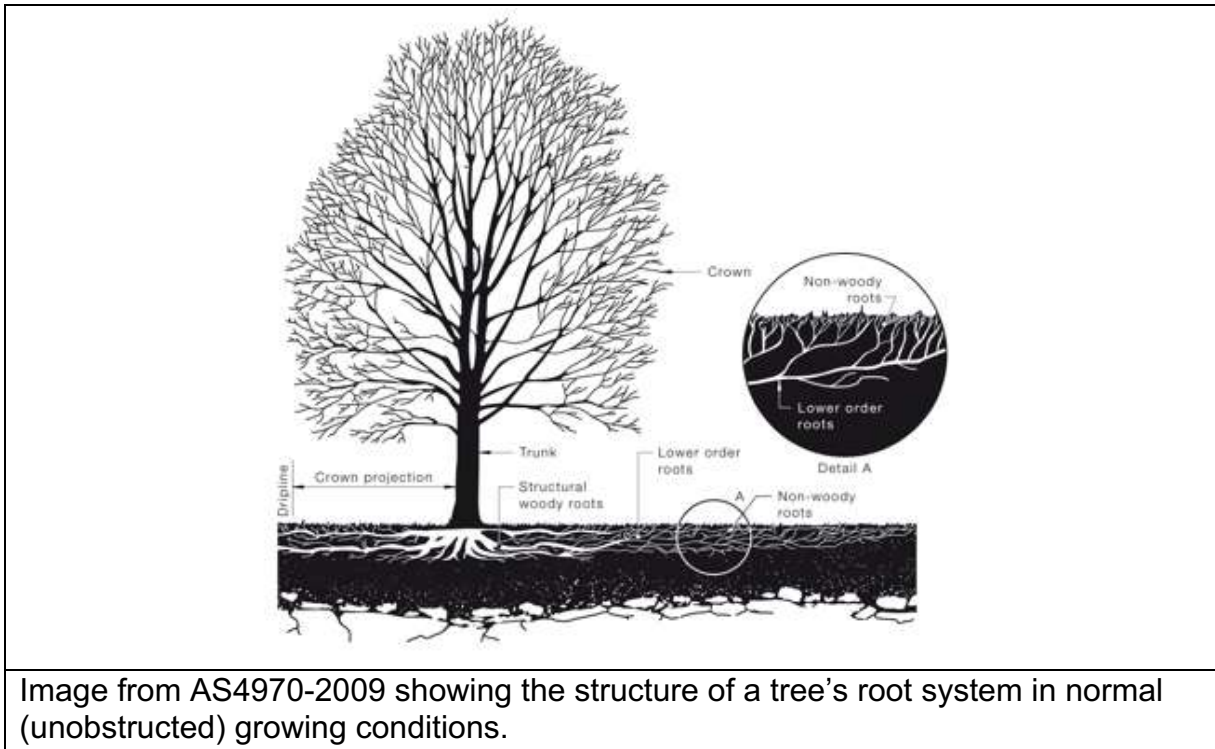


Image from AS4970-2009 showing the structure of a tree's root system in normal (unobstructed) growing conditions.

8.5.2 Fill: Tree roots require air, water, and nutrients to function properly. Increasing the soil level in the TPZ can impact the trees by reducing the availability of water, nutrients and air to the trees underlying root system and can cause the decline of a trees health and vigour. Placing fill directly against the trunk of a tree can potentially cause collar rot. Collar rot forms when soil against the trunk of the tree accelerates sapwood or heartwood decay.⁸

8.6 Tree Sensitive Footings for Fence in the TPZ: To minimise root loss in the TPZ of the trees, the footings of the proposed fence should be flexible during construction as per the following

- All excavations for posts must be carried out manually under the supervision of the Project Arborist.

⁸ Dunster, Julian A., Thomas Smiley, Nelda Matheny, and Sharon Lilly, *Tree Risk Assessment Manual*, Champaign, Illinois: International Society of Arboriculture (2013), page 108.

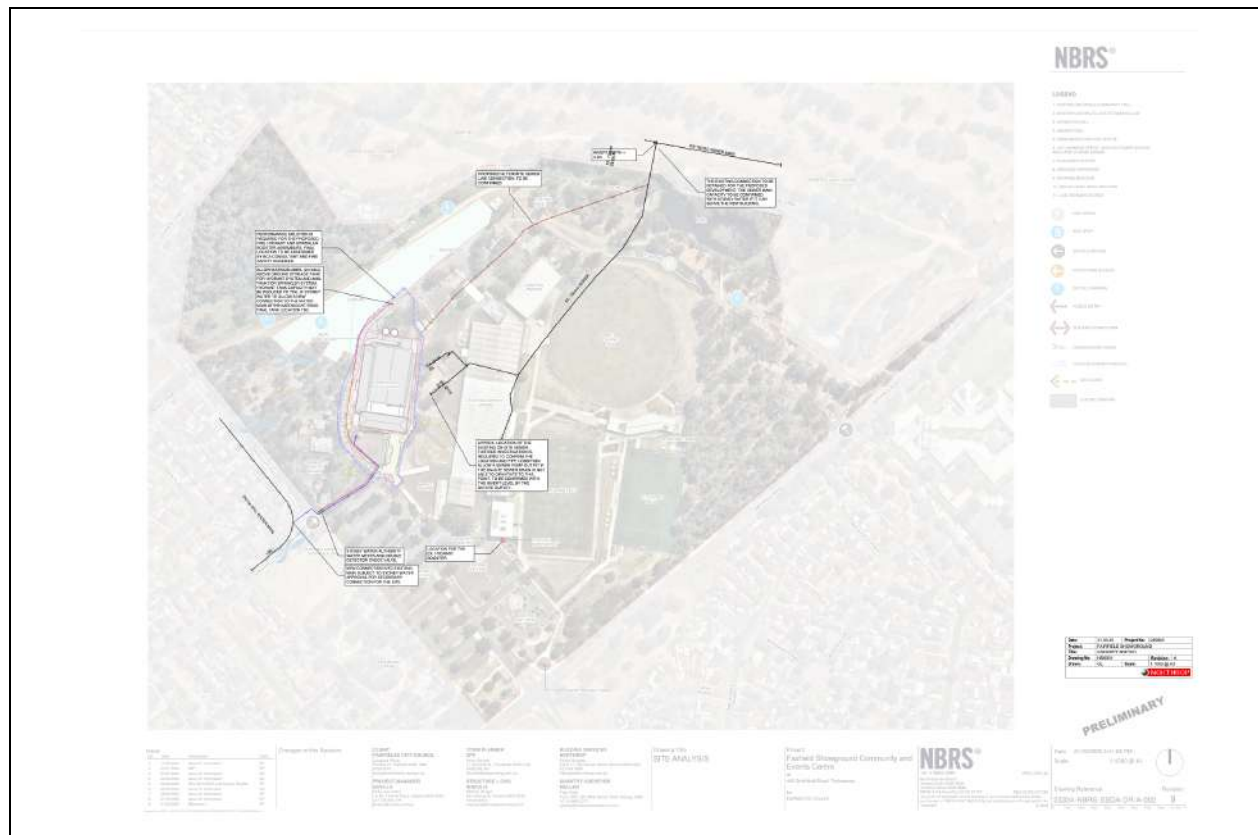
- The location of posts must be flexible to avoid significant roots greater than 40mm in diameter. All roots greater than 40mm in diameter must be retained unless the Project Arborist has assessed and approved in writing that severing the root will not impact the condition or stability of the tree.
- The base of the fence must be located on or above existing soil grades.
- The posts should be located a minimum of 200mm from any root to be retained that is greater than 40mm in diameter.

8.7 Temporary Irrigation to Offset Root Loss Tree 34 and 94: Temporary irrigation will as stimulate new root growth to assist with offsetting the impact of root loss in the TPZ. Temporary irrigation should consist of the following specifications;

- The irrigation should be maintained in adequate functional condition for the duration of the development.
- The irrigation should be installed to distribute water throughout the whole of the TPZ area.
- The irrigation should be set to a timing or soil moisture monitoring system.
- The irrigation should be installed and maintain by qualified arborist/horticulturalist with a minimum AQF level 3.
- The soil moisture in the TPZ should be monitored and adjustments to the rate of watering should be modified as required. The soil moisture should be maintained at no less than 60% of the field capacity of the soil.
- Timing of the irrigation should ensure that the water is not lost to evaporation. Avoid irrigating in the middle of the day when evaporative demand is highest.

8.8 Combined Hydrant Services: A concept sketch for proposed services has been provided that indicates possible location of proposed services that could potentially impact trees (see image below). The drawings include potential proposed works inside and outside the defined development area/scope of works assessed in this report (SSDA area). The impact of the proposed works marked on the drawing below have not been assessed in this report.

To determine if trees will be impacted by these works, the precise location of the proposed services needs to be identified. All trees located within 10 metres of the proposed works will need to be accurately located on the proposed services drawing. Once this information is available, an assessment of all of trees located within 10 metres will need to be carried out in accordance with AS4970-2009 to determine if the trees will be impacted.



Site Address: Fairfield Showground.

Prepared for: Fairfield City Council.

Prepared by: Jack Williams, Urban Arbor Pty Ltd, sales@urbanarbor.com.au, (02) 8004 2802.

Date prepared: 20 August 2025.

9. RECOMMENDATIONS

- 9.1 This report assesses the impact of a proposed development at the subject site to all significant trees located within five metres of development works. One hundred and thirty-eight trees have been identified and assessed.
- 9.2 In appendix 1 two site plans have been prepared, where the tree information including canopy spread, TPZ and SRZ have been overlaid onto the site plans. The following site plans are included;
 - Appendix 1A: Existing site plan (prepared by Urban Arbor)
 - Appendix 1B: Proposed site plan (prepared by NBRs)
- 9.3 Thirteen trees have been recommended to be removed to accommodate the SSDA development works, including tree 17, 18, 19, 23, 25, 26, 27, 28, 77, 78, 79, 83 and 84. See 8.1 for a list of the trees by retention value.
- 9.4 Seven other trees have been identified that will potentially be impacted by the proposed development works and require tree sensitive construction methods to be retained in a viable condition, including tree 34, 90, 91, 97, 102, 104 and 138. See section 7 and 8 for further information.
- 9.5 All other trees can be retained in a viable condition, see section 8.1 for a list of the trees.
- 9.6 Tree 1, 2, 24, 29, 35, 38, 80, 81, 82, 85, 86, 92 and 96 are approved/proposed to be removed as part of the ancillary building/overflow carpark works that form a part of separate REF application.
- 9.7 Fire services are proposed outside the defined development area/scope of works assessed in this report, which have not been assessed in this report and could potentially impact additional trees, see section 8.8.
- 9.8 All trees to be retained must be protected in accordance with AS4970-2009, generic details of which are included in section 10. It is recommended that a site-specific Tree Protection Plan (TPP) is prepared in accordance with AS4970 Protection of trees on development site (2009). The TPP should be developed in conjunction with the overall Construction Management Plan for the site, based on finalised design layout and other factors, such as site access routes and storage locations. As the document relies on input by other consultants/contractors to be effective for protecting trees at the site, it is recommended that the TPP is prepared as part of the Construction Certificate lodgement for the development.
- 9.9 See section 10.10 for general guidance in relation to minimising the impact of proposed landscaping to retained trees and replacement tree planting.
- 9.10 All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques in accordance with AS4970-2009, see section 8.4 for more information.

- 9.11 This report does not provide approval for tree removal or pruning works. All recommendations in this report are subject to approval by the relevant authorities and/or tree owners. This report should be submitted as supporting evidence with the development application.

