
Arboricultural Impact Assessment Report

Site location:

4 Minna Close Belrose NSW

Prepared for: Bureau SRH

Prepared by: Bryce Claassens

Urban Arbor Pty Ltd

Date Prepared: 29 May 2023

Ref: 230529_4 Minna CI_AIA

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1. INTRODUCTION

- 1.1 Urban Arbor have been instructed by Bureau SRH to provide an Arboricultural Impact Assessment Report for trees located within the site and adjoining sites in relation to a proposed development.
- 1.2 Below is a list of all documents and information provided to assist in preparing this report;
 - A) Detail and Level Survey of Lot 502 in DP875858, SDG Land Development Solutions, Ref: 8484, Issue A, 9 June 2021.
 - B) Proposed Architectural Plans, Bureau SRH, Concept Design, Rev 02, 10 May 2023.
- 1.3 The site and tree inspections were carried out on 10 March 2022, 14 March 2022 and 15 March 2022. Access was available to the subject site and adjoining public areas only. All tree data contained in this report was collected during these site inspections.

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 trees identified on the Detail and Level Survey by SDG Land Development Solutions.
 - 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 DAB (Trunk diameter directly above the root buttress) – millimetres.
- 4.1.6 Estimated height - metres
- 4.1.7 Estimated crown spread (radius of crown) - metres
- 4.1.8 Health
- 4.1.9 Structural condition
- 4.1.10 Amenity value
- 4.1.11 Estimated remaining contribution years (SULE)¹
- 4.1.12 Retention value (Tree AZ)²
- 4.1.13 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. SITE LOCATION AND BRIEF DESCRIPTION

- 5.1 The site is located in the suburb of Belrose, New South Wales, which is located in the Northern Beaches Council area. All trees at the site are subject to protection under the Warringah Local Environmental Plan (LEP) 2011⁵ and Warringah Development Control Plan (DCP) 2011.⁶ The site is not located inside a Heritage Conservation Area and does not form part of a heritage item in the LEP heritage maps.⁷
- 5.2 The site is a vacant lot that is densely vegetated. Proposed development works include the removal of vegetation, earthworks, and the construction of a warehouse complex.
- 5.3 All trees included within this report were physically marked with plastic tree identification tags during the site inspections in March 2022. The tags were placed on the Southwest side of the tree at approximately 1.8m above ground height. See Image 1 below.

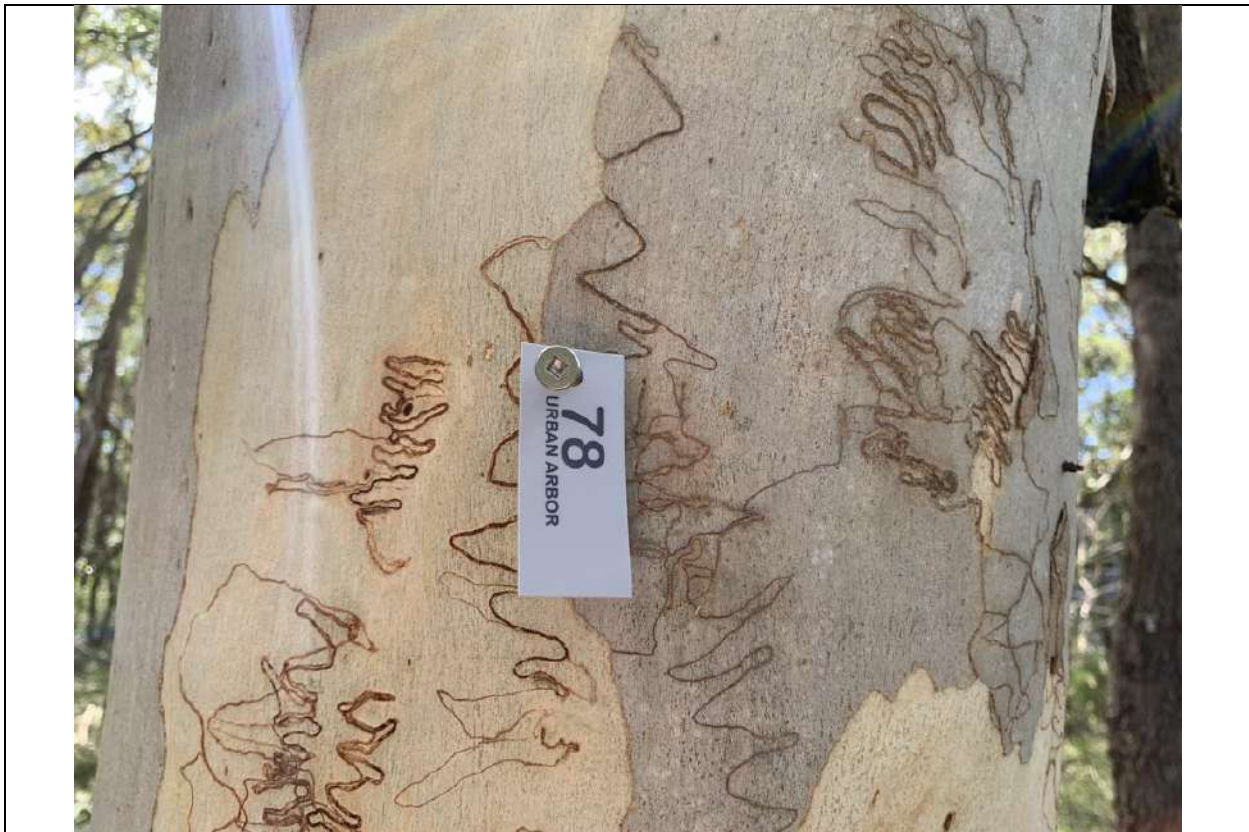


Image 1: Urban Arbor tree identification number tags used at the site.

⁵ Warringah Local Environmental Plan 2011, <https://legislation.nsw.gov.au/#/view/EPI/2011/649>, accessed 15 March 2022.

⁶ Warringah Development Control Plan 2011, <https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/pages/plan/book.aspx?exhibit=DCP>, accessed 15 March 2022.

⁷ Warringah LEP Heritage Mapping - Sheet Her_007, https://eplanningdlprod.blob.core.windows.net/pdfmaps/1800_COM_HER_007_020_20161221.pdf, accessed 15 March 2022.

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

- 6.1 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.
- 6.2 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.
- 6.3 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.

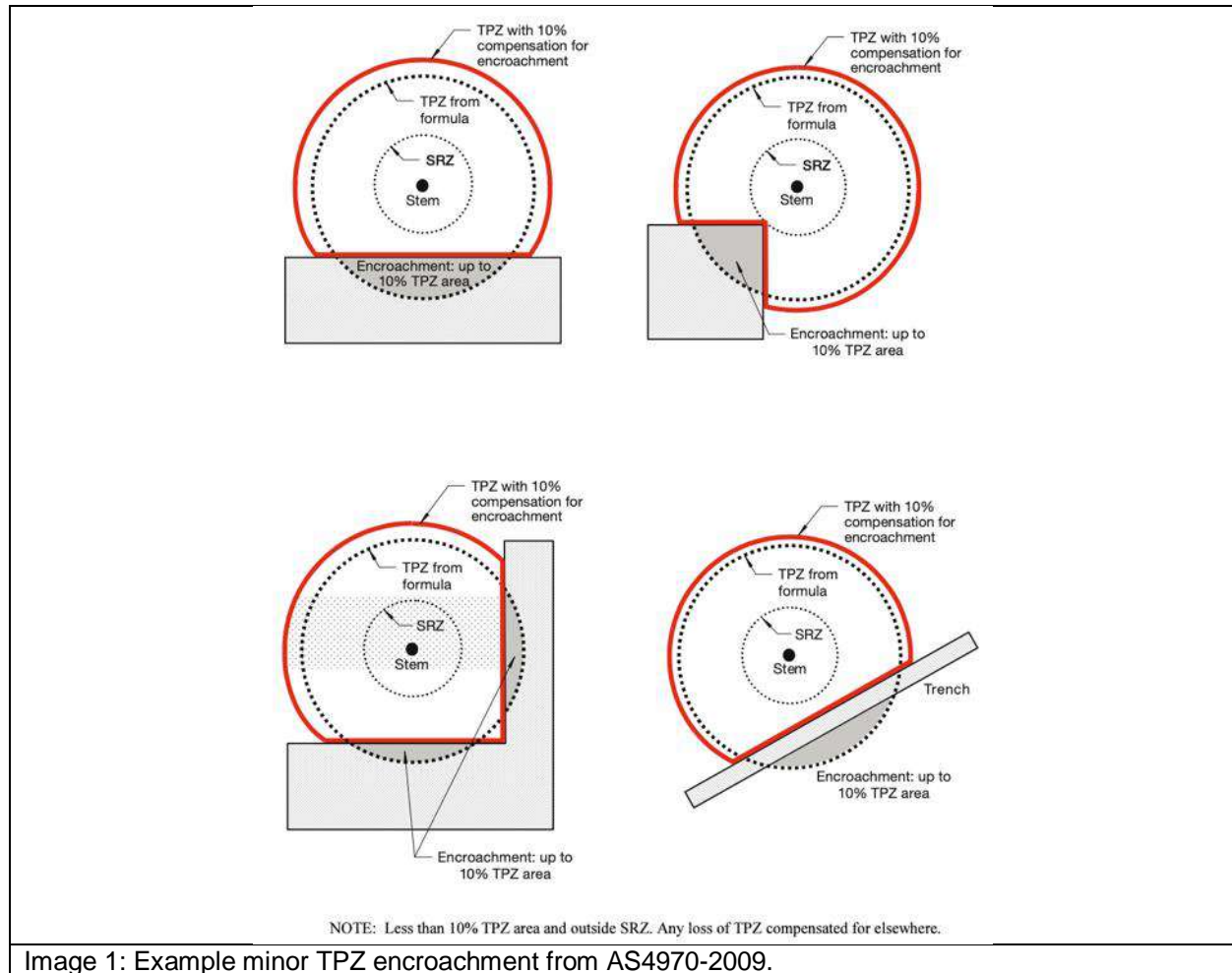


Image 1: Example minor TPZ encroachment from AS4970-2009.

6.4 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).

7. OBSERVATIONS

7.1 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.

7.2 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

8. ASSESSMENT OF CONSTRUCTION IMPACTS

8.1 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 and hard landscaping only. Proposed soil level changes have not been identified in the information provided and have therefore not been assessed. All soft landscaping should be completed in accordance with section 11.10.

Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	<i>Callistemon viminalis</i>	Z1	4.2	55.4	2.1	Major	The tree is located within the nature strip. The proposed driveway crossover will encroach into the TPZ by 16% (8.6m ²) and into the SRZ. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. However, the tree is small/young and the crown has been topped, significantly reducing the likelihood of whole tree failure following root loss/pruning. To reduce the impact to the tree, the proposed driveway crossover should be installed in accordance with section 9.2 of this report.	Tree sensitive construction
2	<i>Eucalyptus capitellata</i>	A1	5.2	84.9	2.4	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
3	<i>Eucalyptus capitellata</i>	A1	5.0	78.5	2.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
4	<i>Angophora costata</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
5	<i>Eucalyptus capitellata</i>	A1	4.2	55.4	2.3	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
6	<i>Eucalyptus capitellata</i>	A1	3.2	32.2	2.3	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
7	<i>Eucalyptus capitellata</i>	A1	3.0	28.3	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
8	<i>Eucalyptus capitellata</i>	Z9	7.2	162.9	2.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove

Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
9	<i>Eucalyptus capitellata</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
10	<i>Corymbia gummifera</i>	A1	3.1	30.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
11	<i>Eucalyptus sieberi</i>	AA	7.4	172.0	2.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
12	<i>Corymbia gummifera</i>	A1	2.6	21.2	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
13	<i>Eucalyptus piperita</i>	A1	5.0	78.5	2.4	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
14	<i>Angophora costata</i>	A1	3.0	28.3	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
15	<i>Eucalyptus capitellata</i>	Z5	7.8	191.1	2.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
16	<i>Eucalyptus sieberi</i>	A1	5.4	91.6	2.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
17	<i>Eucalyptus capitellata</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
18	<i>Eucalyptus capitellata</i>	A1	2.9	26.4	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
19	<i>Eucalyptus capitellata</i>	A1	3.2	32.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
20	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
21	<i>Eucalyptus haemastoma</i>	A1	3.6	40.7	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove

 Site Address: 4 Minna Close, Belrose, NSW.

