
Arboricultural Impact Assessment Report

Site location:

8-10 New McLean Street Edgecliff
NSW

Prepared for:

Mount St 4 Pty Ltd

Prepared by: Jack Williams and
Bryce Claassens

Date Prepared: 17 November 2023 -
Revision 4

Our Ref:

231117_8-10 New McLean_AIA_R4

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Report on trees at: 8-10 New McLean St, Edgecliff, NSW.

Prepared for: Mount St 4 Pty Ltd.

Prepared by: Jack Williams and Bryce Claassens, Urban Arbor, jack@urbanarbor.com.au, (02) 8004 2802.

Date: 17 November 2023 - Revision 4.

1. INTRODUCTION

- 1.1 Urban Arbor have been instructed by Mount St 4 Pty Ltd to inspect significant trees within the site and provide an Arboricultural Impact Assessment Report in relation to a development.
- 1.2 Below is a list of all documents and information provided to assist in preparing this report;
- A) Detail and Level Survey, Norton Partners, Draft Only.
 - B) Architectural Drawings, FJMT Studio, 25 July 2023.
 - C) Services Infrastructure Report, Stantec Australia Pty Ltd, 27 July 2023.
 - D) Additional Information for Services Relocation, Angus Nguyen (Landmark Group), No date or reference - Included in appendix 4.
- 1.3 The site and tree inspections were carried out on 24 and 27 February 2023. Access was available to the subject site and adjoining public areas only.
- 1.4 Record of report revisions;

Revision	Date	Report Reference
N/A	27/4/23	230427_8-10 New McLean_AIA
1	29/6/23	230629_8-10 New McLean_AIA_R1
2	19/7/23	230719_8-10 New McLean_AIA_R2
3	27/7/23	230727_8-10 New McLean_AIA_R3
4	17/11/23	231117_8-10 New McLean_AIA_R4

2. SCOPE OF THE REPORT

- 2.1 This report has been undertaken to meet the following objectives.
- 2.1.1 Conduct a ground level visual assessment of all significant trees located within 5 metres of development works. For the purpose of this report, a significant tree is a tree with a height equal to or greater than 4 metres.
 - 2.1.2 Determine the trees estimated contribution years and remaining useful life expectancy and award the trees a retention value.
 - 2.1.3 Provide an assessment of the potential impact the proposed development is likely to cause to the condition of the subject trees in accordance with AS4970 Protection of trees on development sites (2009).
 - 2.1.4 Specify tree protection measures in accordance with AS4970-2009 for any tree to be retained during the development.

3. LIMITATIONS

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

4. METHODOLOGY

- 4.1 The following information was collected during the assessment of the subject tree(s).
- 4.1.1 Tree common name
 - 4.1.2 Tree botanical name
 - 4.1.3 Tree age class
 - 4.1.4 DBH (Trunk/Stem diameter at breast height/1.4m) - millimetres.
 - 4.1.5 Estimated height - metres
 - 4.1.6 Estimated crown spread (radius of crown) - metres
 - 4.1.7 Health
 - 4.1.8 Structural condition
 - 4.1.9 Amenity value
 - 4.1.10 Estimated remaining contribution years (SULE)¹
 - 4.1.11 Retention value (Tree AZ)²
 - 4.1.12 Notes/comments
- 4.2 All trees located within the site and the adjoining park have been physically marked with plastic tree identification tags with the tree number and 'Urban Arbor' written on the tag. Trees located in adjoining sites have not been tagged. There are also some trees located within internal courtyards within the site that have not been tagged due to restricted access at the time of inspection.
- 4.3 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer, 1994).³
- 4.4 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.
- 4.5 All information was imported into (GIS) PT-mapper pro software. This software was used to measure/calculate all encroachment estimates included in this report.
- 4.6 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
- 4.7 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 OF DEVELOPMENT WORKS

- 5.1 The site is located in the Woollahra Council area, all trees at the site are subject to protection under the Woollahra Local Environmental Plan (LEP) 2014⁵ and Development Control Plan (DCP) 2015.⁶ The site is located inside a Heritage Conservation Area (C8) but is not identified as a heritage item in the LEP heritage maps.⁷
- 5.2 The development works assessed in this report include the demolition of the existing structures and construction of a multi storey complex, including multi-level basement.

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.

⁵ Woollahra Local Environmental Plan 2014, <http://www.legislation.nsw.gov.au/#/view/EPL/2015/20>, accessed 24 April 2023.

⁶ Woollahra Development Control Plan 2015, http://www.woollahra.nsw.gov.au/building_and_development/development_rules, accessed 24 April 2023.

⁷ Woollahra LEP Heritage map - Sheet HER_003A, <https://www.legislation.nsw.gov.au/view/pdf/map/6bd60376-3ced-479a-aac7-4a239086c716>, accessed 24 April 2023.

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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.