10. TREE PROTECTION REQUIREMENTS

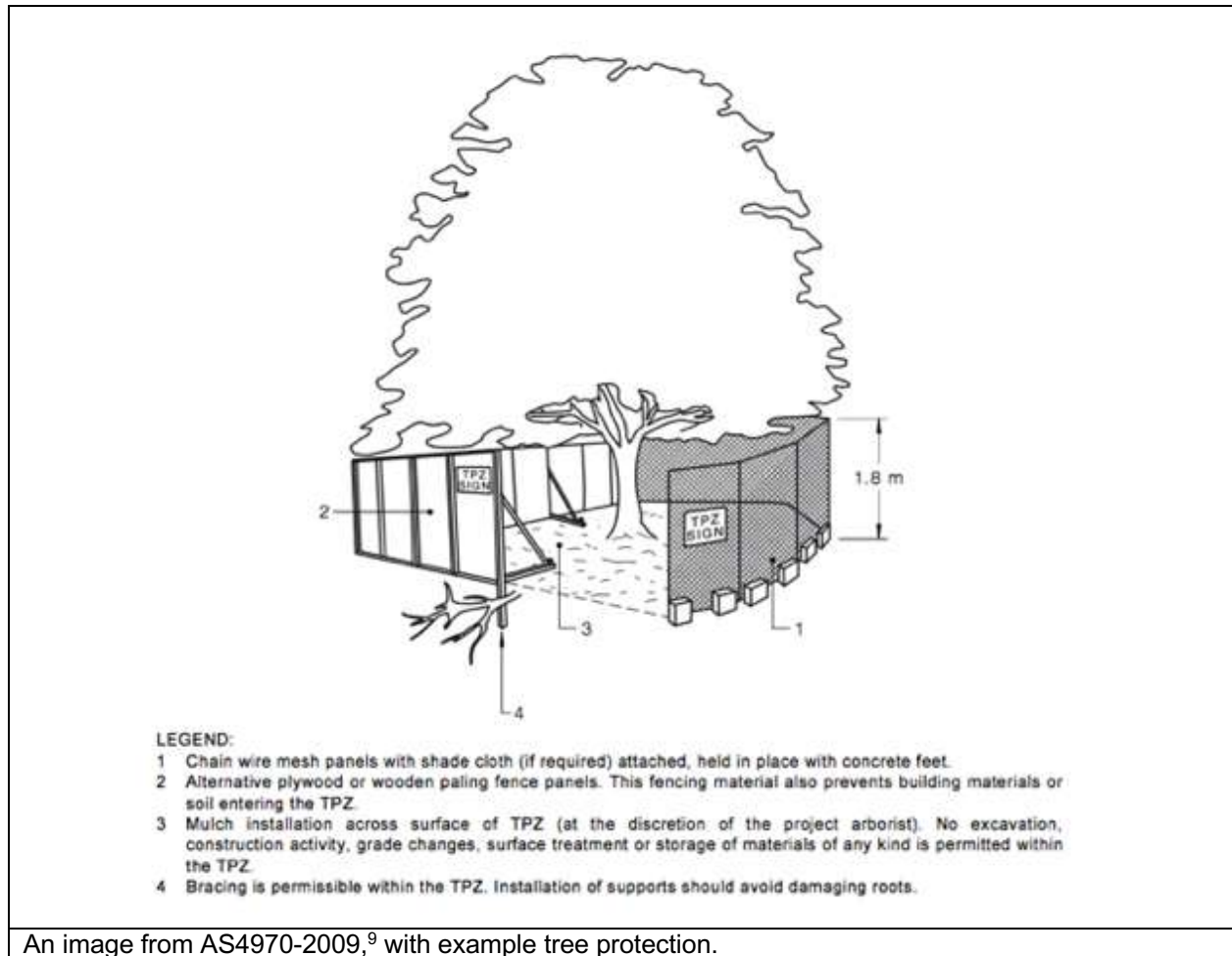
- 10.1 **Use of this report:** All contractors must be made aware of the tree protection requirements prior to commencing works at the site. This report and a copy of the site plans (Appendix 1) drawing must also be made available to any contractor prior to works commencing and during any on site operations.
- 10.2 **Project Arborist:** Prior to any works commencing at the site a project Arborist should be appointed. The project Arborist should be qualified to a minimum AQF level 5 and/or equivalent qualifications and experience and should assist with any development issues relating to trees that may arise. If at any time it is not feasible to carryout works in accordance with this, an alternative must be agreed in writing with the project Arborist.
- 10.3 **Tree work:** All tree work should be carried out by a qualified and experienced Arborist with a minimum of AQF level 3 in arboriculture, in accordance with NSW Work Cover Code of Practice for the Amenity Tree Industry (1998) and AS4373 Pruning of amenity trees (2007).
- 10.4 **Initial site meeting/on-going regular inspections:** The project Arborist is to hold a pre-construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to tree protection that may arise. In accordance with AS4970-2009, the project Arborist should carryout regular site inspections to ensure works are carried out in accordance with this document throughout the development process. Site inspections are recommended on a monthly frequency throughout the development.
- 10.5 **Tree Protection Specifications:**
- 10.5.1 **Trunk and Branch Protection:** The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm x 1800mm or similar) should then be placed around tree trunk. The timber planks should be spaced at 100mm intervals and must be fixed against the trunk with tie wire or strapping and connections finished or covered to protect pedestrians from injury. The hessian and timber planks must not be fixed to the tree in any instance. The trunk and branch protection shall be installed prior to any work commencing on site and shall be maintained in good condition for the entire development period.
- 10.5.2 **Protective fencing:** The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing should only be removed for the landscaping phase and this should be approved by the project Arborist. Where it is not feasible to install fencing at the specified location due to factors such restricting access to areas of the site or for constructing new structures, an alternative location and protection specification must be agreed with the project Arborist. Any modifications to the fencing locations must be approved by the project Arborist.
- 10.5.3 **TPZ signage:** Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:

- Tree protection zone/No access.
- This fence has been installed to prevent damage to the tree/s and their growing environment both above and below ground. Do not move fencing or enter TPZ without the agreement of the project Arborist.
- The name, address, and telephone number of the developer/builder and project Arborist

10.5.4 Mulch: Any areas of the TPZ located inside the subject site must be mulched to a depth of 75mm with good quality mulch. Mulch must not be built-up around the trunk the trees as it can cause collar rot.

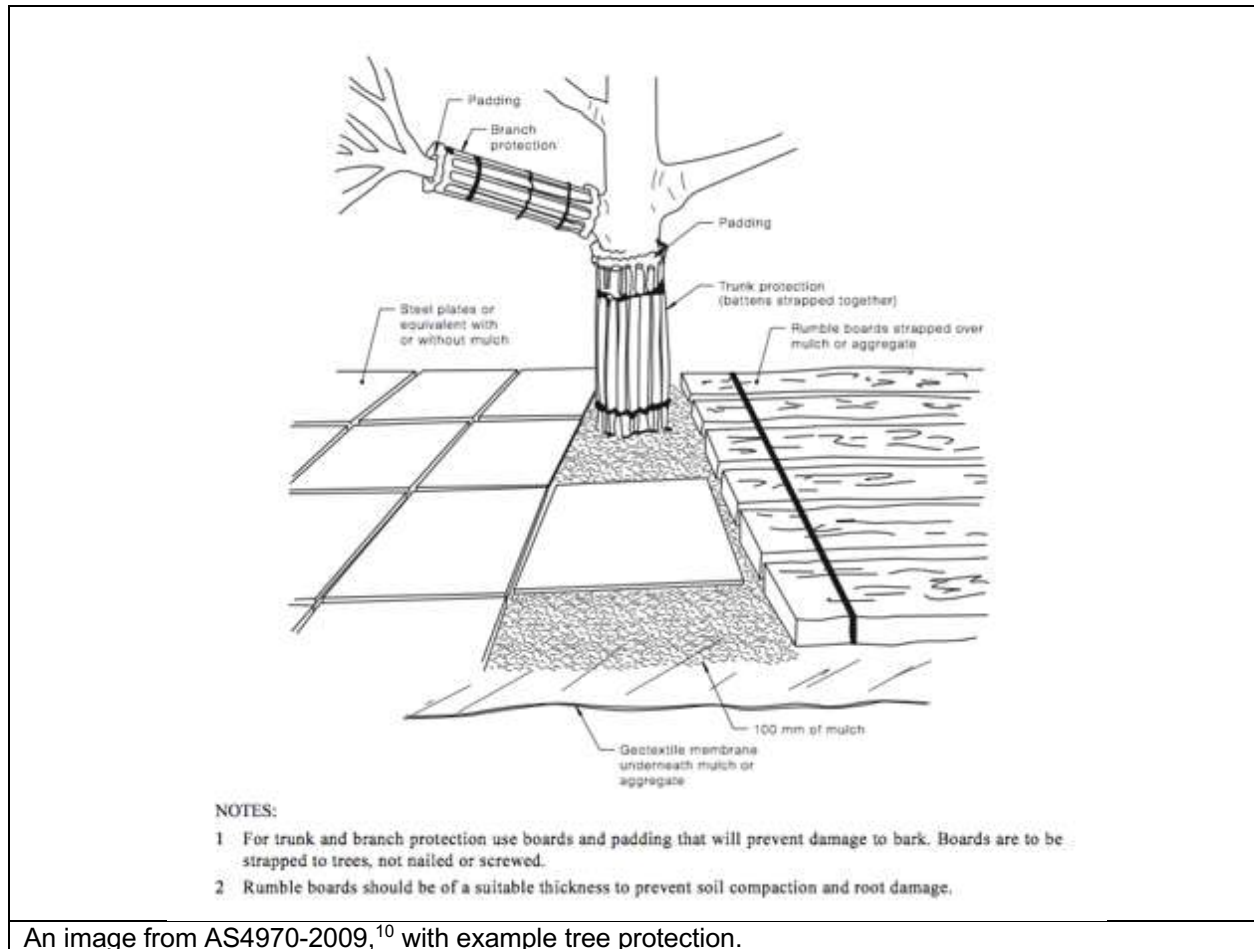
10.5.5 Ground Protection: Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to a depth of between 150-300mm, laid on top of geo textile fabric, with timber/plywood boards overlaid. If vehicles are to be using the area, additional protection will be required such as rumble boards or track mats to spread the weight of the vehicle and avoid load points. Ground protection is to be specified and approved by the project Arborist as required.

10.5.6 Temporary irrigation: Temporary irrigation should distribute water evenly throughout the area of the TPZ. The irrigation should be used for at minimum one hour daily throughout all stages of the development.



An image from AS4970-2009,⁹ with example tree protection.

⁹ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 16.



10.6 Restricted activities inside TPZ: The following activities must be avoided inside the TPZ of all trees to be retained unless approved by the project Arborist. If at any time these activities cannot be avoided an alternative must be agreed in writing with the project Arborist to minimise the impact to the tree.

- A) Machine excavation.
- B) Ripping or cultivation of soil.
- C) Storage of spoil, soil or any such materials
- D) Preparation of chemicals, including preparation of cement products.
- E) Refuelling.
- F) Dumping of waste.
- G) Wash down and cleaning of equipment.
- H) Placement of fill.
- I) Lighting of fires.
- J) Soil level changes.
- K) Any physical damage to the crown, trunk, or root system.
- L) Parking of vehicles.

¹⁰ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 17.