Prepared for: Bureau SRH.

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

Date prepared: 29 May 2023. Rev: 1.

Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
22	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
23	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
24	<i>Eucalyptus capitellata</i>	Z1	2.2	15.2	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
25	<i>Angophora costata</i>	A1	5.7	102.1	2.5	Major	The proposed driveway and retaining wall excavations will encroach into the TPZ by 33% (34.2m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
26	<i>Eucalyptus capitellata</i>	A1	4.2	55.4	2.3	Major	The proposed driveway and retaining wall excavations will encroach into the TPZ by 15% (8.3m ²) but not into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition of the tree. The tree is recommended for removal due to development impacts.	Remove
27	<i>Eucalyptus capitellata</i>	A1	4.3	58.1	2.3	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
28	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
29	<i>Eucalyptus capitellata</i>	A1	3.0	28.3	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
30	<i>Eucalyptus capitellata</i>	A1	3.7	43.0	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
31	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove

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32	<i>Eucalyptus capitellata</i>	A1	2.6	21.2	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
33	<i>Corymbia gummifera</i>	A1	3.2	32.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
34	<i>Corymbia gummifera</i>	A1	2.6	21.2	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
35	<i>Eucalyptus capitellata</i>	A1	4.8	72.4	2.4	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
36	<i>Eucalyptus capitellata</i>	A1	3.7	43.0	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
37	<i>Corymbia gummifera</i>	A1	4.4	60.8	2.4	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
38	<i>Eucalyptus capitellata</i>	AA	6.5	132.7	2.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
39	<i>Corymbia gummifera</i>	Z4	3.5	38.5	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
40	<i>Eucalyptus haemastoma</i>	A2	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
41	<i>Corymbia gummifera</i>	Z10	2.4	18.1	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
42	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
43	<i>Eucalyptus piperita</i>	Z1	2.2	15.2	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
44	<i>Angophora costata</i>	A1	2.4	18.1	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove

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45	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
46	<i>Eucalyptus capitellata</i>	A1	3.1	30.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
47	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
48	<i>Eucalyptus haemastoma</i>	Z1	2.2	15.2	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
49	<i>Corymbia gummifera</i>	A1	2.9	26.4	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
50	<i>Corymbia gummifera</i>	A1	3.1	30.2	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
51	<i>Eucalyptus capitellata</i>	AA	6.5	132.7	2.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
52	<i>Eucalyptus sieberi</i>	A1	5.5	95.0	2.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
53	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
54	<i>Eucalyptus capitellata</i>	A1	3.7	43.0	2.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
55	<i>Eucalyptus sieberi</i>	A1	5.2	84.9	2.6	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
56	<i>Eucalyptus haemastoma</i>	Z5	5.1	81.7	3.3	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
57	<i>Corymbia gummifera</i>	A1	3.1	30.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove

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58	<i>Corymbia gummifera</i>	A1	2.9	26.4	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
59	<i>Eucalyptus capitellata</i>	A1	3.6	40.7	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
60	<i>Corymbia gummifera</i>	A1	2.5	19.6	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
61	<i>Eucalyptus capitellata</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
62	<i>Corymbia gummifera</i>	A1	3.1	30.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
63	<i>Eucalyptus sieberi</i>	A1	2.8	24.6	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
64	<i>Eucalyptus sieberi</i>	Z1	2.0	12.6	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
65	<i>Allocasuarina littoralis</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
66	<i>Corymbia gummifera</i>	A1	3.0	28.3	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
67	<i>Eucalyptus capitellata</i>	A1	4.0	50.3	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
68	<i>Corymbia gummifera</i>	Z1	2.2	15.2	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
69	<i>Banksia ericifolia</i>	Z1	2.0	12.6	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
70	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove

 Site Address: 4 Minna Close, Belrose, NSW.

Prepared for: Bureau SRH.

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

Date prepared: 29 May 2023. Rev: 1.

Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
71	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
72	<i>Eucalyptus haemastoma</i>	A1	3.0	28.3	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
73	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
74	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
75	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
76	<i>Eucalyptus haemastoma</i>	A2	8.4	221.7	3.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
77	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
78	<i>Eucalyptus haemastoma</i>	A1	4.8	72.4	3.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
79	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
80	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
81	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
82	<i>Corymbia gummifera</i>	Z1	2.2	15.2	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
83	<i>Corymbia gummifera</i>	A1	3.0	28.3	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
84	<i>Corymbia gummifera</i>	A1	2.8	24.6	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
85	<i>Angophora costata</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
86	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
87	<i>Angophora costata</i>	A1	4.0	50.3	2.3	Footprint	The trunk of the tree will be located within the footprint of the proposed driveway excavations.	Remove
88	<i>Corymbia gummifera</i>	A1	3.1	30.2	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
89	<i>Eucalyptus capitellata</i>	A1	3.6	40.7	2.1	Major	The proposed driveway and retaining wall excavations will encroach into the TPZ by 14% (5.8m ²) but not into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition of the tree. The tree is recommended for removal due to development impacts.	Remove
90	<i>Corymbia gummifera</i>	A1	4.0	50.3	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed driveway excavations.	Remove
91	<i>Eucalyptus haemastoma</i>	A1	4.8	72.4	2.4	Footprint	The trunk of the tree will be located within the footprint of the proposed driveway excavations.	Remove
92	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
93	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.2	Major	The proposed driveway and retaining wall excavations will encroach into the TPZ by 25% (10m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
94	<i>Eucalyptus haemastoma</i>	A1	2.4	18.1	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
95	<i>Angophora costata</i>	A1	3.2	32.2	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
96	<i>Angophora costata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
97	<i>Corymbia gummifera</i>	A1	3.9	47.8	2.5	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
98	<i>Banksia serrata</i>	Z1	2.0	12.6	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
99	<i>Angophora costata</i>	Z1	2.0	12.6	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
100	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
101	<i>Eucalyptus capitellata</i>	A1	3.4	36.3	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
102	<i>Corymbia gummifera</i>	Z1	2.2	15.2	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
103	<i>Corymbia gummifera</i>	A1	2.9	26.4	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
104	<i>Eucalyptus capitellata</i>	A1	3.0	28.3	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
105	<i>Eucalyptus capitellata</i>	A1	3.6	40.7	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
106	<i>Corymbia gummifera</i>	A1	4.1	52.8	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
107	<i>Eucalyptus sieberi</i>	A1	4.2	55.4	2.3	Minor	The proposed driveway and retaining wall excavations will encroach into the TPZ by 9% (5.2m ²) but not into the SRZ. This is considered to be a minor and acceptable TPZ encroachment. The proposed works will not significantly impact the tree.	Retain and protect
108	<i>Eucalyptus sieberi</i>	A1	3.7	43.0	2.6	Minor	The proposed driveway and retaining wall excavations will encroach into the TPZ by 5% (2.1m ²) but not into the SRZ. This is considered to be a minor and acceptable TPZ encroachment. The proposed works will not significantly impact the tree.	Retain and protect
109	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.7	None	No proposed TPZ encroachment.	Retain and protect
110	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	Major	The proposed driveway and retaining wall excavations will encroach into the TPZ by 45% (18.2m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
111	<i>Banksia ericifolia</i>	Z1	2.0	12.6	1.5	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
112	<i>Corymbia gummifera</i>	A1	2.8	24.6	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
113	<i>Angophora costata</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
114	<i>Angophora costata</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
115	<i>Corymbia gummifera</i>	A1	5.5	95.0	2.5	Major	The proposed driveway and retaining wall excavations will encroach into the TPZ by 27% (25.7m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
116	<i>Allocasuarina littoralis</i>	Z1	2.0	12.6	1.6	Major	The proposed driveway and retaining wall excavations will encroach into the TPZ by 6% (0.8m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
117	<i>Eucalyptus sieberi</i>	AA	6.4	128.7	2.7	None	The tree is located in the adjoining property. No proposed TPZ encroachment.	Retain and protect
118	<i>Eucalyptus sieberi</i>	A1	4.9	75.4	2.5	None	No proposed TPZ encroachment.	Retain and protect
119	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	None	No proposed TPZ encroachment.	Retain and protect
120	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
121	<i>Eucalyptus capitellata</i>	A1	3.1	30.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
122	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.7	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
123	<i>Eucalyptus haemastoma</i>	A1	2.6	21.2	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
124	<i>Corymbia gummifera</i>	A1	4.4	60.8	2.9	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
125	<i>Angophora costata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
126	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed building excavations.	Remove
127	<i>Eucalyptus haemastoma</i>	A1	3.3	34.2	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
128	<i>Corymbia gummifera</i>	AA	7.8	191.1	3.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
129	<i>Eucalyptus capitellata</i>	A1	2.8	24.6	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
130	<i>Eucalyptus capitellata</i>	A1	3.6	40.7	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
131	<i>Eucalyptus haemastoma</i>	Z9	9.0	254.5	3.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
132	<i>Banksia serrata</i>	Z1	2.0	12.6	1.8	Major	The proposed retaining wall excavations will encroach into the TPZ by 10% (1.3m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
133	<i>Corymbia gummifera</i>	A1	3.0	28.3	2.0	Major	The proposed retaining wall excavations will encroach into the TPZ by 26% (7.3m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove

Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
134	<i>Eucalyptus capitellata</i>	A1	3.8	45.4	2.1	Major	The proposed retaining wall excavations will encroach into the TPZ by 38% (17.3m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
135	<i>Banksia serrata</i>	A1	3.2	32.2	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
136	<i>Eucalyptus capitellata</i>	A1	4.0	50.3	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
137	<i>Corymbia gummifera</i>	A1	3.1	30.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
138	<i>Eucalyptus haemastoma</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
139	<i>Eucalyptus haemastoma</i>	A1	2.6	21.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed retaining wall excavations.	Remove
140	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	Minor	The proposed retaining wall excavations will encroach into the TPZ by 9% (3.6m ²) but not into the SRZ. This is considered to be a minor and acceptable TPZ encroachment. The proposed works will not significantly impact the tree.	Retain and protect
141	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.9	None	No proposed TPZ encroachment.	Retain and protect
142	<i>Eucalyptus sieberi</i>	A1	2.9	26.4	2.3	None	No proposed TPZ encroachment.	Retain and protect
143	<i>Angophora costata</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect

Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
144	<i>Corymbia gummifera</i>	Z9	5.2	84.9	2.5	Major	The proposed retaining wall excavations will encroach into the TPZ by 11% (9.3m ²) but not into the SRZ. This is just 1% over the threshold for minor TPZ encroachment. The tree was displaying good health during the site inspection indicating the tree can tolerate some root disturbance. Therefore, the proposed development works will not significantly impact the tree.	Retain and protect
145	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.8	None	No proposed TPZ encroachment.	Retain and protect
146	<i>Eucalyptus sieberi</i>	A1	5.2	84.9	2.7	None	No proposed TPZ encroachment.	Retain and protect
147	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.2	None	No proposed TPZ encroachment.	Retain and protect
148	<i>Eucalyptus sieberi</i>	AA	6.5	132.7	2.8	None	No proposed TPZ encroachment.	Retain and protect
149	<i>Ceratopetalum gummiferum</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
150	<i>Ceratopetalum gummiferum</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
151	<i>Ceratopetalum gummiferum</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
152	<i>Ceratopetalum gummiferum</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
153	<i>Ceratopetalum gummiferum</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
154	<i>Corymbia gummifera</i>	A1	4.3	58.1	2.3	None	No proposed TPZ encroachment.	Retain and protect
155	<i>Corymbia gummifera</i>	A1	5.3	88.2	2.4	None	No proposed TPZ encroachment.	Retain and protect

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156	<i>Eucalyptus sieberi</i>	A1	3.4	36.3	2.1	None	The tree is located in the adjoining property. No proposed TPZ encroachment.	Retain and protect
157	<i>Eucalyptus sieberi</i>	A1	4.0	50.3	2.2	None	The tree is located in the adjoining property. No proposed TPZ encroachment.	Retain and protect
158	<i>Angophora costata</i>	Z1	2.0	12.6	1.6	None	The tree is located in the adjoining property. No proposed TPZ encroachment.	Retain and protect
159	<i>Angophora costata</i>	Z1	2.0	12.6	1.6	None	The tree is located in the adjoining property. No proposed TPZ encroachment.	Retain and protect
160	<i>Corymbia gummifera</i>	Z1	2.2	15.2	1.7	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
161	<i>Eucalyptus capitellata</i>	A1	4.1	52.8	2.2	None	No proposed TPZ encroachment.	Retain and protect
162	<i>Eucalyptus piperita</i>	A1	2.4	18.1	1.8	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
163	<i>Eucalyptus capitellata</i>	A1	3.1	30.2	2.0	None	No proposed TPZ encroachment.	Retain and protect
164	<i>Angophora costata</i>	A1	2.6	21.2	1.8	None	No proposed TPZ encroachment.	Retain and protect
165	<i>Eucalyptus sieberi</i>	A1	5.3	88.2	2.5	None	No proposed TPZ encroachment.	Retain and protect
166	<i>Eucalyptus capitellata</i>	A1	3.9	47.8	2.3	None	No proposed TPZ encroachment.	Retain and protect
167	<i>Corymbia gummifera</i>	A1	4.4	60.8	2.3	None	No proposed TPZ encroachment.	Retain and protect
168	<i>Angophora costata</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect

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169	<i>Eucalyptus piperita</i>	A1	4.7	69.4	2.6	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
170	<i>Eucalyptus capitellata</i>	A1	5.6	98.5	2.5	None	No proposed TPZ encroachment.	Retain and protect
171	<i>Eucalyptus sieberi</i>	A1	3.0	28.3	1.9	None	No proposed TPZ encroachment.	Retain and protect
172	<i>Eucalyptus sieberi</i>	A1	3.0	28.3	1.9	None	No proposed TPZ encroachment.	Retain and protect
173	<i>Corymbia gummifera</i>	A1	2.6	21.2	2.0	None	No proposed TPZ encroachment.	Retain and protect
174	<i>Eucalyptus sieberi</i>	A1	4.0	50.3	2.2	None	No proposed TPZ encroachment.	Retain and protect
175	<i>Eucalyptus capitellata</i>	A1	2.6	21.2	1.9	None	No proposed TPZ encroachment.	Retain and protect
176	<i>Eucalyptus capitellata</i>	Z1	2.2	15.2	1.7	None	No proposed TPZ encroachment.	Retain and protect
177	<i>Eucalyptus sieberi</i>	A1	4.2	55.4	2.2	None	No proposed TPZ encroachment.	Retain and protect
178	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	None	No proposed TPZ encroachment.	Retain and protect
179	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.7	None	No proposed TPZ encroachment.	Retain and protect
180	<i>Corymbia gummifera</i>	Z4	3.0	28.3	2.1	None	No proposed TPZ encroachment.	Retain and protect
181	<i>Corymbia gummifera</i>	A1	2.6	21.2	1.9	None	No proposed TPZ encroachment.	Retain and protect

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
182	<i>Eucalyptus capitellata</i>	A1	3.0	28.3	1.9	None	No proposed TPZ encroachment.	Retain and protect
183	<i>Corymbia gummifera</i>	A1	3.2	32.2	2.0	None	No proposed TPZ encroachment.	Retain and protect
184	<i>Eucalyptus capitellata</i>	A1	3.1	30.2	2.0	None	No proposed TPZ encroachment.	Retain and protect
185	<i>Corymbia gummifera</i>	Z4	4.6	66.5	2.3	None	No proposed TPZ encroachment.	Retain and protect
186	<i>Corymbia gummifera</i>	Z1	2.2	15.2	1.7	None	No proposed TPZ encroachment.	Retain and protect
187	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
188	<i>Banksia serrata</i>	ZZ 4	5.0	78.5	2.4	None	No proposed TPZ encroachment.	Retain and protect
189	<i>Corymbia gummifera</i>	A1	4.8	72.4	2.4	None	No proposed TPZ encroachment.	Retain and protect
190	<i>Eucalyptus capitellata</i>	Z9	3.4	36.3	2.0	None	No proposed TPZ encroachment.	Retain and protect
191	<i>Eucalyptus piperita</i>	A1	3.2	32.2	2.0	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
192	<i>Eucalyptus piperita</i>	A1	3.2	32.2	2.0	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
193	<i>Eucalyptus piperita</i>	A1	3.2	32.2	2.0	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
194	<i>Eucalyptus capitellata</i>	A1	2.9	26.4	2.4	None	No proposed TPZ encroachment.	Retain and protect

 Site Address: 4 Minna Close, Belrose, NSW.

Prepared for: Bureau SRH.

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
195	<i>Corymbia gummifera</i>	A1	3.0	28.3	2.0	None	No proposed TPZ encroachment.	Retain and protect
196	<i>Eucalyptus sieberi</i>	A1	4.1	52.8	2.3	None	No proposed TPZ encroachment.	Retain and protect
197	<i>Banksia serrata</i>	A1	3.8	45.4	2.2	None	No proposed TPZ encroachment.	Retain and protect
198	<i>Corymbia gummifera</i>	Z4	3.6	40.7	2.1	None	No proposed TPZ encroachment.	Retain and protect
199	<i>Corymbia gummifera</i>	A1	3.1	30.2	2.0	None	No proposed TPZ encroachment.	Retain and protect
200	<i>Banksia serrata</i>	Z9	3.4	36.3	2.1	None	No proposed TPZ encroachment.	Retain and protect
201	<i>Corymbia gummifera</i>	AA	6.1	116.9	2.6	None	No proposed TPZ encroachment.	Retain and protect
202	<i>Eucalyptus capitellata</i>	Z1	2.0	12.6	1.6	None	No proposed TPZ encroachment.	Retain and protect
203	<i>Eucalyptus piperita</i>	A1	2.8	24.6	1.9	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
204	<i>Eucalyptus piperita</i>	Z1	2.2	15.2	1.7	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
205	<i>Eucalyptus piperita</i>	A1	3.8	45.4	2.1	None	The tree is located in the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
206	<i>Corymbia gummifera</i>	AA	7.3	167.4	3.3	None	No proposed TPZ encroachment.	Retain and protect
207	<i>Eucalyptus capitellata</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
208	<i>Ceratopetalum gummiferum</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
209	<i>Banksia serrata</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
210	<i>Banksia serrata</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
211	<i>Eucalyptus sieberi</i>	Z9	5.2	84.9	2.7	None	No proposed TPZ encroachment.	Retain and protect
212	<i>Eucalyptus sieberi</i>	A1	4.1	52.8	2.5	None	No proposed TPZ encroachment.	Retain and protect
213	<i>Corymbia gummifera</i>	A1	2.5	19.6	1.8	None	No proposed TPZ encroachment.	Retain and protect
214	<i>Eucalyptus sieberi</i>	A1	3.2	32.2	2.1	None	No proposed TPZ encroachment.	Retain and protect
215	<i>Eucalyptus sieberi</i>	AA	7.0	153.9	2.9	None	No proposed TPZ encroachment.	Retain and protect
216	<i>Banksia serrata</i>	A1	2.2	15.2	2.1	None	No proposed TPZ encroachment.	Retain and protect
217	<i>Eucalyptus sieberi</i>	Z9	2.3	16.6	1.7	None	No proposed TPZ encroachment.	Retain and protect
218	<i>Corymbia gummifera</i>	Z1	2.0	12.6	1.6	None	No proposed TPZ encroachment.	Retain and protect
219	<i>Ceratopetalum gummiferum</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
220	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	None	No proposed TPZ encroachment.	Retain and protect

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
221	<i>Corymbia gummifera</i>	A1	2.4	18.1	1.8	None	No proposed TPZ encroachment.	Retain and protect
222	<i>Eucalyptus sieberi</i>	A1	2.6	21.2	1.8	None	No proposed TPZ encroachment.	Retain and protect
223	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	None	No proposed TPZ encroachment.	Retain and protect
224	<i>Corymbia gummifera</i>	A1	3.7	43.0	2.1	None	No proposed TPZ encroachment.	Retain and protect
225	<i>Eucalyptus sieberi</i>	Z9	3.5	38.5	2.1	None	No proposed TPZ encroachment.	Retain and protect
226	<i>Corymbia gummifera</i>	A1	2.8	24.6	1.8	None	No proposed TPZ encroachment.	Retain and protect
227	<i>Eucalyptus sieberi</i>	A1	3.5	38.5	2.1	None	No proposed TPZ encroachment.	Retain and protect
228	<i>Eucalyptus sieberi</i>	A1	4.0	50.3	2.2	None	No proposed TPZ encroachment.	Retain and protect
229	<i>Eucalyptus sieberi</i>	A1	4.0	50.3	2.2	None	No proposed TPZ encroachment.	Retain and protect
230	<i>Eucalyptus sieberi</i>	A1	5.1	81.7	2.6	None	No proposed TPZ encroachment.	Retain and protect
231	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	None	No proposed TPZ encroachment.	Retain and protect
232	<i>Angophora costata</i>	A1	2.4	18.1	1.8	None	No proposed TPZ encroachment.	Retain and protect
233	<i>Eucalyptus capitellata</i>	A1	3.7	43.0	2.1	None	No proposed TPZ encroachment.	Retain and protect

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
234	<i>Eucalyptus sieberi</i>	Z9	2.5	19.6	1.9	None	No proposed TPZ encroachment.	Retain and protect
235	<i>Corymbia gummifera</i>	A1	2.8	24.6	1.8	None	No proposed TPZ encroachment.	Retain and protect
236	<i>Eucalyptus capitellata</i>	A1	4.2	55.4	2.5	None	No proposed TPZ encroachment.	Retain and protect
237	<i>Eucalyptus piperita</i>	Z1	2.0	12.6	1.6	None	The tree is located within the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
238	<i>Eucalyptus piperita</i>	A1	3.8	45.4	2.1	None	The tree is located within the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
239	<i>Eucalyptus piperita</i>	A1	4.1	52.8	2.3	None	The tree is located within the adjoining nature strip. No proposed TPZ encroachment.	Retain and protect
240	<i>Corymbia gummifera</i>	A1	3.6	40.7	2.1	None	No proposed TPZ encroachment.	Retain and protect
241	<i>Banksia serrata</i>	A1	2.8	24.6	1.9	None	No proposed TPZ encroachment.	Retain and protect
242	<i>Eucalyptus sieberi</i>	A1	5.6	98.5	2.6	None	No proposed TPZ encroachment.	Retain and protect
243	<i>Eucalyptus sieberi</i>	A1	3.6	40.7	2.1	None	No proposed TPZ encroachment.	Retain and protect
244	<i>Corymbia gummifera</i>	A1	4.0	50.3	2.2	None	No proposed TPZ encroachment.	Retain and protect
245	<i>Eucalyptus sieberi</i>	A1	2.4	18.1	1.9	None	No proposed TPZ encroachment.	Retain and protect
246	<i>Corymbia gummifera</i>	A1	3.8	45.4	2.1	None	No proposed TPZ encroachment.	Retain and protect