- 10.7 Demolition:** The demolition of all existing structures inside or directly adjacent to the TPZ of trees to be retained must be undertaken in consultation with the project Arborist. Any machinery is to work from inside the footprint of the existing structures or outside the TPZ, reaching in to minimise soil disturbance and compaction. If it is not feasible to locate demolition machinery outside the TPZ of trees to be retained, ground protection will be required. The demolition should be undertaken inwards into the footprint of the existing structures, sometimes referred to as the 'top down, pull back' method.
- 10.8 Excavations:** The project Arborist must supervise and certify that all excavations and root pruning are in accordance with AS4373-2007 and AS4970-2009. For continuous strip footings, first manual excavation is required along the edge of the structures closest to the subject trees. Manual excavation should be a depth of 1 metre (or to unfavourable root growth conditions such as bed rock or heavy clay, if agreed by project Arborist). Next roots must be pruned back in accordance with AS4373-2007. After all root pruning is completed, machine excavation is permitted within the footprint of the structure. For tree sensitive footings, such as pier and beam, all excavations inside the TPZ must be manual. Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. No pruning of roots greater 40mm in diameter is to be carried out without approval of the project arborist. All pruning of roots greater than 40mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3. Root pruning is to be a clean cut with a sharp tool in accordance with AS4373 Pruning of amenity trees (2007).¹¹ The tree root is to be pruned back to a branch root if possible. Make a clean cut and leave as small a wound as possible.
- 10.9 Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimise the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.
- All excavations for landscaping works should be manual and in accordance with section 10.9.
 - Replacement planting for all trees recommended for removal should be incorporated into the landscape plan. It is recommended that at minimum one tree for each tree proposed to be removed are planted to maintain/increase overall canopy cover at the site when mature. Any replacement tree must be selected in accordance with AS2303-2015 Tree stock for landscape use.
 - The location of new plantings inside the TPZ of trees to be retained should be flexible to avoid unnecessary damage to tree roots greater than 40mm in diameter.

¹¹ Council Of Standards Australia, AS 4373 *Pruning of amenity trees* (2007) page 18

- Level changes should be minimised. The existing ground levels within the landscape areas should not be lowered by more than 50mm or increased by more 100mm without assessment by a consulting Arborist.
- New retaining walls should be avoided. Where new retaining walls are proposed inside the TPZ of trees to be retained, they should be constructed from tree sensitive material, such as timber sleepers, that require minimal footings/excavations. If brick retaining walls are proposed inside the TPZ, considerer pier and beam type footings to bridge significant roots that are critical to the trees condition. Retaining walls must be located outside the SRZ and sleepers/beams located above existing soil grades.
- New footpaths and hard surfaces should be minimised, as they can limit the availability of water, nutrients, and air to the trees root system. Where they are proposed, they should be constructed on or above existing soil grades to minimise root disturbance and consider using a permeable surface. Footpaths should be located outside the SRZ.
- Where fill/sub base is used inside the TPZ, fill material should be a coarse granular material that does not restrict the flow of water and air to the root system below. This type of material will also reduce the impact of soil compaction during construction.
- Any new fencing in the TPZ of trees should constructed carefully to avoid impacting significant roots. The location of fence posts should be flexible to allow for the retention of root greater than 40mm in diameter. The base of fence panels should be located above existing soil grades.

- 10.10 **Underground Services:** Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention. No roots greater than 40mm in diameter should be severed during the installation of service pipes unless approved in writing by the project Arborist.
- 10.11 **Sediment and Contamination:** All contamination run off from the development such as but not limited to concrete, sediment and toxic wastes must be prevented from entering the TPZ at all times.
- 10.12 **Tree Wounding/Injury:** Any wounding or injury that occurs to a tree during the construction process will require the project Arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. It is generally accepted that trees may take many years to decline and eventually die from root damage. All repair work is to be carried out by the project Arborist, at the contractor's expense.
- 10.13 **Completion of Development Works:** After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.

11. CONSTRUCTION HOLD POINTS FOR TREE PROTECTION

11.1 Hold Points: Below is a sequence of hold points requiring project Arborist certification throughout the development process. It provides a list of hold points that must be checked and certified. All certification must be provided in written format upon completion of the development. The final certification must include details of any instructions for remediation undertaken during the development. The principal contractor should be responsible for implementing all tree protection requirements.

Hold Point	Stage	Date Completed and Signature of Project Arborist Responsible
Project Arborist to hold pre construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to feasibility of tree protection requirements that may arise. Project Arborist to mark all trees approved for removal under DA consent.	Prior to development work commencing	
Project Arborist to assess and certify that tree protection has been installed in accordance with AS4970-2009 prior to works commencing at site.	Prior to development work commencing.	
In accordance with AS4970-2009 the project arborist should carryout regular site inspections to ensure works are carried out in accordance with the recommendations. Site inspections are recommended on a monthly frequency.	On-going throughout the development	
The removal of existing structures inside the TPZ of any tree to be retained, such as the existing buildings and hard surfaces must be supervised by the project Arborist.	Demolition	
Project Arborist to supervise all manual excavations and root pruning inside the TPZ of any tree to be retained. Project Arborist to approve all pruning of roots greater than 40mm inside TPZ. All root pruning of roots greater than 40mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3.	Construction	
Project Arborist to certify that all underground services including storm water inside TPZ of any tree to be retained have been installed in accordance with AS4970-2009.	Construction	
Project Arborist to approve relocation of tree protection for landscaping. All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with the project Arborist to minimise the impact to trees.	Construction/ Landscape	
After all demolition, construction and landscaping works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.	Upon completion of development	

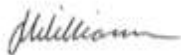
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- Barrell Tree Consultancy, *Tree AZ version 10.10-ANZ*, <http://www.treeaz.com/>.

13. LIST OF APPENDICES

The following are included in the Appendices:

- Appendix 1: Site Plans
- Appendix 2: Tree Inspection Schedule
- Appendix 3: Further Information of Methodology



Jack Williams
Diploma of Arboriculture (AQF5)
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ISA Member No. 228863

Urban Arbor Pty Ltd

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02 8004 2802, sales@urbanarbor.com.au