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
247	<i>Eucalyptus sieberi</i>	A1	3.8	45.4	2.4	None	No proposed TPZ encroachment.	Retain and protect
248	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	None	No proposed TPZ encroachment.	Retain and protect
249	<i>Eucalyptus capitellata</i>	A1	3.8	45.4	2.2	None	No proposed TPZ encroachment.	Retain and protect
250	<i>Eucalyptus capitellata</i>	A1	4.3	58.1	2.3	Minor	The proposed retaining wall excavations will encroach into the TPZ by 9% (5m ²) but not into the SRZ. This is considered to be a minor and acceptable TPZ encroachment. The proposed works will not significantly impact the tree.	Retain and protect
251	<i>Corymbia gummifera</i>	A1	4.2	55.4	2.2	Major	The proposed retaining wall excavations will encroach into the TPZ by 42% (23.2m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
252	<i>Eucalyptus capitellata</i>	A1	3.2	32.2	2.2	Major	The proposed retaining wall excavations will encroach into the TPZ by 30% (9.8m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
253	<i>Corymbia gummifera</i>	A1	4.1	52.8	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
254	<i>Banksia serrata</i>	A1	3.5	38.5	2.1	None	No proposed TPZ encroachment.	Retain and protect
255	<i>Eucalyptus capitellata</i>	Z1	2.0	12.6	1.6	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
256	<i>Eucalyptus capitellata</i>	A1	2.9	26.4	1.9	Major	The proposed retaining wall excavations will encroach into the TPZ by 33% (8.7m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
257	<i>Eucalyptus capitellata</i>	A1	2.4	18.1	1.8	None	No proposed TPZ encroachment.	Retain and protect
258	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	Major	The proposed retaining wall excavations will encroach into the TPZ by 20% (5.6m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
259	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	Major	The proposed retaining wall excavations will encroach into the TPZ by 27% (7.5m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
260	<i>Eucalyptus sieberi</i>	A1	2.4	18.1	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
261	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
262	<i>Eucalyptus sieberi</i>	A1	3.2	32.2	2.1	Major	The proposed retaining wall excavations will encroach into the TPZ by 30% (9.6m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
263	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	Footprint	The trunk of the tree will be located within the footprint of the proposed retaining wall excavations.	Remove
264	<i>Corymbia gummifera</i>	A1	3.5	38.5	2.0	Major	The proposed retaining wall excavations will encroach into the TPZ by 43% (16.5m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
265	<i>Corymbia gummifera</i>	Z1	2.3	16.6	1.7	Major	The proposed retaining wall excavations will encroach into the TPZ by 14% (2.4m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
266	<i>Corymbia gummifera</i>	A1	5.2	84.9	2.4	Major	The proposed retaining wall excavations will encroach into the TPZ by 30% (25.3m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
267	<i>Eucalyptus capitellata</i>	A1	3.6	40.7	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed retaining wall excavations.	Remove

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
268	<i>Corymbia gummifera</i>	A1	3.0	28.3	1.9	Major	The proposed retaining wall excavations will encroach into the TPZ by 30% (8.6m ²) and into the SRZ. Additional excavations will likely be required for drainage behind the retaining wall. This is considered to be a major TPZ encroachment, indicating the proposed works could potentially impact the condition and stability of the tree. The tree is recommended for removal due to development impacts.	Remove
269	<i>Eucalyptus sieberi</i>	Z1	2.0	12.6	1.5	None	No proposed TPZ encroachment.	Retain and protect
270	<i>Eucalyptus capitellata</i>	A1	3.4	36.3	2.1	None	No proposed TPZ encroachment.	Retain and protect
271	<i>Corymbia gummifera</i>	A1	3.8	45.4	2.1	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
272	<i>Eucalyptus capitellata</i>	A1	3.0	28.3	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
273	<i>Corymbia gummifera</i>	A1	4.1	52.8	2.2	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
274	<i>Eucalyptus sieberi</i>	Z9	3.6	40.7	2.4	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
275	<i>Banksia serrata</i>	A1	2.8	24.6	1.8	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations.	Remove
276	<i>Corymbia gummifera</i>	ZZ 4	3.1	30.2	2.0	Footprint	The trunk of the tree will be located within the footprint of the proposed hard surfacing excavations. The tree is dead.	Remove
277	<i>Corymbia gummifera</i>	Z4	2.4	18.1	1.8	None	No proposed TPZ encroachment.	Retain and protect
278	<i>Eucalyptus haemastoma</i>	Z1	2.2	15.2	1.8	None	No proposed TPZ encroachment.	Retain and protect
279	<i>Corymbia gummifera</i>	A1	3.7	43.0	2.1	None	No proposed TPZ encroachment.	Retain and protect

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Tree ID	Species	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
280	<i>Eucalyptus capitellata</i>	A1	4.8	72.4	2.5	None	No proposed TPZ encroachment.	Retain and protect

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9. CONCLUSIONS

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

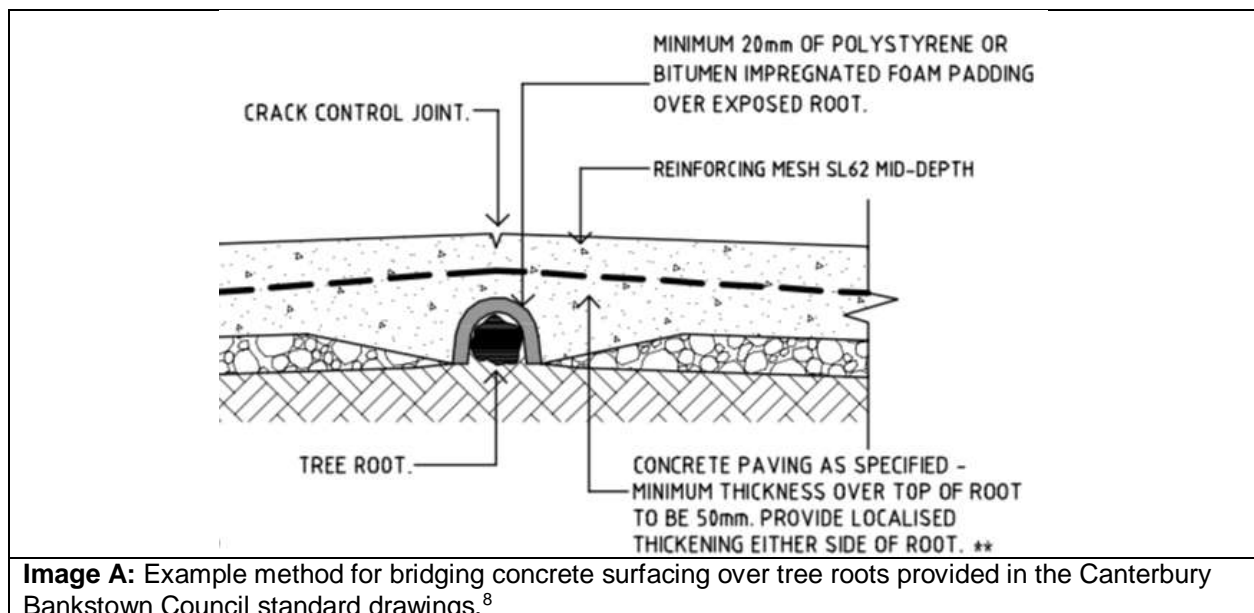
Impact	Reason	Category A		Category Z		Total
		AA	A	Z	ZZ	
Trees recommended to be removed	Building construction, new surfacing and/or proximity, or trees in poor condition.	11, 38, 51, 128	2, 3, 5, 6, 7, 10, 12, 13, 14, 16, 17, 18, 19, 21, 25, 26, 27, 28, 29, 30, 32, 33, 34, 35, 36, 37, 40, 42, 44, 45, 46, 47, 49, 50, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 63, 65, 66, 67, 71, 72, 74, 75, 76, 78, 80, 83, 84, 85, 87, 88, 89, 90, 91, 93, 94, 95, 97, 100, 101, 103, 104, 105, 106, 110, 112, 115, 121, 123, 124, 127, 129, 130, 133, 134, 135, 136, 137, 139, 251, 252, 253, 256, 258, 259, 260, 261, 262, 263, 264, 266, 267, 268, 271, 272, 273, 275	4, 8, 9, 15, 20, 22, 23, 24, 31, 39, 41, 43, 48, 56, 64, 68, 69, 70, 73, 77, 79, 81, 82, 86, 96, 98, 99, 102, 111, 116, 122, 125, 126, 131, 132, 138, 255, 265, 274	276	150 trees
Trees recommended to be retained requiring tree sensitive construction methods	Installation of new surfacing may impact the viability of the trees	None	None	1	None	1 tree
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	117, 148, 201, 206, 215	107, 108, 118, 140, 141, 142, 145, 146, 147, 154, 155, 156, 157, 161, 162, 163, 164, 165, 166, 167, 169, 170, 171, 172, 173, 174, 175, 177, 178, 181, 182, 183, 184, 189, 191, 192, 193, 194, 195, 196, 197, 199, 203, 205, 212, 213, 214, 216, 220, 221, 222, 223, 224, 226, 227, 228, 229, 230, 231, 232, 233, 235, 236, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 254, 257, 270, 279, 280	92, 109, 113, 114, 119, 120, 143, 144, 149, 150, 151, 152, 153, 158, 159, 160, 168, 176, 179, 180, 185, 186, 187, 190, 198, 200, 202, 204, 207, 208, 209, 210, 211, 217, 218, 219, 225, 234, 237, 269, 277, 278	188	129 trees

9.2 Construction Design/Specification Requirements for Tree 1: The proposed construction will encroach into the TPZ and SRZ of tree 1 (located within the nature strip). To ensure the tree is not adversely impacted by the construction, it must be demonstrated the following design and construction specifications can be implemented within the TPZ of the tree.

9.2.1 Tree Sensitive Driveway Crossover Hard Surfacing Construction: To reduce the impact to the tree, the hard surfacing must be constructed in a tree sensitive method. If possible, the proposed driveway crossover should be constructed above existing grades. This may be impractical due to the heights of the existing footpath and road.

If excavations are essential, they must not exceed 200mm below the existing grades. The excavations should be supervised by a project Arborist with a minimum AQF level 5 qualification. All excavations for the hard surfacing 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, the hard surfacing should be elevated over the individual tree root to allow for its retention. An example method that can be used to bridge individual tree roots has been included below (Image A).



⁸ Canterbury Bankstown Council standard drawing S-209 Existing street tree treatments, <https://www.cbcity.nsw.gov.au/development/planning-control-policies/council-standard-drawings>, accessed 3 October 2019.

10. RECOMMENDATIONS

- 10.1 This report assesses the impact of a proposed development at the subject site to all trees identified on the Detail and Level Survey by SDG Land Development Solutions. Two-hundred and eighty (280) trees have been identified and assessed.
- 10.2 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
 - Appendix 1B: Proposed Site Plan
- 10.3 One-hundred and fifty (150) trees have been recommended for removal to accommodate the development works, including tree 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 110, 111, 112, 115, 116, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 251, 252, 253, 255, 256, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 271, 272, 273, 274, 275 and 276. Refer to section 9.1, Table 2 for a list of the trees recommended to be removed by retention value.
- 10.4 One tree has been identified that requires tree sensitive construction methods to be retained in a viable condition, tree 1. Tree 1 is located within the nature strip. To reduce the impact to tree 1, the proposed driveway crossover within the TPZ must be installed in accordance with section 9.2 of this report.
- 10.5 The remaining one-hundred and twenty-nine (129) trees can be retained in a viable condition, including tree 92, 107, 108, 109, 113, 114, 117, 118, 119, 120, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 254, 257, 269, 270, 277, 278, 279 and 280.
- 10.6 All trees to be retained must be protected in accordance with AS4970-2009, details of which are included in section 11.
- 10.7 No landscape plan has been assessed in this report. See section 11.10 for general guidance in relation to minimising the impact of proposed landscaping to retained trees and replacement tree planting.
- 10.8 No services plan has been assessed in this report, all services plans should be subject to review by a consulting Arborist. 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 in accordance with AS4970-2009, see section 11.11 for more information.
- 10.9 This report does not provide approval for tree removal. All recommendations in this report are subject to approval by Northern Beaches Council. This report should be submitted as supporting evidence with the development application.

11. TREE PROTECTION REQUIREMENTS

- 11.1 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. Appendix 1B includes the recommended location of tree protection overlaid onto the proposed site plan.
- 11.2 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.
- 11.3 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).
- 11.4 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.
- 11.5 Site Specific Tree Protection Recommendations:** It is the responsibility of the principal contractor to install tree protection prior to works commencing at the site (prior to demolition works) and to ensure that the tree protection remains in adequate condition for the duration of the development. The tree protection must not be moved without prior agreement of the project Arborist. The project Arborist must inspect that the tree protection has been installed in accordance with this document and AS4970-2009 prior to works commencing. See section 11.6 for requirements of tree protection. See Appendix 1 for indicative fencing location.
- **Tree 92, 107, 108, 109, 117, 118, 119, 120, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 254, 257, 269, 270, 277, 278, 279 and 280:** Protective fencing should be installed to create a combined TPZ exclusion zone for the trees. The fencing should be setback from the proposed retaining wall

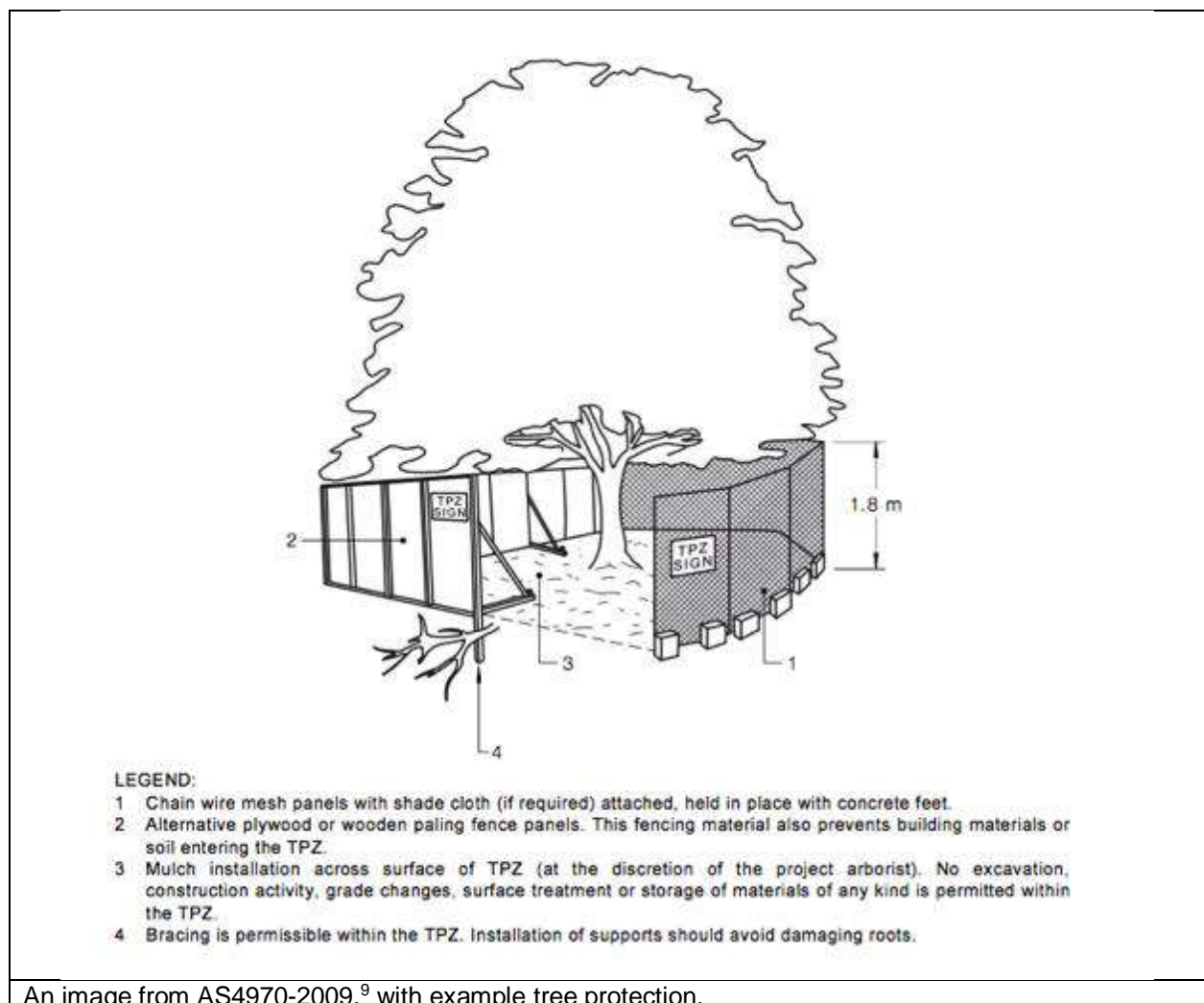
by 1m to allow for the proposed works. TPZ signage is required on the fencing. The fencing must be maintained in adequate condition for the duration of the development. The fencing can only be moved under the supervision and approval of the project arborist.

- **Tree 113 and 114:** Protective fencing should be installed to create a combined TPZ exclusion zone for the trees. The fencing should be setback from the proposed retaining wall by 1m to allow for the proposed works. TPZ signage is required on the fencing. The fencing must be maintained in adequate condition for the duration of the development. The fencing can only be moved under the supervision and approval of the project arborist.

11.6 Tree Protection Specifications:

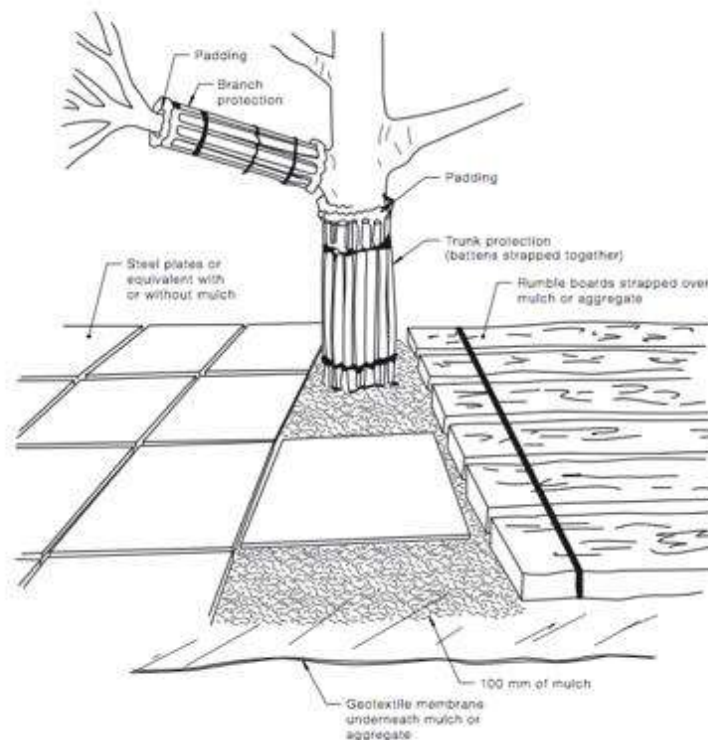
- 11.6.1 Trunk and Branch Protection: The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm or similar) should then be placed around tree trunk. The timber planks should be spaced at 100mm intervals, and must be fixed against the trunk with tie 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.
- 11.6.2 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.
- 11.6.3 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
- 11.6.4 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.

- 11.6.5 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.
- 11.6.6 Temporary irrigation: Temporary irrigation should distribute water evenly throughout the area of the TPZ. The irrigation should be used for at minimum two hours weekly throughout all stages of the development, and may be required a higher frequency, this should be advised by the project Arborist.



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.



NOTES:

1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

An image from AS4970-2009,¹⁰ with example tree protection.

11.7 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) Refueling.
- 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.

- 11.8 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.
- 11.9 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 30mm in diameter is to be carried out without approval of the project arborist. All pruning of roots greater than 30mm 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.
- 11.10 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 11.9.
 - 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.

- 11.11 **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 30mm in diameter should be severed during the installation of service pipes unless approved in writing by the project Arborist.
- 11.12 **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.
- 11.13 **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.
- 11.14 **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.

12. CONSTRUCTION HOLD POINTS FOR TREE PROTECTION

12.1 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 30mm inside TPZ. All root pruning of roots greater than 30mm 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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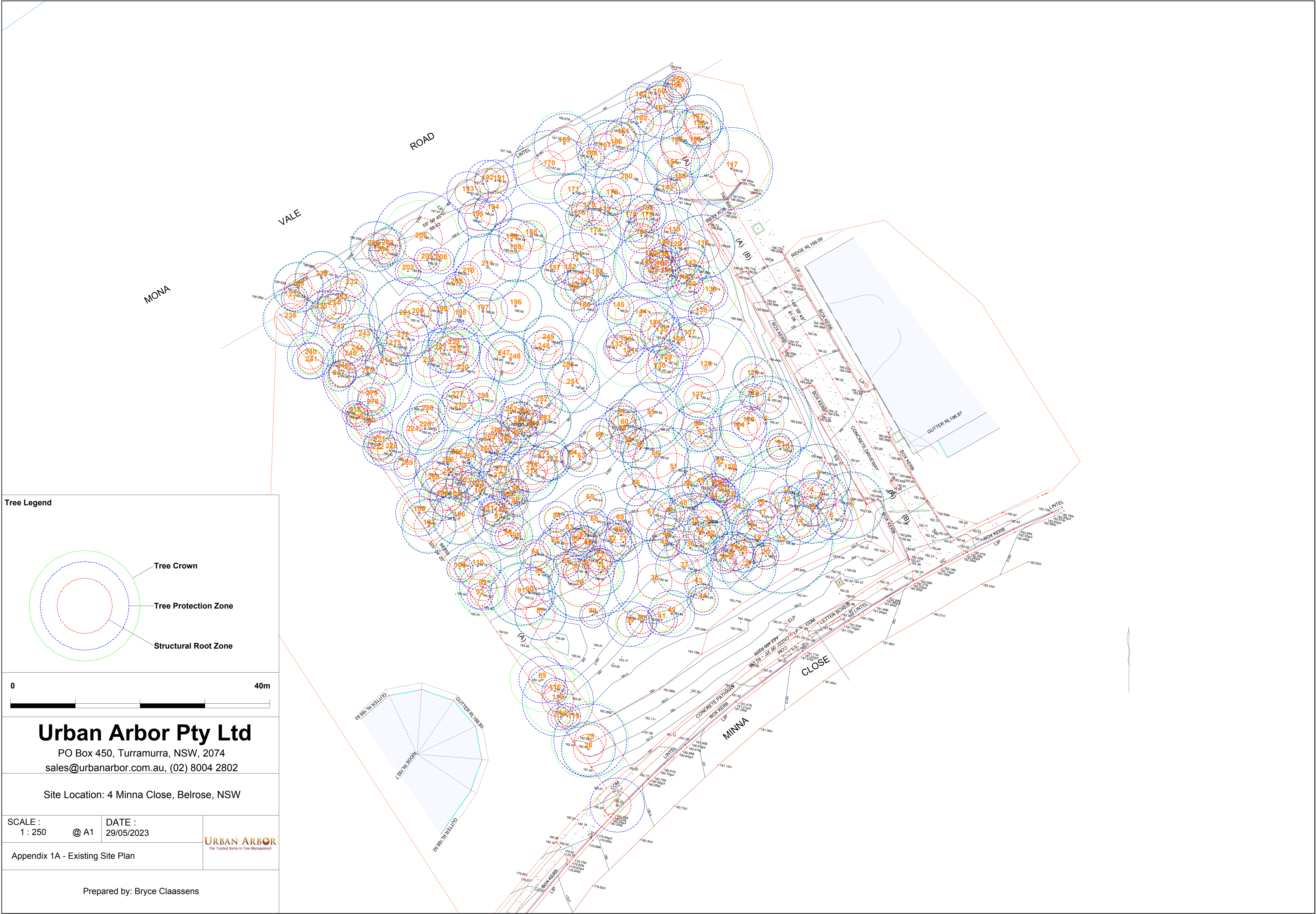
14. LIST OF APPENDICES

The following are included in the appendices:

- Appendix 1A: Existing Site Plan
- Appendix 1B: Proposed Site Plan
- Appendix 2: Tree Inspection Schedule
- Appendix 3: Further Information of Methodology