Site Location: Fairfield Showground

SCALE :
1 : 500

@ A1

DATE :
7/08/2025

URBAN ARBOR
The Trusted Name in Tree Management

Plan Title: Appendix 1A

Prepared by: Jack Williams

Legend

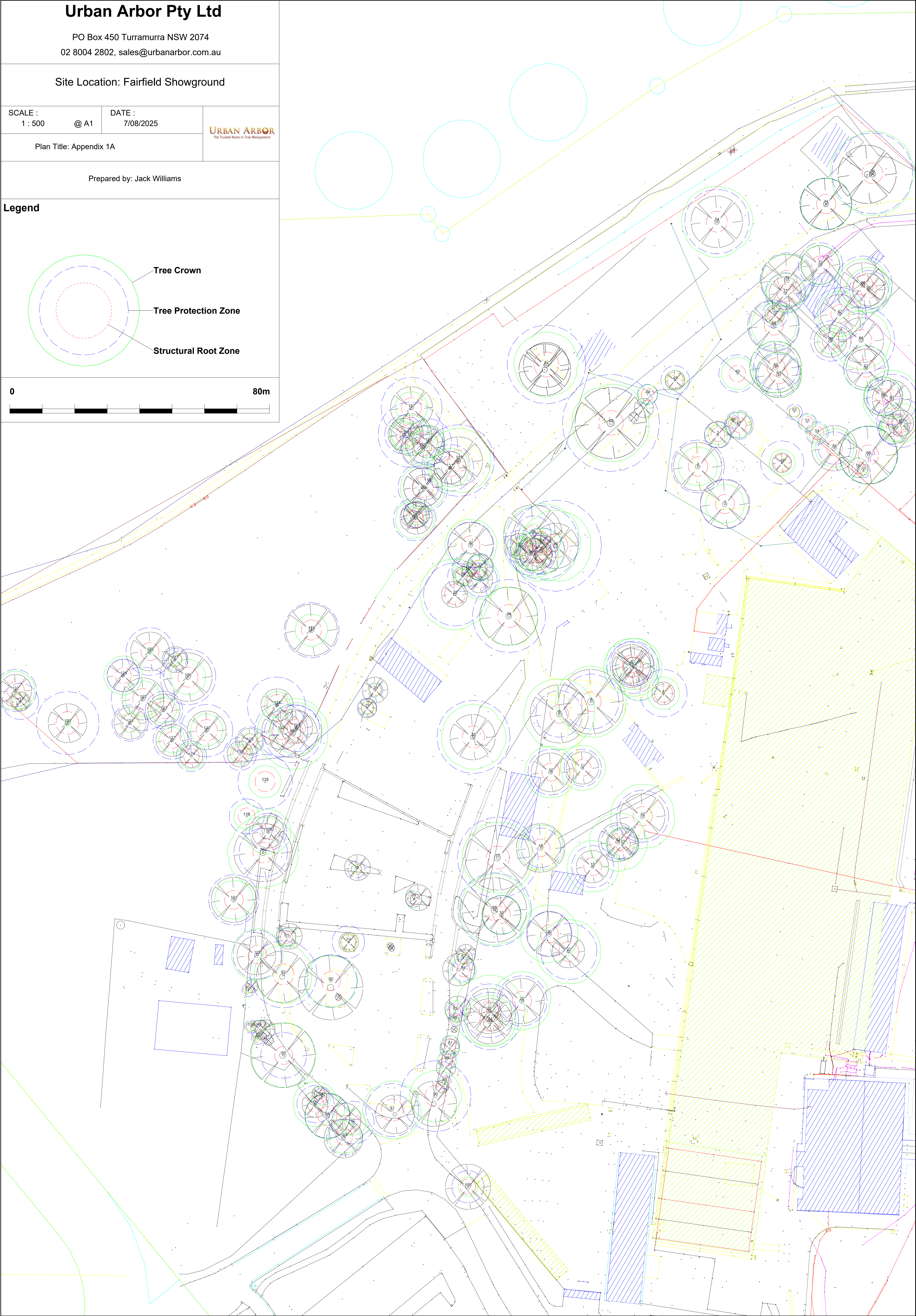
Tree Crown

Tree Protection Zone

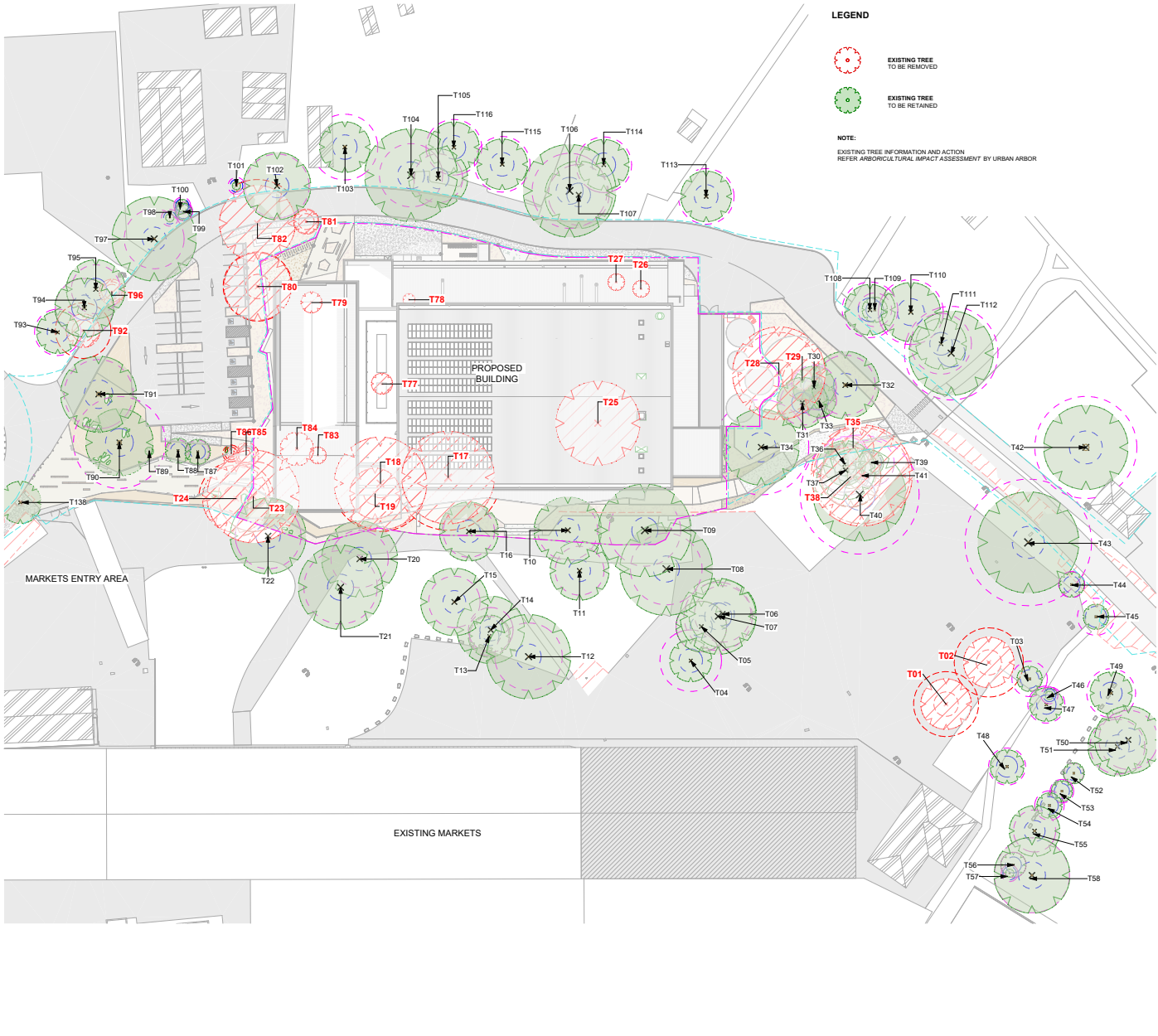
Structural Root Zone

0

80m



Note: Existing trees 59-77 are outside the scope of this project, refer to Arborist report [2500807_FSGSD_AIA]



EXISTING TREE REGISTER

ID	BOTANICAL NAME	COMMON NAME	ACTION	SULE	RETENTION VALUE
T01	Casuarina glauca	Swamp Oak	REMOVE	1.LONG	A1
T02	Casuarina glauca	Swamp Oak	REMOVE	1.LONG	A1
T03	Callistemon salignus	Willow bottlebrush	RETAIN	2.MEDIUM	A2
T04	Eucalyptus tereticornis	Forest Red Gum	RETAIN	2.MEDIUM	A2
T05	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T06	Eucalyptus tereticornis	Forest Red Gum	RETAIN	3.SHORT	A2
T07	Eucalyptus tereticornis	Forest Red Gum	RETAIN	3.SHORT	Z9
T08	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T09	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T10	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T11	Eucalyptus moluccana	Greybox	RETAIN	2.MEDIUM	A2
T12	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T13	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	2.MEDIUM	Z10
T14	Eucalyptus moluccana	Greybox	RETAIN	4.REMOVE	Z4
T15	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T16	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T17	Eucalyptus moluccana	Greybox	REMOVE	3.SHORT	Z9
T18	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	1.LONG	AA
T19	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	2.MEDIUM	A1
T20	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T21	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	2.MEDIUM	A2
T22	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T23	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	2.MEDIUM	Z1
T24	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	1.LONG	AA
T25	Eucalyptus moluccana	Greybox	REMOVE	1.LONG	AA
T26	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	1.LONG	AA
T27	Ulmus parviflora	Chinese Elm	REMOVE	1.LONG	Z1
T28	Ulmus parviflora	Chinese Elm	REMOVE	1.LONG	Z1
T29	Eucalyptus moluccana	Greybox	REMOVE	1.LONG	AA
T30	Eucalyptus tereticornis	Forest Red Gum	REMOVE	4.REMOVE	Z5
T31	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T32	Eucalyptus moluccana	Greybox	RETAIN	3.SHORT	Z10
T33	Eucalyptus moluccana	Greybox	RETAIN	2.MEDIUM	A2
T34	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T35	Eucalyptus moluccana	Greybox	REMOVE	4.REMOVE	Z4
T36	Eucalyptus tereticornis	Forest Red Gum	RETAIN	3.SHORT	Z11
T37	Corymbia maculata	Spotted Gum	RETAIN	2.MEDIUM	AA
T38	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	4.REMOVE	Z4
T39	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	4.REMOVE	Z10
T40	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	AA
T41	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	AA
T42	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T43	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T44	Brachychiton populneus	Kurrajong	RETAIN	1.LONG	Z1
T45	Brachychiton populneus	Kurrajong	RETAIN	2.MEDIUM	A1
T46	Melaleuca quinquenervia	Broadleaf paperbark	RETAIN	2.MEDIUM	Z1
T47	Casuarina glauca	Swamp Oak	RETAIN	1.LONG	A1
T48	Casuarina glauca	Swamp Oak	RETAIN	1.LONG	AA
T49	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T50	Eucalyptus moluccana	Greybox	RETAIN	2.MEDIUM	A2
T51	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T52	Melaleuca inarifolia	Snow in summer	RETAIN	1.LONG	Z1
T53	Jacaranda mimosifolia	Blue jacaranda	RETAIN	1.LONG	Z1
T54	Brachychiton acenifolius	Illawarra flame	RETAIN	2.MEDIUM	A1
T55	Eucalyptus microcorys	Tallowood	RETAIN	1.LONG	Z1
T56	Brachychiton acenifolius	Illawarra flame	RETAIN	2.MEDIUM	Z10
T57	Grevillea robusta	Silky Oak	RETAIN	3.SHORT	Z4
T58	Eucalyptus moluccana	Greybox	RETAIN	3.SHORT	A2
T59	Castanopsis argentea	Blackbean	REMOVE	2.MEDIUM	Z1
T60	Melaleuca stylphelodes	Prickly Leaved Paperbark	REMOVE	1.LONG	Z1
T61	Photinia robusta	Red Leaf Photinia	REMOVE	2.MEDIUM	Z1
T62	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	1.LONG	AA
T63	Corymbia maculata	Spotted Gum	REMOVE	1.LONG	AA
T64	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	2.MEDIUM	A1
T65	Melia azedarach	White Cedar	REMOVE	2.MEDIUM	Z1
T66	Corymbia maculata	Spotted Gum	REMOVE	1.LONG	A1
T67	Corymbia maculata	Spotted Gum	REMOVE	1.LONG	AA
T68	Corymbia maculata	Spotted Gum	RETAIN	1.LONG	A1
T69	Corymbia maculata	Spotted Gum	RETAIN	2.MEDIUM	Z1
T70	Corymbia maculata	Spotted Gum	RETAIN	1.LONG	Z1
T71	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T72	Ficus benjamina	Weeping fig	REMOVE	2.MEDIUM	AA
T73	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	3.SHORT	Z4
T74	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T75	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T76	Eucalyptus fibrosa	Broad leaved red ironbark	REMOVE	2.MEDIUM	Z10
T77	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T78	Corymbia maculata	Spotted Gum	RETAIN	5.SMALL YOUNG	Z1
T79	Corymbia maculata	Spotted Gum	RETAIN	1.LONG	AA
T80	Corymbia maculata	Spotted Gum	RETAIN	2.MEDIUM	Z10
T81	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	5.SMALL YOUNG	Z10
T82	Eucalyptus fibrosa	Broad leaved red ironbark	RETAIN	1.LONG	AA
T83	Corymbia maculata	Spotted Gum	RETAIN	3.SHORT	A2
T84	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T85	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T86	Eucalyptus moluccana	Greybox	RETAIN	3.SHORT	A2
T87	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T88	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T89	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T90	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T91	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T92	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T93	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T94	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T95	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T96	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T97	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T98	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T99	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T100	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T101	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T102	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T103	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T104	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T105	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T106	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T107	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T108	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T109	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T110	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T111	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T112	Eucalyptus moluccana	Greybox	RETAIN	1.LONG	AA
T113	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T114	Eucalyptus tereticornis	Forest Red Gum	RETAIN	2.MEDIUM	A2
T115	Eucalyptus tereticornis	Forest Red Gum	RETAIN	2.MEDIUM	A1
T116	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T117	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T118	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T119	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T120	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T121	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T122	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T123	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T124	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T125	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T126	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T127	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T128	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T129	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T130	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T131	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T132	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T133	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T134	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T135	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T136	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T137	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1
T138	Eucalyptus tereticornis	Forest Red Gum	RETAIN	1.LONG	A1

Issue No.	Date	Description	Chkd
A	30.05.2025	Final Draft SSDA	TS
B	13.06.2025	For SSDA	TS
C	10.07.2025	Issue for State Significance Development Application	TS

Changes to this Revision

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Drawing Title
TREE MANAGEMENT PLAN

Project
Fairfield Showground Community and Events Centre
at
443 Smithfield Road, Prairiewood
for
Fairfield City Council

Date 19/08/2025 11:08:19 AM
Scale 1:500 @ A1

Drawing Reference
23334-NBRS-SSDA-DR-L-1100 C



Revision

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	Swamp Oak	<i>Casuarina glauca</i>	Mature	13	6	640				640	760	Good	Good	Medium	1. Long	A1	7.7	2.9	None.
2	Swamp Oak	<i>Casuarina glauca</i>	Mature	13	6	680				680	790	Good	Fair	Medium	1. Long	A1	8.2	3.0	Co-dominant stems at 2m.
3	Willow Bottlebrush	<i>Callistemon salignus</i>	Mature	6	3	250	240			347	360	Fair	Fair	Medium	2. Medium	A2	4.2	2.2	Reduced foliage density for species.
4	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	16	5	610				610	690	Good	Fair	High	2. Medium	A2	7.3	2.8	Asymmetric crown shape. Significant diameter deadwood. Epicormic growth on trunk.
5	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	18	6	500				500	570	Good	Fair	High	1. Long	A1	6.0	2.6	Asymmetric crown shape.
6	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	20	8	560				560	650	Good	Fair	High	3. Short	A2	6.7	2.8	Asymmetric crown shape. Not marked on survey. 2x upright Co-dominant stems at 8m with stub in between Union.possible regrowth from a failure at this location of trunk and the stems may have weak attachment. Recommend aerial inspection of union of stems if tree is to be retained.
7	Grey Box	<i>Eucalyptus moluccana</i>	Mature	25	9	580	340			672	920	Fair	Fair	High	3. Short	Z9	8.1	3.2	Wound/decay at base of main stem with longicorn damage. Significant crown dieback, approx 20% of crown area dead. Tree requires maintenance pruning and decay testing at base of trunk if it is to be retained.
8	Grey Box	<i>Eucalyptus moluccana</i>	Mature	26	11	710				710	830	Good	Good	High	1. Long	AA	8.5	3.1	Co-dominant stems at 8m, union appears stable with no indicators of weak attachment.
9	Grey Box	<i>Eucalyptus moluccana</i>	Mature	24	11	600				600	710	Good	Good	High	1. Long	AA	7.2	2.9	Co-dominant stems at 9m, union appears stable with no indicators of weak attachment.
10	Grey Box	<i>Eucalyptus moluccana</i>	Mature	18	8	590				590	660	Good	Good	High	1. Long	AA	7.1	2.8	None.
11	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	7	480				480	550	Good	Fair	High	2. Medium	A2	5.8	2.6	Co-dominant stems at 4m with indicators of included bark/weak attachment at union.
12	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	25	10	670				670	780	Good	Good	High	1. Long	AA	8.0	3.0	Co-dominant stems at 7m, union appears stable with no indicators of weak attachment.
13	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Semi-mature	12	5	390				390	440	Fair	Fair	Medium	2. Medium	Z10	4.7	2.3	Trunk lean and asymmetric crown shape due to suppression from adjacent tree.
14	Grey Box	<i>Eucalyptus moluccana</i>	Mature	20	9	440				440	580	Fair	Poor	High	4. Remove	Z4	5.3	2.6	Significant wound/decay at base of trunk. Extensive crown dieback, 30-40% of crown is deadwood. Poor form to remaining live foliage.
15	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	18	8	540				540	650	Good	Fair	High	1. Long	AA	6.5	2.8	Trunk/main stems curve/sweep in shape from 4-10m.
16	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	18	7	510				510	630	Good	Fair	High	1. Long	AA	6.1	2.7	Co-dominant stems at 4m, union appears stable with no indicators of weak attachment.
17	Grey Box	<i>Eucalyptus moluccana</i>	Mature	17	11	1040				1040	1180	Fair	Fair	High	3. Short	Z9	12.5	3.5	Large wound/longicorn damage on trunk from ground to 4m. This appears to have caused the death of adjacent primary branches. May also be compromising the union of additional primary branch. If the tree is to be retained, a detailed condition and risk assessment if required for the management of the tree.
18	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	25	11	590	530	520		948	1090	Good	Fair	High	1. Long	AA	11.4	3.4	Co-dominant stems near base, union appears stable.
19	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	24	6	500				500	620	Good	Fair	High	2. Medium	A1	6.0	2.7	Asymmetric crown shape. Swelling at base of trunk indicates possible decay.
20	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	20	9	570				570	660	Good	Good	High	1. Long	AA	6.8	2.8	Co-dominant stems at 5m, union appears stable with no indicators of weak attachment.

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
21	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	25	10	440	420	390		723	840	Good	Fair	High	2. Medium	A2	8.7	3.1	Co-dominant stems neat base with indicators of included bark at union.
22	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	17	9	530	370			646	760	Good	Good	High	1. Long	AA	7.8	2.9	Co-dominant stems near base, union appears stable with no indicators of weak attachment.
23	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	20	11	690				690	810	Good	Fair	High	3. Short	Z9	8.3	3.0	Trunk failed at 10m. Swelling of growth near base of primary at 4m indicates decay/wound. If tree is to be retained, pruning of affected branch required to alleviate defect.
24	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	18	8	740				740	890	Good	Fair	High	2. Medium	A2	8.9	3.2	Large wound at base of trunk, good response growth.
25	Grey Box	<i>Eucalyptus moluccana</i>	Mature	24	10	940				940	1080	Good	Good	High	1. Long	AA	11.3	3.4	Co-dominant stems at 1m and 8-9m, union appears stable with no indicators of weak attachment. Significant diameter deadwood.
26	Chinese Elm	<i>Ulmus parviflora</i>	Semi-mature	4	2	190				190	220	Good	Good	Low	1. Long	Z1	2.3	1.8	None.
27	Chinese Elm	<i>Ulmus parviflora</i>	Semi-mature	4	2	230				230	260	Good	Good	Low	1. Long	Z1	2.8	1.9	None.
28	Grey Box	<i>Eucalyptus moluccana</i>	Mature	24	11	810				810	930	Good	Good	High	1. Long	AA	9.7	3.2	Significant diameter deadwood. Co-dominant stems at 7m, union appears stable with no indicators of weak attachment.
29	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	9	2.5	390				390	430	Poor	Poor	Medium	4. Remove	Z5	4.7	2.3	Trunk failed at 7m, foliage formed from unstable epicormic growth.
30	Grey Box	<i>Eucalyptus moluccana</i>	Mature	21	5	440				440	510	Good	Good	High	1. Long	AA	5.3	2.5	Co-dominant stems at 8m, union appears stable with no indicators of weak attachment.
31	Grey Box	<i>Eucalyptus moluccana</i>	Mature	15	6	440				440	520	Fair	Fair	High	3. Short	Z10	5.3	2.5	Co-dominant stems at 7m with included bark at union. No central stem. Significant crown dieback, approx 20% dead.
32	Grey Box	<i>Eucalyptus moluccana</i>	Mature	23	8	590				590	690	Good	Fair	High	2. Medium	A2	7.1	2.8	Trunk diameter increases significantly near base indicating possible decay. Significant diameter deadwood. Co-dominant stems at 8m, union appears stable.
33	Grey Box	<i>Eucalyptus moluccana</i>	Mature	16	4	350				350	410	Good	Good	High	1. Long	AA	4.2	2.3	None
34	Grey Box	<i>Eucalyptus moluccana</i>	Mature	19	9	940				940	1180	Good	Fair	High	2. Medium	A2	11.3	3.5	Co-dominant stems at 2m, union appears stable. Trunk diameter increases significantly near base indicating possible decay.
35	Grey Box	<i>Eucalyptus moluccana</i>	Mature	10	3	420				420	490	Poor	Fair	Medium	4. Remove	Z4	5.0	2.5	Apical dieback, health in decline.
36	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	16	5	550				550	640	Fair	Fair	High	3. Short	Z11	6.6	2.7	Multiple previous branch failures. Poor shape/form to remaining branches DBH estimated, no access to trunk.
37	Spotted Gum	<i>Corymbia maculata</i>	Mature	18	7	500				500	580	Good	Fair	High	2. Medium	AA	6.0	2.6	Asymmetric crown shape. DBH estimated, no access to trunk.
38	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	25	7	600				600	680	Good	Poor	High	4. Remove	Z5	7.2	2.8	Cavity in within union of Co-dominant stems at 8m, the union appears structurally compromised. Second cavity opening on trunk at 4m.
39	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Semi-mature	10	3	460				460	520	Fair	Poor	Medium	4. Remove	Z4	5.5	2.5	Apical dieback, health in decline. Multiple previous branch failures.
40	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	22	11	900	750			1172	1300	Fair	Poor	High	4. Remove	Z10	14.1	3.7	Co-dominant stem failed at 5m. Two remaining stems subject to modified/increased loading force and associated probability of failure.

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
41	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	26	12	950				950	1080	Good	Good	High	1. Long	AA	11.4	3.4	Asymmetric crown shape. Co-dominant stems at 5m, union appears stable with no indicators of weak attachment. Significant diameter deadwood.
42	Grey Box	<i>Eucalyptus moluccana</i>	Mature	20	10	610	420	690		1012	1450	Good	Fair	High	1. Long	AA	12.1	3.9	Co-dominant stems at ground.
43	Grey Box	<i>Eucalyptus moluccana</i>	Mature	24	12	1280				1280	1380	Good	Good	High	1. Long	AA	15.0	3.8	Co-dominant stems at 1m, union appears stable with no indicators of weak attachment.
44	Kurrajong	<i>Brachychiton populneus</i>	Semi-mature	6	3	260				260	290	Good	Fair	Medium	1. Long	Z1	3.1	2.0	Co-dominant stems at 1m, union appears stable with no indicators of weak attachment. Not marked on survey.
45	Kurrajong	<i>Brachychiton populneus</i>	Semi-mature	6	3	240	280			369	520	Good	Fair	Medium	2. Medium	A1	4.4	2.5	Co-dominant stems at 1m, union appears stable with no indicators of weak attachment.
46	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Young	4	1	130				130	150	Fair	Fair	Low	2. Medium	Z1	2.0	1.5	Not marked on survey. Suppressed.
47	Swamp Oak	<i>Casuarina glauca</i>	Mature	11	4	370				370	430	Good	Good	Medium	1. Long	A1	4.4	2.3	None.
48	Swamp Oak	<i>Casuarina glauca</i>	Mature	12	4	380	410			559	590	Good	Fair	Medium	1. Long	A1	6.7	2.7	Co-dominant stems at 0.5m with natural bracing.
49	Grey Box	<i>Eucalyptus moluccana</i>	Mature	14	5	250	390	130		481	550	Good	Fair	High	1. Long	AA	5.8	2.6	Co-dominant stems at various heights, the unions appears stable with no indicators of weak attachment.
50	Grey Box	<i>Eucalyptus moluccana</i>	Mature	23	8	580				580	670	Good	Fair	High	2. Medium	A2	7.0	2.8	Co-dominant stems at 4-5m, union appears stable with no indicators of weak attachment. One stem has failed at 8m, the loss of the stem has not significantly modified or impacted the crown shape and form.
51	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	7	540				540	650	Good	Fair	High	1. Long	AA	6.5	2.8	Asymmetric crown shape. Co-dominant stems at 3m, union appears stable with no indicators of weak attachment.
52	Snow In Summer	<i>Melaleuca linarifolia</i>	Semi-mature	2	1.5	200				200	200	Good	Good	Low	1. Long	Z1	2.4	1.7	None.
53	Blue Jacaranda	<i>Jacaranda mimosifolia</i>	Semi-mature	5	2.5	180	150			234	240	Good	Good	Low	1. Long	Z1	2.8	1.8	None.
54	Illawara Flame	<i>Brachychiton acerifolius</i>	Mature	8	3	290				290	338	Good	Fair	Medium	2. Medium	A2	3.5	2.1	Co-dominant stems at 2.5m with included bark at union.
55	Tallowood	<i>Eucalyptus microcorys</i>	Semi-mature	13	6	420				420	490	Good	Good	Medium	1. Long	A1	5.0	2.5	None.
56	Illawara Flame	<i>Brachychiton acerifolius</i>	Semi-mature	5	3	170	150	110		252	260	Good	Fair	Low	2. Medium	Z10	3.0	1.9	Suppressed.
57	Silky Oak	<i>Grevillea robusta</i>	Young	4	1	150				150	170	Fair	Fair	Low	3. Short	Z4	2.0	1.6	Top of crown died back.
58	Grey Box	<i>Eucalyptus moluccana</i>	Mature	20	9	740				740	890	Fair	Fair	High	3. Short	A2	8.9	3.2	Apical dieback, health in early decline. Co-dominant stems at 5-8m, unions appear stable with no indicators of weak attachment.
59	Grey Box	<i>Eucalyptus moluccana</i>	Mature	17	4	400				400	460	Good	Good	High	1. Long	AA	4.8	2.4	Co-dominant stems at 4m, union appears stable with no indicators of weak attachment. Asymmetric crown shape.
60	Grey Box	<i>Eucalyptus moluccana</i>	Mature	20	6	630				630	710	Good	Good	High	1. Long	AA	7.6	2.9	Co-dominant stems at various heights, unions appear stable with no indicators of weak attachment.
61	Grey Box	<i>Eucalyptus moluccana</i>	Mature	21	9	650				650	780	Fair	Fair	High	3. Short	A2	7.8	3.0	Low foliage density for species, health starting to decline. Co-dominant stems at 5-6m, unions appear stable with no indicators of weak attachment.
62	Grey Box	<i>Eucalyptus moluccana</i>	Mature	16	6	430				430	490	Good	Fair	High	2. Medium	AA	5.2	2.5	Asymmetric crown shape. Co-dominant stems at 4m, union appears stable with no indicators of weak attachment.
63	Grey Box	<i>Eucalyptus moluccana</i>	Mature	21	7	570				570	660	Fair	Fair	High	2. Medium	A2	6.8	2.8	Significant diameter deadwood and epicormic growth throughout crown.
64	Grey Box	<i>Eucalyptus moluccana</i>	Mature	23	9	860				860	930	Fair	Fair	High	2. Medium	A2	10.3	3.2	Significant diameter deadwood. Co-dominant stems at 2-4m, unions appear stable with no indicators of weak attachment. One smaller stem near centre died back.