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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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Young	3	1	350					350	350	Good	Fair	Low	5. Small/Young	Z1	4.2	2.1	Street tree. Previously topped.
2	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	13	5	430					430	450	Good	Fair	High	2. Medium	A1	5.2	2.4	Co-dominant stems with tight union. Asymmetric crown shape.
3	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	15	5	420					420	500	Good	Good	High	1. Long	A1	5.0	2.5	None.
4	Smooth Barked Apple	<i>Angophora costata</i>	Young	10	2	160					160	190	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
5	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	16	4	350					350	410	Good	Fair	High	2. Medium	A1	4.2	2.3	Asymmetric crown shape.
6	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	12	4	220	150				266	400	Good	Fair	Medium	2. Medium	A1	3.2	2.3	Co-dominant stems from base. Asymmetric crown shape.
7	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	14	3	250					250	280	Good	Fair	Medium	2. Medium	A1	3.0	1.9	Asymmetric crown shape.
8	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Veteran	17	7	600					600	720	Good	Fair	Very High	3. Short	Z9	7.2	2.9	Central decay column spiralling up trunk, possible lighting damage. Large deadwood. Remaining crown appears healthy and stable.
9	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Young	10	2	160					160	170	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
10	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	12	2	260					260	300	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
11	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	17	7	620					620	670	Good	Good	Very High	1. Long	AA	7.4	2.8	Co-dominant stems with good form to union.
12	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	11	2	220					220	240	Good	Good	Medium	1. Long	A1	2.6	1.8	None.
13	Sydney Peppermint	<i>Eucalyptus piperita</i>	Mature	18	5	420					420	450	Good	Good	High	1. Long	A1	5.0	2.4	None.
14	Smooth Barked Apple	<i>Angophora costata</i>	Semi-mature	12	3	250					250	280	Good	Fair	Medium	2. Medium	A1	3.0	1.9	Co-dominant stems. Asymmetric crown. Suppressed form.
15	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Veteran	15	8	650					650	690	Good	Poor	Very High	4. Remove	Z5	7.8	2.8	Central decay column and large branch failure.
16	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	18	6	450					450	630	Good	Good	High	1. Long	A1	5.4	2.7	None.
17	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	10	3	200					200	240	Good	Fair	Medium	2. Medium	A1	2.4	1.8	Asymmetric crown shape.
18	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	15	3	240					240	320	Good	Good	Medium	1. Long	A1	2.9	2.1	Trunk wound with relatively good response growth adjacent to wound.
19	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	12	3	270					270	310	Good	Fair	Medium	2. Medium	A1	3.2	2.0	Asymmetric crown shape. Trunk wound with relatively good response growth adjacent to wound.
20	Red Bloodwood	<i>Corymbia gummifera</i>	Young	9	2	170					170	190	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	Asymmetric crown shape.
21	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Mature	15	4	300					300	360	Good	Good	High	1. Long	A1	3.6	2.2	None.
22	Red Bloodwood	<i>Corymbia gummifera</i>	Young	5	1	100					100	120	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
23	Red Bloodwood	<i>Corymbia gummifera</i>	Young	5	1	100					100	120	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
24	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Young	10	2	180					180	200	Good	Fair	Low	5. Small/Young	Z1	2.2	1.7	Trunk wound with relatively good response growth adjacent to wound.
25	Smooth Barked Apple	<i>Angophora costata</i>	Mature	16	6	280	380				472	490	Good	Good	High	1. Long	A1	5.7	2.5	Co-dominant stems with good form to union.
26	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	16	4	350					350	420	Good	Fair	High	1. Long	A1	4.2	2.3	Asymmetric crown shape.
27	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	14	4	210	290				358	400	Good	Fair	High	1. Long	A1	4.3	2.3	Asymmetric crown shape. Co-dominant stems.
28	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	3	250					250	280	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
29	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	15	3	250					250	280	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
30	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	14	4	310					310	360	Good	Fair	High	1. Long	A1	3.7	2.2	Asymmetric crown shape.
31	Red Bloodwood	<i>Corymbia gummifera</i>	Young	7	1	130					130	160	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
32	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	14	2	220					220	260	Good	Good	Medium	1. Long	A1	2.6	1.9	None.
33	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	16	3	270					270	310	Good	Good	Medium	1. Long	A1	3.2	2.0	None.
34	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	2	220					220	240	Good	Good	Medium	1. Long	A1	2.6	1.8	None.
35	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	16	4	400					400	450	Good	Fair	High	2. Medium	A1	4.8	2.4	Trunk wound with relatively good response growth adjacent to wound.
36	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	16	4	310					310	330	Good	Good	High	1. Long	A1	3.7	2.1	None.
37	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	18	4	370					370	450	Good	Good	High	1. Long	A1	4.4	2.4	None.
38	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	17	6	540					540	610	Good	Good	Very High	1. Long	AA	6.5	2.7	None.
39	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	290					290	310	Fair	Fair	Medium	3. Short	Z4	3.5	2.0	Apical dieback of West stem.

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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
40	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Semi-mature	5	4	200					200	240	Good	Fair	Medium	2. Medium	A2	2.4	1.8	Significant trunk lean and asymmetric crown shape. Tree 41 suspended in union of primary branches.
41	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	10	2	200					200	290	Good	Fair	Medium	3. Short	Z10	2.4	2.0	Partial failure at base. Trunk is resting on tree 40.
42	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	9	3	300					300	340	Good	Good	High	1. Long	A1	3.6	2.1	None.
43	Sydney Peppermint	<i>Eucalyptus piperita</i>	Young	11	2	180					180	220	Good	Good	Low	5. Small/Young	Z1	2.2	1.8	None.
44	Smooth Barked Apple	<i>Angophora costata</i>	Semi-mature	10	2	200					200	270	Good	Good	Medium	1. Long	A1	2.4	1.9	None.
45	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	9	2	200					200	280	Good	Good	Medium	1. Long	A1	2.4	1.9	None.
46	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	14	3	260					260	310	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
47	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	9	2	200					200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
48	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Young	6	2	130	130				184	240	Good	Fair	Low	5. Small/Young	Z1	2.2	1.8	Trunk wound. Deadwood.
49	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	12	2	240					240	280	Good	Fair	Medium	2. Medium	A1	2.9	1.9	Co-dominant stems with south stem dead.
50	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	3	260					260	320	Good	Good	Medium	1. Long	A1	3.1	2.1	None.
51	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	15	6	440	320				544	600	Good	Good	Very High	1. Long	AA	6.5	2.7	Co-dominant stems with tight union.
52	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	5	460					460	520	Good	Fair	High	2. Medium	A1	5.5	2.5	Open cavity on trunk from 1.5m to base. Relatively good response growth adjacent to wound.
53	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	2	200					200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
54	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	16	4	210	230				311	490	Good	Good	High	1. Long	A1	3.7	2.5	Co-dominant stems from base.
55	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	17	5	430					430	550	Good	Good	High	1. Long	A1	5.2	2.6	None.
56	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Veteran	8	5	300	300				424	1000	Good	Poor	Very High	4. Remove	Z5	5.1	3.3	Significant bushfire damage to trunk.
57	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	16	3	260					260	290	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
58	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	3	240					240	270	Good	Good	Medium	1. Long	A1	2.9	1.9	None.
59	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	15	3	300					300	360	Good	Good	High	1. Long	A1	3.6	2.2	None.
60	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	2	210					210	230	Good	Good	Medium	1. Long	A1	2.5	1.8	None.
61	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	10	2	200					200	230	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
62	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	13	2	260					260	290	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
63	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	13	2	230					230	260	Good	Fair	Medium	2. Medium	A1	2.8	1.9	Asymmetric crown shape and trunk lean.
64	Silvertop Ash	<i>Eucalyptus sieberi</i>	Young	13	2	160					160	220	Good	Fair	Low	5. Small/Young	Z1	2.0	1.8	Asymmetric crown shape and trunk lean.
65	Black She Oak	<i>Allocasuarina littoralis</i>	Semi-mature	10	2	200					200	250	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
66	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	3	250					250	300	Good	Good	Medium	1. Long	A1	3.0	2.0	None.
67	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	14	4	330					330	390	Good	Good	High	1. Long	A1	4.0	2.2	None.
68	Red Bloodwood	<i>Corymbia gummifera</i>	Young	10	2	180					180	200	Good	Good	Low	5. Small/Young	Z1	2.2	1.7	None.
69	Heath-leaved Banksia	<i>Banksia ericifolia</i>	Semi-mature	8	2	170					170	200	Good	Good	Low	5. Small/Young	Z1	2.0	1.7	None.
70	Red Bloodwood	<i>Corymbia gummifera</i>	Young	9	1	130					130	150	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
71	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	12	2	250					250	260	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
72	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Semi-mature	11	3	220	120				251	330	Good	Good	Medium	1. Long	A1	3.0	2.1	Small wound at base with good response growth.
73	Red Bloodwood	<i>Corymbia gummifera</i>	Young	8	1	170					170	200	Good	Good	Low	5. Small/Young	Z1	2.0	1.7	None.
74	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	10	2	200					200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
75	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	11	3	300					300	340	Good	Good	High	1. Long	A1	3.6	2.1	None.
76	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Veteran	9	6	700					700	1200	Good	Fair	Very High	2. Medium	A2	8.4	3.6	Bushfire damage to trunk with good response growth. Large diameter deadwood.
77	Red Bloodwood	<i>Corymbia gummifera</i>	Young	6	1.5	160					160	180	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
78	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Mature	12	5	370	160				403	850	Good	Good	High	1. Long	A1	4.8	3.1	Co-dominant stems.
79	Red Bloodwood	<i>Corymbia gummifera</i>	Young	7	2	160					160	180	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.

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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
80	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	9	2	200					200	210	Good	Fair	Medium	2. Medium	A1	2.4	1.7	Bulge on trunk.
81	Red Bloodwood	<i>Corymbia gummifera</i>	Young	10	2	170					170	180	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
82	Red Bloodwood	<i>Corymbia gummifera</i>	Young	9	2	180					180	200	Good	Good	Low	5. Small/Young	Z1	2.2	1.7	None.
83	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	11	3	250					250	310	Good	Good	Medium	1. Long	A1	3.0	2.0	None.
84	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	11	2	230					230	270	Good	Good	Medium	1. Long	A1	2.8	1.9	Co-dominant stems at 2.5m.
85	Smooth Barked Apple	<i>Angophora costata</i>	Semi-mature	10	2	200					200	250	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
86	Red Bloodwood	<i>Corymbia gummifera</i>	Young	9	1	160					160	180	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
87	Smooth Barked Apple	<i>Angophora costata</i>	Mature	14	4	330					330	400	Good	Good	High	1. Long	A1	4.0	2.3	None.
88	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	12	3	260					260	330	Good	Good	Medium	1. Long	A1	3.1	2.1	None.
89	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	11	5	300					300	350	Good	Good	High	1. Long	A1	3.6	2.1	None.
90	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	5	330					330	390	Good	Good	High	1. Long	A1	4.0	2.2	None.
91	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Mature	10	5	400					400	450	Good	Good	High	1. Long	A1	4.8	2.4	None.
92	Red Bloodwood	<i>Corymbia gummifera</i>	Young	3	3	120					120	150	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Trunk lean, in contact with fence. Whole canopy is in adjoining property.
93	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	13	4	300					300	360	Good	Good	High	1. Long	A1	3.6	2.2	None.
94	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Semi-mature	8	3	200					200	260	Good	Good	High	1. Long	A1	2.4	1.9	None.
95	Smooth Barked Apple	<i>Angophora costata</i>	Semi-mature	11	3	270					270	330	Good	Good	High	1. Long	A1	3.2	2.1	None.
96	Smooth Barked Apple	<i>Angophora costata</i>	Young	8	3	130					130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
97	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	12	5	300	130				327	500	Good	Good	High	1. Long	A1	3.9	2.5	Co-dominant stems from 0.3m.
98	Old Man Banksia	<i>Banksia serrata</i>	Young	5	1.5	140					140	210	Good	Good	Low	5. Small/Young	Z1	2.0	1.7	Trunk wound and borer damage..
99	Smooth Barked Apple	<i>Angophora costata</i>	Young	7	2	170					170	210	Good	Good	Low	5. Small/Young	Z1	2.0	1.7	None.
100	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	8	2	200					200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
101	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	11	3	280					280	330	Good	Good	High	1. Long	A1	3.4	2.1	None.
102	Red Bloodwood	<i>Corymbia gummifera</i>	Young	8	2	180					180	220	Good	Good	Low	5. Small/Young	Z1	2.2	1.8	None.
103	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	12	3	240					240	280	Good	Good	High	1. Long	A1	2.9	1.9	None.
104	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	11	3	250					250	290	Good	Good	Medium	1. Long	A1	3.0	2.0	None.
105	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	9	3	300					300	360	Good	Fair	High	2. Medium	A1	3.6	2.2	Abrupt curve in trunk at 4m. Appears phototropic only.
106	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	10	4	340					340	360	Good	Good	High	1. Long	A1	4.1	2.2	None.
107	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	9	4	350					350	420	Good	Good	High	1. Long	A1	4.2	2.3	Asymmetric crown shape.
108	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	10	4	100	170	100	210		305	550	Good	Good	High	1. Long	A1	3.7	2.6	Identified as 1 tree on survey. Three stems are E. sieberi and one stem is C. gummifera.
109	Red Bloodwood	<i>Corymbia gummifera</i>	Young	6	2	170					170	200	Good	Good	Low	5. Small/Young	Z1	2.0	1.7	None.
110	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	12	3	300					300	330	Good	Good	High	1. Long	A1	3.6	2.1	None.
111	Heath-leaved Banksia	<i>Banksia ericifolia</i>	Semi-mature	5	1.5	120					120	140	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
112	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	11	2	230					230	350	Good	Good	Medium	1. Long	A1	2.8	2.1	None.
113	Smooth Barked Apple	<i>Angophora costata</i>	Young	6	1	130					130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
114	Smooth Barked Apple	<i>Angophora costata</i>	Young	5	1	110					110	130	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape and trunk lean.
115	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	12	5	460					460	490	Good	Good	High	1. Long	A1	5.5	2.5	None.
116	Black She Oak	<i>Allocasuarina littoralis</i>	Young	5	2	150					150	190	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
117	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	6	530					530	640	Good	Good	Very High	1. Long	AA	6.4	2.7	The tree is located in the adjoining property.
118	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	5	410					410	530	Good	Good	High	1. Long	A1	4.9	2.5	None.
119	Red Bloodwood	<i>Corymbia gummifera</i>	Young	9	2	140					140	180	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	Suppressed.
120	Red Bloodwood	<i>Corymbia gummifera</i>	Young	10	2	140					140	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
121	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	13	3	260					260	290	Good	Fair	Medium	2. Medium	A1	3.1	2.0	Suppressed form.
122	Red Bloodwood	<i>Corymbia gummifera</i>	Young	10	2	150					150	200	Good	Fair	Low	5. Small/Young	Z1	2.0	1.7	Trunk wound from ground to 3m.