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
65	Grey Box	<i>Eucalyptus moluccana</i>	Mature	17	7	500				500	550	Good	Fair	High	2. Medium	A1	6.0	2.6	Co-dominant stems at 7m, union appears stable with no indicators of weak attachment. No access to trunk at time of inspection.
66	Grey Box	<i>Eucalyptus moluccana</i>	Mature	24	8	750				750	850	Good	Fair	High	1. Long	AA	9.0	3.1	Co-dominant stems at 4-5m, union appears stable with no indicators of weak attachment. No access to trunk at time of inspection.
67	Grey Box	<i>Eucalyptus moluccana</i>	Mature	23	7	500	450			673	700	Good	Good	High	1. Long	AA	8.1	2.8	Co-dominant stems at 1m, union appears stable with no indicators of weak attachment. No access to trunk at time of inspection.
68	Grey Box	<i>Eucalyptus moluccana</i>	Mature	16	4	520				520	580	Good	Fair	High	2. Medium	A2	6.2	2.6	Co-dominant stems at 2.5m, union appears stable with no indicators of weak attachment. One stem failed or died back at 6m.
69	Grey Box	<i>Eucalyptus moluccana</i>	Mature	25	7	640				640	730	Good	Fair	High	2. Medium	A2	7.7	2.9	Co-dominant stems at 3m, union appears stable with no indicators of weak attachment. Decay/ cavity near base of one stem, good response growth.
70	Illawara Flame	<i>Brachychiton acerifolius</i>	Mature	7	2.5	330				330	370	Good	Good	Medium	1. Long	A1	4.0	2.2	None.
71	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	6	520				520	600	Good	Fair	High	2. Medium	A2	6.2	2.7	Co-dominant stems at 5m with possible weak union
72	Grey Box	<i>Eucalyptus moluccana</i>	Mature	24	8	650	260			700	780	Good	Good	High	1. Long	AA	8.4	3.0	Co-dominant stems at 4m, union appears stable with no indicators of weak attachment.
73	Grey Box	<i>Eucalyptus moluccana</i>	Mature	16	6	570				570	650	Good	Good	High	1. Long	AA	6.8	2.8	None.
74	Grey Box	<i>Eucalyptus moluccana</i>	Mature	21	11	830				830	950	Fair	Good	High	2. Medium	A2	10.0	3.2	Co-dominant stems at various heights, unions appear stable with no indicators of weak attachment. Tip dieback on some lateral branches.
75	Spotted Gum	<i>Corymbia maculata</i>	Mature	19	8	660				660	780	Good	Good	High	1. Long	AA	7.9	3.0	None.
76	Grey Box	<i>Eucalyptus moluccana</i>	Mature	20	13	1040				1040	930	Fair	Good	High	2. Medium	A2	12.5	3.2	Reduced foliage density for species. Co-dominant stems at 1m, union appears stable.
77	Blackbean	<i>Castanospermum australe</i>	Semi-mature	5	2.5	160	140			213	270	Good	Fair	Low	2. Medium	Z1	2.6	1.9	Co-dominant stems at 1m with included bark at unio. Not marked on survey.
78	Prickly Leaved Paperbark	<i>Melaleuca styphelioides</i>	Semi-mature	5	1.5	170	140			220	200	Good	Good	Low	1. Long	Z1	2.6	1.7	Not marked on survey.
79	Photinia Robusta	<i>Photinia robusta</i>	Mature	4	2.5	420				420	420	Good	Good	Low	2. Medium	Z1	5.0	2.3	DBH estimated at ground level. Not marked on survey.
80	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	18	8	680				680	750	Good	Good	High	1. Long	AA	8.2	2.9	Co-dominant stems at 3m, union appears stable. Not marked on survey.
81	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	13	3	230				230	260	Good	Good	Medium	1. Long	A1	2.8	1.9	Not marked on survey.
82	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	26	9	630	590			863	980	Good	Fair	Very High	2. Medium	A2	10.4	3.3	Co-dominant stems near base, union appears stable. Significant wound on west stem caused by previous failure/tear out. Significant diameter deadwood. Not marked on survey.
83	White Cedar	<i>Melia azedarach</i>	Semi-mature	3.5	2	230				230	240	Good	Fair	Low	2. Medium	Z1	2.8	1.8	Not marked on survey.
84	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	9	4	290				290	320	Good	Good	Medium	1. Long	A1	3.5	2.1	Not marked on survey.
85	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	10	3	190				190	220	Good	Good	Medium	1. Long	A1	2.3	1.8	Not marked on survey.
86	Spotted Gum	<i>Corymbia maculata</i>	Young	5	1	70				70	90	Fair	Fair	Low	2. Medium	Z1	2.0	1.5	Not marked on survey.
87	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	8	3	230				230	250	Good	Good	Medium	1. Long	A1	2.8	1.8	Not marked on survey.
88	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	9	3	220				220	240	Good	Fair	Medium	2. Medium	A2	2.6	1.8	Co-dominant stems at 1m with adjacent wound. Not marked on survey.
89	Spotted Gum	<i>Corymbia maculata</i>	Young	5	1	90	60			108	120	Good	Good	Low	1. Long	Z1	2.0	1.5	Not marked on survey.

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
90	Spotted Gum	<i>Corymbia maculata</i>	Mature	20	8	910				910	980	Good	Good	High	1. Long	AA	10.9	3.3	Co-dominant stems at 1.5m, union appears stable. Not marked on survey.
91	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	22	9	540	420			684	1080	Good	Good	Very High	1. Long	AA	8.2	3.4	Co-dominant stems near base, Union appears stable. Not marked on survey.
92	Weeping Fig	<i>Ficus benjamina</i>	Mature	8	4	550				550	550	Good	Good	Medium	2. Medium	A1	6.6	2.6	DBH estimated at ground level. Not marked on survey.
93	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	15	5	460				460	510	Fair	Fair	High	3. Short	Z4	5.5	2.5	Selective dieback, approximately 15-20% of crown dead.
94	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	18	7	420	390			573	780	Good	Good	High	1. Long	AA	6.9	3.0	Co-dominant stems near base, union appears stable.
95	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	15	7	480				480	540	Good	Fair	High	1. Long	AA	5.8	2.6	Asymmetric crown shape.
96	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Semi-mature	8	3	200				200	220	Fair	Fair	Medium	2. Medium	Z10	2.4	1.8	Asymmetric crown shape and significant trunk lean. Suppressed by adjacent tree. Not marked on survey.
97	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	22	10	590				590	660	Good	Fair	High	1. Long	AA	7.1	2.8	Asymmetric crown shape. Previous branch failure at 4m.
98	Spotted Gum	<i>Corymbia maculata</i>	Young	6	1	70				70	80	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	Not marked on survey.
99	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	9	2	180				180	200	Good	Good	Medium	1. Long	A1	2.2	1.7	Not marked on survey.
100	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	7	1.5	150				150	170	Good	Fair	Low	2. Medium	Z10	2.0	1.6	Co-dominant stems at 3m with significant bark inclusion at union. Not marked on survey.
101	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Young	5	1	70				70	80	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
102	Broad leaved red Ironbark	<i>Eucalyptus fibrosa</i>	Mature	18	8	630				630	700	Good	Good	High	1. Long	AA	7.6	2.8	None.
103	Spotted Gum	<i>Corymbia maculata</i>	Mature	19	6	650				650	720	Good	Fair	High	3. Short	A2	7.8	2.9	Whole crown/twin stems both previously failed at 10m. Not marked on survey.
104	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	11	550	300			626	910	Good	Good	High	1. Long	AA	7.5	3.2	Not marked on survey.
105	Grey Box	<i>Eucalyptus moluccana</i>	Mature	15	7	480				480	530	Good	Good	High	1. Long	AA	5.8	2.5	Not marked on survey.
106	Spotted Gum	<i>Corymbia maculata</i>	Mature	26	11	550	500			743	950	Good	Fair	Very High	3. Short	A2	8.9	3.2	Cavity on trunk at 6m, appears to have significant decay, internal decay test of defect required to determine if tree is structurally adequate for retention.
107	Spotted Gum	<i>Corymbia maculata</i>	Mature	26	8	600				600	680	Good	Good	Very High	1. Long	AA	7.2	2.8	None.
108	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	15	6	550				550	650	Good	Fair	High	2. Medium	A2	6.6	2.8	Wound at base of trunk.
109	Grey Box	<i>Eucalyptus moluccana</i>	Semi-mature	9	3	330				330	350	Fair	Fair	Medium	2. Medium	Z10	4.0	2.1	Suppressed by adjacent tree. Not marked on survey.
110	Grey Box	<i>Eucalyptus moluccana</i>	Mature	16	7	550	200	260		640	900	Good	Good	High	1. Long	AA	7.7	3.2	Not marked on survey.
111	Grey Box	<i>Eucalyptus moluccana</i>	Mature	12	6	600				600	620	Good	Good	High	1. Long	A1	7.2	2.7	Not marked on survey.

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Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1	Stem 2	Stem 3	Stem 4	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
112	Grey Box	<i>Eucalyptus moluccana</i>	Mature	25	10	700	600			922	1000	Good	Good	Very High	1. Long	AA	11.1	3.3	None.
113	Grey Box	<i>Eucalyptus moluccana</i>	Mature	20	5	710				710	830	Good	Good	High	1. Long	A1	8.5	3.1	None.
114	Spotted Gum	<i>Corymbia maculata</i>	Mature	24	4	750				750	890	Good	Fair	High	2. Medium	A2	9.0	3.2	Cavity near base of trunk.
115	Grey Box	<i>Eucalyptus moluccana</i>	Mature	18	5	700				700	850	Good	Fair	High	2. Medium	A1	8.4	3.1	DBH estimated. Wounds at base of trunk.
116	Spotted Gum	<i>Corymbia maculata</i>	Mature	18	4	450				450	550	Good	Good	High	1. Long	A1	5.4	2.6	None.
117	Dead Tree	<i>Dead Tree</i>	Dead	11	1	680				680	750	Dead	Poor	Low	4. Remove	Z4	8.2	2.9	Dead habitat pruned tree.
118	Grey Box	<i>Eucalyptus moluccana</i>	Semi-mature	9	2.5	370				370	440	Good	Good	Medium	1. Long	A1	4.4	2.3	None.
119	Tallowood	<i>Eucalyptus microcorys</i>	Semi-mature	8	3	260	270	200		425	370	Good	Fair	Medium	1. Long	A1	5.1	2.2	Co-dominant stems at 1m.
120	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	5	470	480			672	960	Good	Good	High	1. Long	AA	8.1	3.3	None.
121	Spotted Gum	<i>Corymbia maculata</i>	Mature	26	4	390				390	460	Fair	Good	High	2. Medium	A2	4.7	2.4	Reduced foliage density for species.
122	Grey Box	<i>Eucalyptus moluccana</i>	Mature	23	4	490				490	560	Good	Good	High	1. Long	A1	5.9	2.6	None.
123	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	4	480				480	610	Good	Good	High	1. Long	A1	5.8	2.7	None.
124	Grey Box	<i>Eucalyptus moluccana</i>	Semi-mature	16	3	470				470	550	Good	Good	High	1. Long	A1	5.6	2.6	None.
125	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	5.5	590	570			820	920	Good	Good	High	1. Long	AA	9.8	3.2	None.
126	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	5.5	720				720	850	Fair	Fair	High	2. Medium	A1	8.6	3.1	Wound at base of trunk with fair response growth, appears to be caused by Longicorn.
127	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	7	2	290				290	340	Fair	Fair	Medium	2. Medium	Z10	3.5	2.1	Asymmetric crown shape and suppressed form.
128	Dead Tree	<i>Dead Tree</i>	Dead	7	1	620				620	650	Dead	Poor	Low	4. Remove	Z4	7.4	2.8	Dead habitat pruned tree.
129	Spotted Gum	<i>Corymbia maculata</i>	Mature	22	6	420				420	490	Good	Good	High	1. Long	A1	5.0	2.5	None.
130	Dead Tree	<i>Dead Tree</i>	Dead	9	1	560	580			806	1140	Dead	Poor	Low	4. Remove	Z4	9.7	3.5	None.
131	Grey Box	<i>Eucalyptus moluccana</i>	Mature	22	2.5	470				470	550	Good	Fair	High	2. Medium	A1	5.6	2.6	Slender form.
132	Grey Box	<i>Eucalyptus moluccana</i>	Mature	19	6	540				540	620	Good	Fair	High	2. Medium	A1	6.5	2.7	Asymmetric crown shape.
133	Spotted Gum	<i>Corymbia maculata</i>	Mature	17	5	570				570	660	Fair	Fair	High	2. Medium	A2	6.8	2.8	Asymmetric crown shape. Multiple previous branch failures and selective crown dieback of approximately 10-15
134	Forest Red Gum	<i>Eucalyptus tereticornis</i>	Mature	24	5	590				590	670	Fair	Fair	High	3. Short	A4	7.1	2.8	Significant cavity and decay in Co-dominant stem union at 8m. Possible habitat hollow, ecologist advice required.
135	Grey Box	<i>Eucalyptus moluccana</i>	Mature	25	6	840				840	980	Good	Good	High	1. Long	AA	10.1	3.3	None.
136	Grey Box	<i>Eucalyptus moluccana</i>	Semi-mature	8	4	500				500	580	Fair	Fair	Medium	2. Medium	Z10	6.0	2.6	Asymmetric crown shape and suppressed form.
137	Grey Box	<i>Eucalyptus moluccana</i>	Mature	17	5	780				780	860	Fair	Fair	High	2. Medium	A2	9.4	3.1	Minor crown tip dieback and asymmetric crown shape.
138	Narrow-leaved Ironbark	<i>Eucalyptus crebra</i>	Mature	14	3.5	420				420	480	Good	Good	High	1. Long	A1	5.0	2.4	None.

Explanatory Notes

Tree Species - Where species is unknown it is indicated with an 'spp'.

Age Class - Over mature (OM), Mature (M), Early mature (EM), Semi mature (SM), Young (Y).

Diameter at Breast Height (DBH) - Measured with a DBH tape or estimated at approximately 1.4m above ground level.

Diameter Above root Buttresses (DAB): Measured with a DBH tape or estimated above root buttresses (DAB) for calculating the SRZ.

Height - Height from ground level to top of crown. All heights are estimated unless otherwise indicated.

Spread - Radius of crown at widest section. All tree spreads are estimated unless otherwise indicated.

Tree Protection Zone (TPZ) - DBH x 12. Measured in radius from the centre of the trunk. Rounded to nearest 0.1m. For monocots, the TPZ is set at 1 metre outside the crown projection.

Structural Root Zone (SRZ) - (DAB x 50)^{0.42} x 0.64. Measured in radius from the centre of the trunk. Rounded up to nearest 0.1m.

Health - Good/Fair/Poor/Dead

Structure - Good/Fair/Poor

Safe Useful Life Expectancy (SULE) - 1. Long (40+years), 2. Medium (15 - 40 years), 3. Short (5 - 15 years), 4. Remove (under 5 years), 5. Small/young.

Amenity Value - Very High/High/Medium/Low/Very Low.

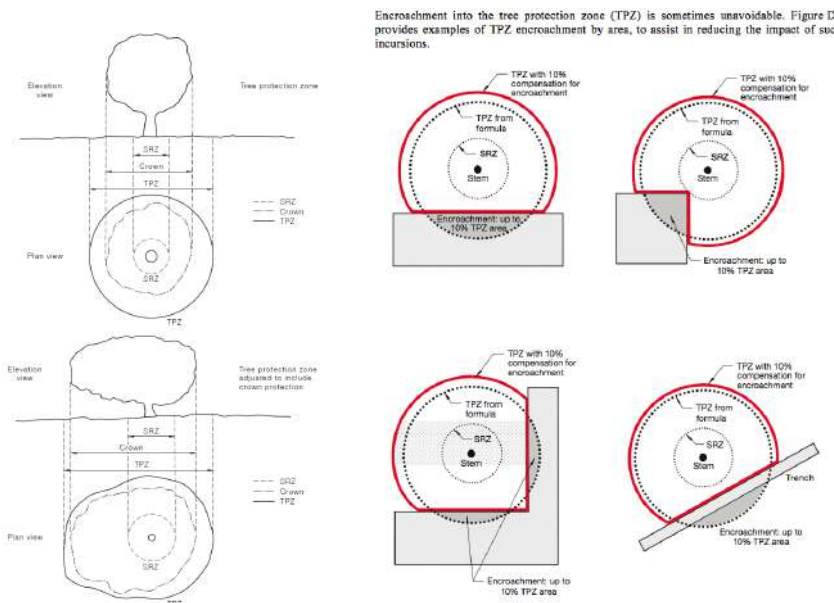
Retention Value: Tree A2, see appendix 3 for categories.

Appendix 3 - Further Information of Methodology

1. **Tree Protection Zone:** The tree protection zone (TPZ) is the principle means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. The radius of the TPZ is calculated for each tree by multiplying its DBH x 12. The derived value is measured in radius from the centre of the stem/trunk at ground level. A TPZ should not be less than 2.0 metres nor greater than 15 metres (except where crown protection is required). It is commonly observed that tree roots will extend significant further than the indicative TPZ, however the TPZ is an area identified AS4970-2009 to be extent where root loss or disturbance will generally not impact the viability of the tree. The TPZ is identified as a restricted area to prevent damage to trees either above or below ground during a development. Where trees are intended to be retained proposed developments must provide an adequate TPZ around trees. The TPZ is set aside for the tree's root zone, trunk and crown and it is essential for the stability and longevity of the tree. The tree protection also incorporates the SRZ (see below for more information about the SRZ). I have calculated the TPZ of palms, other monocots, cycads and tree ferns at one metre outside the crown projection. See appendices for additional information about the TPZ including information about calculating the TPZ and examples of TPZ encroachment.

Minor encroachment into TPZ: Sometimes encroachment into the TPZ is unavoidable. Encroachment includes but is not limited to activities such as excavation, compacted fill and machine trenching. Minor encroachment of up to 10% of the overall TPZ area is normally considered acceptable, providing there is space adjacent to the TPZ for the tree to compensate and the tree is displaying adequate vigour/health to tolerate changes to its growing environment.

Major encroachment into TPZ: Where encroachment of more than 10% of the overall TPZ area is proposed the project Arborist must investigate and demonstrate that the tree will remain in a viable condition. In some cases, tree sensitive construction methods such as pier and beam footings, suspended slabs, or cantilevered sections, can be utilised to allow additional encroachment into the TPZ by bridging over roots and minimising root disturbance. Major encroachment is only possible if it can be undertaken without severing significant size roots, or if it can be demonstrated that significant roots will not be impacted.



2. **Structural Root Zone:** This is the area around the base of a tree required for the trees stability in the ground. An area larger than the SRZ always need to be maintained to preserve a viable tree as it will only have a minor effect on the trees vigour and health. There are several factors that determine the SRZ which include height, crown area, soil type and soil moisture. It can also be influenced by other factors such as natural or built structures. Generally work within the SRZ should be avoided.

An indicative SRZ radius can be determined from the diameter of the trunk measured immediately above the root buttresses. Root investigation could provide more information about the extent of the SRZ. The following formula should be used to calculate the SRZ.

SRZ radius = $(D \times 50)^{0.42} \times 0.64$ (D = Diameter above root buttress).

3. **Tree Age Class:** It can be difficult to determine the age of a tree without carrying out invasive tests that may damage the tree, so we have categorised there likely age class which is defined below;
 - Young/Newly planted: Young or recently planted tree.
 - Semi Mature: Up to 20% of the usual life expectancy for the species.
 - Early mature/Mature: Between 20%-80% of the usual life expectancy for the species.
 - Over mature: Over 80% of the usual life expectancy for the species.
 - Dead: Tree is dead or almost dead.

4. **Health/Physiological Condition:** Below are examples conditions used when assigning a category for tree health.

Category	Example condition	Summary
Good	• Crown has good foliage density for species. • Tree shows no or minimal signs of pathogens that are unlikely to have an effect on the health of the tree. • Tree is displaying good vigour and reactive growth development.	• The tree is in above average health and condition and no remedial works are required.
Fair	• The tree may be starting to dieback or have over 25% deadwood. • Tree may have slightly reduced crown density or thinning. • There may be some discolouration of foliage. • Average reactive growth development. • There may be early signs of pathogens which may further deteriorate the health of the tree. • There may be epicormic growth indicating increased levels of stress within the tree.	• The tree is in below average health and condition and may require remedial works to improve the trees health.
Poor	• The tree may be in decline, have extensive dieback or have over 30% deadwood. • The canopy may be sparse or the leaves may be unusually small for species. • Pathogens or pests are having a significant detrimental effect on the tree health.	• The tree is displaying low levels of health and removal or remedial works may be required.
Dead	• The tree is dead or almost dead.	• The tree should generally be removed.

5. **Structural Condition:** Below are examples conditions used when assigning a category for structural condition.

Category	Example condition	Summary
Good	• Branch unions appear to be strong with no sign of defects. • There are no significant cavities. • The tree is unlikely to fail in usual conditions. • The tree has a balanced crown shape and form.	• The tree is considered structurally good with well developed form.
Fair	• The tree may have minor structural defects within the structure of the crown that could potentially develop into more significant defects. • The tree may have a cavity that is currently unlikely to fail but may deteriorate in the future. • The tree is an unbalanced shape or leans significantly. • The tree may have minor damage to its roots. • The root plate may have moved in the past but the tree has now compensated for this. • Branches may be rubbing or crossing.	• The identified defects are unlikely cause major failure. • Some branch failure may occur in usual conditions. • Remedial works can be undertaken to alleviate potential defects.
Poor	• The tree has significant structural defects. • Branch unions may be poor or weak. • The tree may have a cavity or cavities with excessive levels of decay that could cause catastrophic failure. • The tree may have root damage or is displaying signs of recent movement. • The tree crown may have poor weight distribution which could cause failure.	• The identified defects are likely to cause either partial or whole failure of the tree.

6. **Amenity Value:** To determine the amenity value of a tree we assess a number of different factors, which include but are not limited to the information below.