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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
123	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Semi-mature	9	5	220					220	250	Good	Fair	Medium	1. Long	A1	2.6	1.8	Trunk lean.
124	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	5	180	320				367	750	Good	Good	High	1. Long	A1	4.4	2.9	Two stems from base.
125	Smooth Barked Apple	<i>Angophora costata</i>	Young	7	1	90					90	100	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
126	Red Bloodwood	<i>Corymbia gummifera</i>	Young	10	2	160					160	170	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	Previous failure of central leader.
127	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Semi-mature	10	3	260	100				279	340	Good	Good	Medium	1. Long	A1	3.3	2.1	None.
128	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	14	7	650					650	780	Good	Good	Very High	1. Long	AA	7.8	3.0	None.
129	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	12	2	230					230	250	Good	Good	Medium	1. Long	A1	2.8	1.8	None.
130	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	13	3	300					300	330	Good	Good	High	1. Long	A1	3.6	2.1	None.
131	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Veteran	10	5	750					750	830	Good	Fair	Very High	3. Short	Z9	9.0	3.1	Significant bushfire damage to trunk.
132	Old Man Banksia	<i>Banksia serrata</i>	Semi-mature	5	2	150	40	30			158	220	Good	Good	Low	5. Small/Young	Z1	2.0	1.8	None.
133	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	2	250					250	290	Good	Good	Medium	1. Long	A1	3.0	2.0	None.
134	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	13	3	320					320	350	Good	Good	High	1. Long	A1	3.8	2.1	None.
135	Old Man Banksia	<i>Banksia serrata</i>	Mature	7	3	270					270	340	Good	Fair	High	2. Medium	A1	3.2	2.1	Large deadwood. Previous branch failure.
136	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	13	3	330					330	360	Good	Fair	High	2. Medium	A1	4.0	2.2	Multiple trunk wounds with relatively good response growth adjacent to wounds.
137	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	2	260					260	290	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
138	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Young	6	2	150					150	180	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
139	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Semi-mature	7	4	220					220	300	Good	Fair	Medium	2. Medium	A1	2.6	2.0	Asymmetric crown shape.
140	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	14	3	300					300	340	Good	Good	High	1. Long	A1	3.6	2.1	None.
141	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	6	3	200					200	260	Good	Good	Medium	1. Long	A1	2.4	1.9	None.
142	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	10	3	180	160				241	420	Good	Good	Medium	1. Long	A1	2.9	2.3	None.
143	Smooth Barked Apple	<i>Angophora costata</i>	Young	8	2	130					130	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
144	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	13	4	430					430	500	Good	Fair	High	3. Short	Z9	5.2	2.5	Large trunk wound with bushfire damage.
145	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	11	2	200					200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
146	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	15	5	250	350				430	600	Good	Fair	High	2. Medium	A1	5.2	2.7	Previous branch failures.
147	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	4	300					300	380	Good	Good	High	1. Long	A1	3.6	2.2	None.
148	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	6	540					540	650	Good	Good	Very High	1. Long	AA	6.5	2.8	Co-dominant stems with tight union. Union does not appear to be compromised.
149	NSW Christmas Bush	<i>Ceratopetalum gummiferum</i>	Young	8	1	100					100	120	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Suppressed form.
150	NSW Christmas Bush	<i>Ceratopetalum gummiferum</i>	Young	5	1	80					80	90	Good	Fair	Very Low	5. Small/Young	Z1	2.0	1.5	None.
151	NSW Christmas Bush	<i>Ceratopetalum gummiferum</i>	Young	5	1	80					80	90	Good	Fair	Very Low	5. Small/Young	Z1	2.0	1.5	None.
152	NSW Christmas Bush	<i>Ceratopetalum gummiferum</i>	Young	5	1	80					80	90	Good	Fair	Very Low	5. Small/Young	Z1	2.0	1.5	None.
153	NSW Christmas Bush	<i>Ceratopetalum gummiferum</i>	Semi-mature	7	1	140					140	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
154	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	4	360					360	420	Good	Good	High	1. Long	A1	4.3	2.3	None.
155	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	14	5	440					440	460	Good	Good	High	1. Long	A1	5.3	2.4	None.
156	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	14	3	280					280	320	Good	Good	Medium	1. Long	A1	3.4	2.1	The tree is located in the adjoining property.
157	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	14	4	330					330	360	Good	Fair	Medium	1. Long	A1	4.0	2.2	The tree is located in the adjoining property. Trunk lean.

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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
158	Smooth Barked Apple	<i>Angophora costata</i>	Young	8	2	170					170	190	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	The tree is located in the adjoining property. Asymmetric crown shape.
159	Smooth Barked Apple	<i>Angophora costata</i>	Young	8	2	170					170	190	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	The tree is located in the adjoining property. Asymmetric crown shape.
160	Red Bloodwood	<i>Corymbia gummifera</i>	Young	8	2	180					180	200	Good	Fair	Low	5. Small/Young	Z1	2.2	1.7	Asymmetric crown shape.
161	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	14	4	340					340	360	Good	Good	High	1. Long	A1	4.1	2.2	None.
162	Sydney Peppermint	<i>Eucalyptus piperita</i>	Semi-mature	8	2	200					200	220	Good	Fair	Medium	2. Medium	A1	2.4	1.8	Asymmetric crown shape and trunk lean.
163	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	14	2	260					260	290	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
164	Smooth Barked Apple	<i>Angophora costata</i>	Semi-mature	13	2	220					220	250	Good	Good	Medium	1. Long	A1	2.6	1.8	None.
165	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	5	440					440	520	Good	Good	High	1. Long	A1	5.3	2.5	Trunk lean.
166	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	12	4	280	160				322	400	Good	Good	High	1. Long	A1	3.9	2.3	None.
167	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	16	4	370					370	440	Good	Good	High	1. Long	A1	4.4	2.3	None.
168	Smooth Barked Apple	<i>Angophora costata</i>	Young	9	1	130					130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
169	Sydney Peppermint	<i>Eucalyptus piperita</i>	Mature	13	5	280	270				389	570	Good	Good	High	1. Long	A1	4.7	2.6	Co-dominant stems with tight union. Union does not appear to be compromised.
170	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	14	5	470					470	520	Good	Good	High	1. Long	A1	5.6	2.5	None.
171	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	15	3	250					250	280	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
172	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	15	3	250					250	280	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
173	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	13	3	220					220	300	Good	Good	Medium	1. Long	A1	2.6	2.0	None.
174	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	4	330					330	360	Good	Good	High	1. Long	A1	4.0	2.2	None.
175	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	12	3	220					220	280	Good	Good	Medium	1. Long	A1	2.6	1.9	None.
176	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Young	9	2	180					180	200	Good	Fair	Low	5. Small/Young	Z1	2.2	1.7	Co-dominant stems.
177	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	17	6	350					350	390	Good	Good	High	1. Long	A1	4.2	2.2	None.
178	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	17	3	300					300	330	Good	Good	High	1. Long	A1	3.6	2.1	None.
179	Red Bloodwood	<i>Corymbia gummifera</i>	Young	11	1	160					160	200	Good	Good	Low	5. Small/Young	Z1	2.0	1.7	None.
180	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	11	3	180	170				248	320	Fair	Fair	Medium	3. Short	Z4	3.0	2.1	Co-dominant stems with East stem dead.
181	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	2	220					220	260	Good	Good	Medium	1. Long	A1	2.6	1.9	None.
182	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	15	3	250					250	280	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
183	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	3	270					270	310	Good	Good	Medium	1. Long	A1	3.2	2.0	None.
184	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	14	3	260					260	300	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
185	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	4	380					380	410	Fair	Fair	High	3. Short	Z4	4.6	2.3	Apical and selective dieback. In decline.
186	Red Bloodwood	<i>Corymbia gummifera</i>	Young	12	2	180					180	200	Good	Good	Low	5. Small/Young	Z1	2.2	1.7	None.
187	Red Bloodwood	<i>Corymbia gummifera</i>	Young	9	2	140					140	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
188	Old Man Banksia	<i>Banksia serrata</i>	Dead	8	2	420					420	450	Dead	Poor	Medium	4. Remove	Z24	5.0	2.4	Dead stag. Possible ecological significance.
189	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	5	400					400	470	Good	Good	High	1. Long	A1	4.8	2.4	None.
190	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	8	2	280					280	300	Good	Fair	Medium	3. Short	Z9	3.4	2.0	Trunk wound with central decay column.
191	Sydney Peppermint	<i>Eucalyptus piperita</i>	Semi-mature	11	2	270					270	290	Good	Good	Medium	1. Long	A1	3.2	2.0	None.
192	Sydney Peppermint	<i>Eucalyptus piperita</i>	Semi-mature	11	2	270					270	290	Good	Good	Medium	1. Long	A1	3.2	2.0	None.
193	Sydney Peppermint	<i>Eucalyptus piperita</i>	Semi-mature	11	2	270					270	290	Good	Good	Medium	1. Long	A1	3.2	2.0	None.
194	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	11	3	90	140	180			245	450	Good	Fair	Medium	2. Medium	A1	2.9	2.4	None.
195	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	13	3	250					250	290	Good	Good	Medium	1. Long	A1	3.0	2.0	None.
196	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	15	4	340					340	400	Good	Good	High	1. Long	A1	4.1	2.3	None.
197	Old Man Banksia	<i>Banksia serrata</i>	Mature	7	3	320					320	360	Good	Good	High	1. Long	A1	3.8	2.2	None.
198	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	10	3	300					300	350	Poor	Fair	High	4. Remove	Z4	3.6	2.1	Advanced stages of decline
199	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	260					260	290	Good	Good	Medium	1. Long	A1	3.1	2.0	None.
200	Old Man Banksia	<i>Banksia serrata</i>	Veteran	6	2	280					280	350	Fair	Fair	High	3. Short	Z9	3.4	2.1	Trunk failure with epicormic growth.
201	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	16	6	510					510	560	Good	Good	Very High	1. Long	AA	6.1	2.6	None.

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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
202	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Young	10	1	160					160	180	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
203	Sydney Peppermint	<i>Eucalyptus piperita</i>	Semi-mature	11	3	230					230	260	Good	Good	Medium	1. Long	A1	2.8	1.9	Asymmetric crown shape and trunk lean towards road.
204	Sydney Peppermint	<i>Eucalyptus piperita</i>	Young	13	2	180					180	210	Good	Good	Low	5. Small/Young	Z1	2.2	1.7	None.
205	Sydney Peppermint	<i>Eucalyptus piperita</i>	Mature	13	4	320					320	350	Good	Good	High	1. Long	A1	3.8	2.1	None.
206	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	6	500	200	210	200		612	1000	Good	Good	Very High	1. Long	AA	7.3	3.3	Marked as one tree on survey, however there is two separate species. The largest stem is C. gummifera and the three smaller stems are E. sieberi.
207	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Young	8	1	140					140	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
208	NSW Christmas Bush	<i>Ceratopetalum gummiferum</i>	Semi-mature	9	1	110					110	130	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
209	Old Man Banksia	<i>Banksia serrata</i>	Young	6	1	130					130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
210	Old Man Banksia	<i>Banksia serrata</i>	Young	6	1	130					130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
211	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	13	5	330	280				433	600	Good	Fair	High	3. Short	Z9	5.2	2.7	Failure of West Co-dominant stem with evidence of decay on remaining East stem.
212	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	14	4	120	160	160	220		338	500	Good	Fair	High	2. Medium	A1	4.1	2.5	Co-dominant stems with tight unions.
213	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	12	2	210					210	220	Good	Good	Medium	1. Long	A1	2.5	1.8	None.
214	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	13	3	230	140				269	350	Good	Good	Medium	1. Long	A1	3.2	2.1	None.
215	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	15	6	580					580	740	Good	Good	Very High	1. Long	AA	7.0	2.9	Minor cavity at base with good response growth.
216	Old Man Banksia	<i>Banksia serrata</i>	Semi-mature	6	2	180					180	320	Good	Good	Medium	1. Long	A1	2.2	2.1	None.
217	Silvertop Ash	<i>Eucalyptus sieberi</i>	Young	9	2	190					190	210	Good	Fair	Low	3. Short	Z9	2.3	1.7	Cavity on trunk at 1-2m. Trunk lean and asymmetric crown shape.
218	Red Bloodwood	<i>Corymbia gummifera</i>	Young	11	1	140					140	170	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
219	NSW Christmas Bush	<i>Ceratopetalum gummiferum</i>	Semi-mature	9	1	150					150	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
220	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	3	300					300	330	Good	Good	High	1. Long	A1	3.6	2.1	None.
221	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	10	2	200					200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
222	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	10	2	220					220	250	Good	Good	Medium	1. Long	A1	2.6	1.8	Asymmetric crown shape.
223	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	250					250	280	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
224	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	3	310					310	350	Good	Good	High	1. Long	A1	3.7	2.1	None.
225	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	12	4	190	220				291	350	Good	Fair	Medium	3. Short	Z9	3.5	2.1	Significant decay at base.
226	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	14	2	230					230	250	Good	Good	Medium	1. Long	A1	2.8	1.8	None.
227	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	14	3	290					290	350	Good	Fair	Medium	2. Medium	A1	3.5	2.1	Decay at base with relatively good response growth adjacent to wound.
228	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	3	330					330	380	Good	Good	High	1. Long	A1	4.0	2.2	None.
229	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	16	3	330					330	380	Good	Good	High	1. Long	A1	4.0	2.2	None.
230	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	15	6	180	270	270			422	550	Good	Good	High	1. Long	A1	5.1	2.6	Three stems from base.
231	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	3	300					300	330	Good	Good	High	1. Long	A1	3.6	2.1	None.
232	Smooth Barked Apple	<i>Angophora costata</i>	Semi-mature	11	2	200					200	230	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
233	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	15	3	310					310	330	Good	Good	Medium	1. Long	A1	3.7	2.1	Asymmetric crown shape.
234	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	9	2	210					210	270	Good	Fair	Medium	3. Short	Z9	2.5	1.9	Significant trunk lean with decay at base of trunk on tension side.
235	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	10	2	230					230	250	Good	Good	Medium	1. Long	A1	2.8	1.8	None.
236	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	13	4	260	240				354	500	Good	Good	High	1. Long	A1	4.2	2.5	None.
237	Sydney Peppermint	<i>Eucalyptus piperita</i>	Young	9	2	170					170	190	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	Asymmetric crown shape.
238	Sydney Peppermint	<i>Eucalyptus piperita</i>	Mature	15	4	320					320	350	Good	Good	High	1. Long	A1	3.8	2.1	None.
239	Sydney Peppermint	<i>Eucalyptus piperita</i>	Mature	15	4	340					340	400	Good	Fair	High	2. Medium	A1	4.1	2.3	Kino ooze and irregular bulging on trunk, potential borer damage.

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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
240	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	3	300					300	330	Good	Good	High	1. Long	A1	3.6	2.1	None.
241	Old Man Banksia	<i>Banksia serrata</i>	Semi-mature	6	2	230					230	260	Good	Fair	Medium	2. Medium	A1	2.8	1.9	Located directly adjacent to the boundary fence. Multiple hollows on trunk.
242	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	17	5	470					470	550	Good	Good	High	1. Long	A1	5.6	2.6	None.
243	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	14	3	300					300	330	Good	Good	High	1. Long	A1	3.6	2.1	Trunk lean and asymmetric crown shape appears phototropic only.
244	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	16	4	330					330	360	Good	Good	High	1. Long	A1	4.0	2.2	None.
245	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	11	2	200					200	260	Good	Good	Medium	1. Long	A1	2.4	1.9	Asymmetric crown shape and trunk lean.
246	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	16	3	320					320	350	Good	Good	High	1. Long	A1	3.8	2.1	None.
247	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	18	4	230	220				318	480	Good	Good	High	1. Long	A1	3.8	2.4	Co-dominant stems with relatively good form to union.
248	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	3	250					250	280	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
249	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	15	4	320					320	360	Good	Good	High	1. Long	A1	3.8	2.2	None.
250	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	16	4	360					360	440	Good	Good	High	1. Long	A1	4.3	2.3	None.
251	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	15	4	350					350	380	Good	Good	High	1. Long	A1	4.2	2.2	Large diameter deadwood.
252	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	15	3	270					270	380	Good	Fair	Medium	2. Medium	A1	3.2	2.2	Cavity at base with bottle butt response growth.
253	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	16	4	340					340	390	Good	Good	High	1. Long	A1	4.1	2.2	None.
254	Old Man Banksia	<i>Banksia serrata</i>	Mature	8	3	290					290	330	Good	Good	High	1. Long	A1	3.5	2.1	None.
255	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Young	10	2	150					150	170	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
256	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	16	2	240					240	260	Good	Good	Medium	1. Long	A1	2.9	1.9	None.
257	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	11	2	200					200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
258	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	250					250	270	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
259	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	250					250	270	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
260	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	15	2	200					200	260	Good	Fair	Medium	2. Medium	A1	2.4	1.9	Wound at base with good response growth adjacent to wound.
261	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	250					250	270	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
262	Silvertop Ash	<i>Eucalyptus sieberi</i>	Semi-mature	16	3	270					270	330	Good	Good	High	1. Long	A1	3.2	2.1	Trunk lean with upright adjustment.
263	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	250					250	270	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
264	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	16	3	290					290	310	Good	Good	Medium	1. Long	A1	3.5	2.0	None.
265	Red Bloodwood	<i>Corymbia gummifera</i>	Young	10	2	190					190	210	Good	Good	Low	5. Small/Young	Z1	2.3	1.7	None.
266	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	17	5	430					430	480	Good	Good	High	1. Long	A1	5.2	2.4	Co-dominant stems with good form to union.
267	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	12	4	300					300	350	Good	Good	High	1. Long	A1	3.6	2.1	None.
268	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	2	250					250	270	Good	Good	Medium	1. Long	A1	3.0	1.9	None.
269	Silvertop Ash	<i>Eucalyptus sieberi</i>	Young	9	2	140					140	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
270	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	15	3	280					280	320	Good	Good	Medium	1. Long	A1	3.4	2.1	None.
271	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	17	4	320					320	350	Good	Good	High	1. Long	A1	3.8	2.1	None.
272	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Semi-mature	14	3	250					250	300	Good	Good	Medium	1. Long	A1	3.0	2.0	None.
273	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	17	4	340					340	380	Good	Good	High	1. Long	A1	4.1	2.2	None.
274	Silvertop Ash	<i>Eucalyptus sieberi</i>	Mature	15	4	300					300	470	Good	Fair	High	3. Short	Z9	3.6	2.4	Failure of stem at 1m leaving large wound.
275	Old Man Banksia	<i>Banksia serrata</i>	Semi-mature	6	2	230					230	250	Good	Good	Medium	1. Long	A1	2.8	1.8	Adjacent tree has failed and is resting in branch union.
276	Red Bloodwood	<i>Corymbia gummifera</i>	Dead	9	2	260					260	300	Dead	Poor	Medium	4. Remove	Z24	3.1	2.0	Dead tree.
277	Red Bloodwood	<i>Corymbia gummifera</i>	Semi-mature	15	1	200					200	220	Fair	Fair	Medium	3. Short	Z4	2.4	1.8	Apical dieback with epicormic growth.
278	Broad Leaved Scribbly Gum	<i>Eucalyptus haemastoma</i>	Young	8	2	180					180	220	Good	Good	Low	5. Small/Young	Z1	2.2	1.8	The tree has not been identified on the received plans.
279	Red Bloodwood	<i>Corymbia gummifera</i>	Mature	16	3	310					310	350	Good	Good	High	1. Long	A1	3.7	2.1	The tree has not been identified on the received plans.
280	Brown Stringy Bark	<i>Eucalyptus capitellata</i>	Mature	15	5	400					400	510	Good	Good	High	1. Long	A1	4.8	2.5	The tree has not been identified on the received plans.

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	Stem 5	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
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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) - $(DAB \times 50)^{0.42} \times 0.64$. 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.

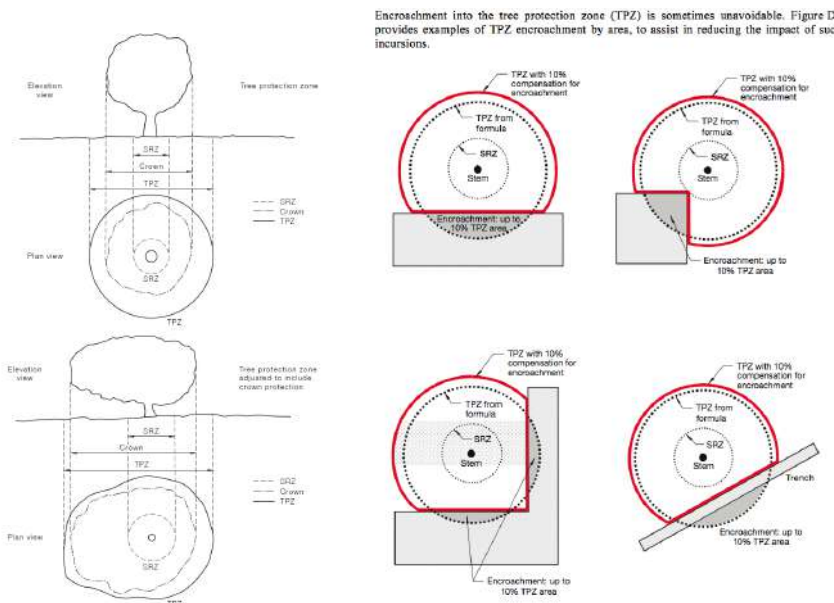
Retention Value: Tree AZ, see appendix 3 for categories.

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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • The tree is in above average health and condition and no remedial works are required.
Fair	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • The tree is in below average health and condition and may require remedial works to improve the trees health.
Poor	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • The tree is displaying low levels of health and removal or remedial works may be required.
Dead	<ul style="list-style-type: none"> • The tree is dead or almost dead. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • The tree is considered structurally good with well developed form.
Fair	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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