- The visibility of the tree to adjacent sites.
- The relationship between the tree and the site.
- Whether the tree is protected by any statutory conditions.
- The habitat value of the tree.
- Whether the tree is considered a noxious weed species.

The amenity value is rated using one of the following values.

- Very High
- High
- Moderate
- Low
- Very Low

7. **Safe Useful Life Expectancy (SULE), (Barrel, 2001):** A trees safe useful life expectancy is determined by assessing a number of different factors including the health and vitality, estimated age in relation to expected life expectancy for the species, structural defects, and remedial works that could allow retention in the existing situation.

Category	Description
1. Long - Over 40 years	(a) Structurally sound trees located in positions that can accommodate future growth. (b) Trees that could be made suitable for retention in the long term by remedial tree care. (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.
2. Medium - 15 to 40 years	(a) Trees that may only live between 15 and 40 more years. (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons. (c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. (d) Trees that could be made suitable for retention in the medium term by remedial tree care.
3. Short - 5 to 15 years	(a) Trees that may only live between 5 and 15 more years. (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons. (c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.
4. Remove - Under 5 years	(a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions. (b) Dangerous trees because of instability or recent loss of adjacent trees. (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form. (d) Damaged trees that are clearly not safe to retain. (e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. (f) Trees that are damaging or may cause damage to existing structures within 5 years. (g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f). (h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.
5. Small/Young	(a) Small trees less than 5m in height. (b) Young trees less than 15 years old but over 5m in height. (c) Formal hedges and trees intended for regular pruning to artificially control growth.

8. **Root investigations:** The root investigations should identify roots greater than 30mm in diameter that are located along the edge of the structures footprint or in the location of footings. Root investigations must be carried out using non-invasive methods (manual excavations). Any excavations for the root investigations must be carried out manually to avoid damaging the roots during excavations. Manual excavation may include the use of a high-pressure air/air knife, or a combination of high-pressure water and a vacuum device. When hand excavating carefully work around roots retaining as many as possible. Take care to not fray, wound, or cause damage to any roots during excavations as this may cause decay or infection from pathogens. It is essential that exposed roots are kept moist and the excavation back filled as soon as possible. The root investigations should be carried out by a qualified Arborist minimum AQF3. Once roots are exposed, a visual assessment can be carried out by a consulting Arborist to evaluate the potential impact of the proposed root loss on the health and stability of the tree. A root map/report should be prepared identifying the findings of investigations, including photographs as supporting evidence in the report.

9. **Retention Value:** The system I have used to award the retention value is Tree AZ. Tree AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The table below provides a brief description of each category.

TreeAZ Categories (Version 10.04-ANZ)

CAUTION: TreeAZ assessments must be carried out by a competent person qualified and experienced in arboriculture. The following category descriptions are designed to be a brief field reference and are not intended to be self-explanatory. They must be read in conjunction with the most current explanations published at www.TreeAZ.com.

Category Z: Unimportant trees not worthy of being a material constraint

Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species

- Z1** Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
- Z2** Too close to a building, i.e. exempt from legal protection because of proximity, etc
- Z3** Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc

High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure

- Z4** Dead, dying, diseased or declining
- Z5** Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
- Z6** Instability, i.e. poor anchorage, increased exposure, etc
- Excessive nuisance:** Trees that are likely to be removed within 10 years because of unacceptable impact on people
- Z7** Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
- Z8** Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc

Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population

- Z9** Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
- Z10** Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
- Z11** Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
- Z12** Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

NOTE: Z trees with a high risk of death/failure (Z4, Z5 & Z6) or causing severe inconvenience (Z7 & Z8) at the time of assessment and need an urgent risk assessment can be designated as ZZ. ZZ trees are likely to be unsuitable for retention and at the bottom of the categorization hierarchy. In contrast, although Z trees are not worthy of influencing new designs, urgent removal is not essential and they could be retained in the short term, if appropriate.

Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

- A1** No significant defects and could be retained with minimal remedial care
- A2** Minor defects that could be addressed by remedial care and/or work to adjacent trees
- A3** Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
- A4** Trees that may be worthy of legal protection for ecological reasons (Advisory requiring specialist assessment)

NOTE: Category A1 trees that are already large and exceptional, or have the potential to become so with minimal maintenance, can be designated as AA at the discretion of the assessor. Although all A and AA trees are sufficiently important to be material constraints, AA trees are at the top of the categorization hierarchy and should be given the most weight in any selection process.

TreeAZ is designed by Barrell Tree Consultancy (www.barrelltreecare.co.uk) and is reproduced with their permission

Glossary of Terms

Abiotic - Pertaining to non-living agents; e.g. environmental factors

Adventitious shoots - Shoots that develop other than from apical, axillary or dormant buds; see also 'epicormic'

Anchorage - The system whereby a tree is fixed within the soil, involving cohesion between roots and soil and the development of a branched system of roots which withstands wind and gravitational forces transmitted from the aerial parts of the tree

Bark - A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex and periderm; occasionally applied only to the periderm or the phellem

Branch:

- **Primary**. A first order branch arising from a stem
- **Lateral**. A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches
- **Sub-lateral**. A third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs

Branch collar - A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base

Brown-rot - A type of wood decay in which cellulose is degraded, while lignin is only modified

Buckling - An irreversible deformation of a structure subjected to a bending load

Buttress zone - The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions

Cambium - Layer of dividing cells producing xylem (woody) tissue internally and phloem (bark) tissue externally

Canker - A persistent lesion formed by the death of bark and cambium due to colonisation by fungi or bacteria

Compartmentalisation - The confinement of disease, decay or other dysfunction within an anatomically discrete region of plant tissue, due to passive and/or active defences operating at the boundaries of the affected region

Compressive loading - Mechanical loading which exerts a positive pressure; the opposite to tensile loading

Condition - An indication of the physiological condition of the tree. Where the term 'condition' is used in a report, it should not be taken as an indication of the stability of the tree

Crown/Canopy - The main foliage bearing section of the tree

Crown lifting - The removal of limbs and small branches to a specified height above ground level

Crown thinning - The removal of a proportion of secondary branch growth throughout the crown to produce an even density of foliage around a well-balanced branch structure

Crown reduction/shaping - A specified reduction in crown size whilst preserving, as far as possible, the natural tree shape

DAB (Diameter Above Buttress) - Trunk diameter measured above the root buttress

Defect - In relation to tree hazards, any feature of a tree which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment

Dieback - The death of parts of a woody plant, starting at shoot-tips or root-tips

Disease - A malfunction in or destruction of tissues within a living organism, usually excluding mechanical damage; in trees, usually caused by pathogenic micro-organisms

Dominance - In trees, the tendency for a leading shoot to grow faster or more vigorously than the lateral shoots; also the tendency of a tree to maintain a taller crown than its neighbours

Dormant bud - An axial bud which does not develop into a shoot until after the formation of two or more annual wood increments; many such buds persist through the life of a tree and develop only if stimulated to do so

Dysfunction - In woody tissues, the loss of physiological function, especially water conduction, in sapwood

DBH (Diameter at Breast Height) - Stem diameter measured at a height of 1.4 metres or the nearest measurable point. Where measurement at a height of 1.4 metres is not possible, another height may be specified

Deadwood - Branch or stem wood bearing no live tissues. Retention of deadwood provides valuable habitat for a wide range of species and seldom represents a threat to the health of the tree. Removal of deadwood can result in the ingress of decay to otherwise sound tissues and climbing operations to access deadwood can cause significant damage to a tree. Removal of deadwood is generally recommended only where it represents an unacceptable level of hazard

Epicormic shoot - A shoot having developed from a dormant or adventitious bud and not having developed from a first year shoot

Flush-cut - A pruning cut which removes part of the branch bark ridge and or branch-collar

Girdling root - A root which circles and constricts the stem or roots possibly causing death of phloem and/or cambial tissue

Habit - The overall growth characteristics, shape of the tree and branch structure

Hazard beam - An upwardly curved part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting

Heartwood/false-heartwood - The dead central wood that has become dysfunctional as part of the aging processes and being distinct from the sapwood

Heave - A term mainly applicable to a shrinkable clay soil which expands due to re-wetting after the felling of a tree which was previously extracting moisture from the deeper layers; also the lifting of pavements and other structures by root diameter expansion; also the lifting of one side of a wind-rocked root-plate

Included bark (ingrown bark) - Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact

Lever arm - A mechanical term denoting the length of the lever represented by a structure that is free to move at one end, such as a tree or an individual branch

Lignin - The hard, cement-like constituent of wood cells; deposition of lignin within the matrix of cellulose microfibrils in the cell wall is termed Lignification

Lions tailing - A term applied to a branch of a tree that has few if any side-branches except at its end, and is thus liable to snap due to end-loading

Loading - A mechanical term describing the force acting on a structure from a particular source; e.g. the weight of the structure itself or wind pressure

Mycelium - The body of a fungus, consisting of branched filaments (hyphae)

Occlusion - The process whereby a wound is progressively closed by the formation of new wood and bark around it

Pathogen - A micro-organism which causes disease in another organism

Photosynthesis - The process whereby plants use light energy to split hydrogen from water molecules, and combine it with carbon dioxide to form the molecular building blocks for synthesizing carbohydrates and other biochemical products

Probability - A statistical measure of the likelihood that a particular event might occur

Pruning - The removal or cutting back of twigs or branches, sometimes applied to twigs or small branches only, but often used to describe most activities involving the cutting of trees or shrubs

Radial - In the plane or direction of the radius of a circular object such as a tree stem

Reactive Growth/Reaction Wood - Production of woody tissue in response to altered mechanical loading; often in response to internal defect or decay and associated strength loss (cf. adaptive growth)

Ring-barking - The removal of a ring of bark and phloem around the circumference of a stem or branch, normally resulting in an inability to transport photosynthetic assimilates below the area of damage. Almost inevitably results in the eventual death of the affected stem or branch above the damage

Root-collar - The transitional area between the stem/s and roots

Sapwood - Living xylem tissues

Soft-rot - A kind of wood decay in which a fungus degrades cellulose within the cell walls, without any general degradation of the wall as a whole

Stem/s - Principle above-ground structural component(s) of a tree that supports its branches

Stress - In plant physiology, a condition under which one or more physiological functions are not operating within their optimum range, for example due to lack of water, inadequate nutrition or extremes of temperature

SRZ (Structural Root Zone) - The area around the base of the tree required for the trees stability in the ground

Subsidence - In relation to soil or structures resting in or on soil, a sinking due to shrinkage when certain types of clay soil dry out, sometimes due to extraction of moisture by tree roots

Taper - In stems and branches, the degree of change in girth along a given length

Targets - In tree risk assessment (with slight misuse of normal meaning) persons or property or other things of value which might be harmed by mechanical failure of the tree or by objects falling from it

Topping - In arboriculture, the removal of the crown of a tree, or of a major proportion of it

Transpiration - The evaporation of moisture from the surface of a plant, especially via the stomata of leaves; it exerts a suction which draws water up from the roots and through the intervening xylem cells

TPZ (Tree Protection Zone) - A specified area above and below ground and at a given 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 development

Understory - This layer consists of younger individuals of the dominant trees, together with smaller trees and shrubs which are adapted to grow under lower light conditions

Veteran tree - Tree that, by recognised criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. These characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem

Vigour - The expression of carbohydrate expenditure to growth (in trees)

White-rot - A range of kinds of wood decay in which lignin, usually together with cellulose and other wood constituents, is degraded

Wind exposure - The degree to which a tree or other object is exposed to wind, both in terms of duration and velocity

Wind pressure - The force exerted by a wind on a particular object

Windthrow - The blowing over of a tree at its roots