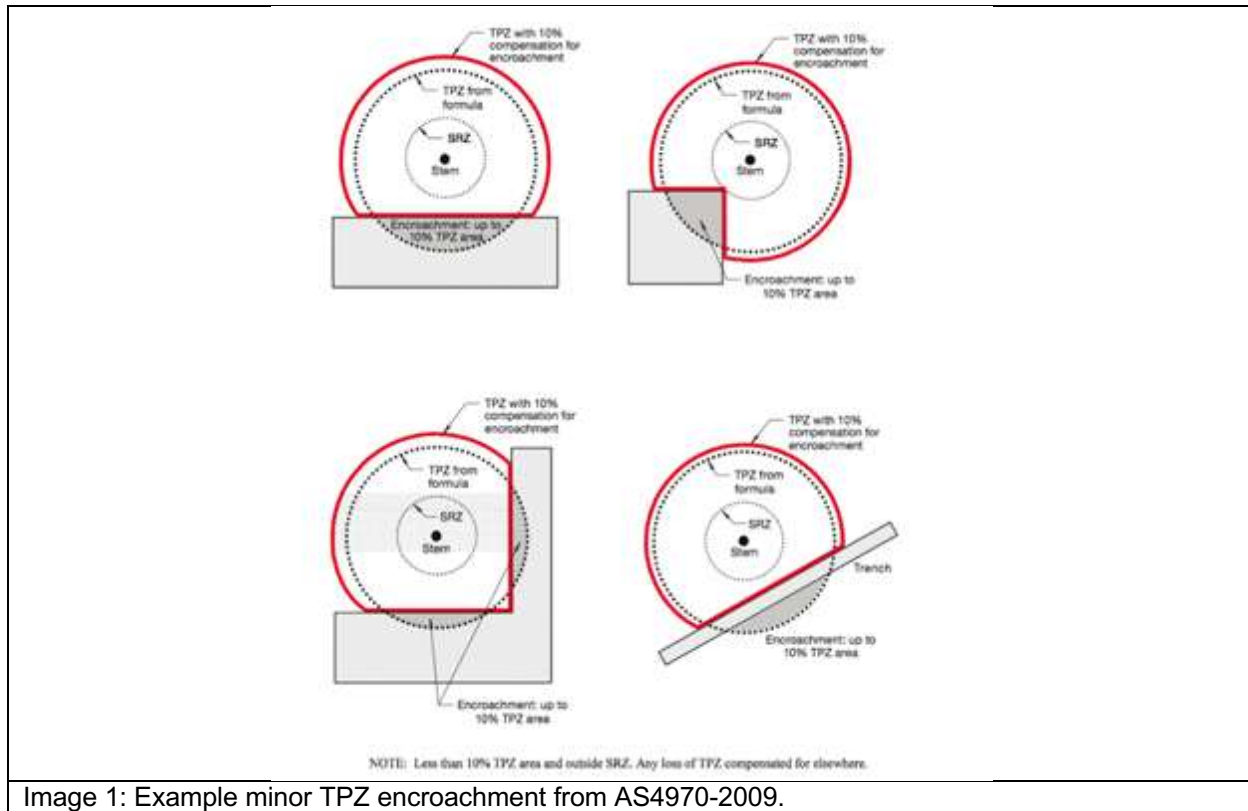


Image 1: Example minor TPZ encroachment from AS4970-2009.

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 three 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 ground floor plan
- Appendix 1C: Proposed basement

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 the proposed concept building and basement only. No bulk earthworks or services have been assessed in this report. The proposed landscaping (footpaths and terrace adjacent to the New McLean Street) have not been included in the TPZ encroachment calculation below. See section 9.2 for guidance in relation to tree sensitive landscaping construction in the TPZ of trees to be retained.

Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	<i>Syagrus romanzoffiana</i>	Z3	2.5	19.6	N/A	None	No encroachment into the TPZ.	Retain and protect
2	<i>Schefflera spp</i>	Z9	7.7	186.3	2.9	None	No encroachment into the TPZ.	Retain and protect
3	<i>Murraya paniculata</i>	Z1	2.3	16.6	1.6	None	No encroachment into the TPZ.	Retain and protect
4	<i>Syagrus romanzoffiana</i>	Z3	3.0	28.3	N/A	None	No encroachment into the TPZ.	Retain and protect
5	<i>Syagrus romanzoffiana</i>	Z3	2.5	19.6	N/A	None	No encroachment into the TPZ.	Retain and protect
6	<i>Lophostemon confertus</i>	A1	3.0	28.3	1.9	None	No encroachment into the TPZ.	Retain and protect
7	<i>Murraya paniculata</i>	Z1	2.0	12.6	1.5	None	No encroachment into the TPZ.	Retain and protect
8	<i>Murraya paniculata</i>	Z1	2.0	12.6	1.6	None	No encroachment into the TPZ.	Retain and protect
9	<i>Howea forsteriana</i>	Z1	2.5	19.6	N/A	Major	The building at ground floor and upper levels will be located less than 1m from the trunk and will encroach into the TPZ by 19% (3.8m ²), which is major TPZ encroachment and indicates condition will potentially be impacted due to combined root and canopy impacts.	Remove
10	<i>Robinia pseudoacacia</i>	A1	4.9	75.4	2.4	Major	The building at ground floor and upper levels will be located less than 1m from the trunk and will encroach into the TPZ by 37% (28.1m ²) and into the SRZ, which is	Remove

Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
							major TPZ encroachment and indicates that the stability and/or condition due to combined root and canopy impacts.	
11	<i>Robinia pseudoacacia</i>	A1	4.0	50.3	2.2	None	The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
12	<i>Robinia pseudoacacia</i>	A1	4.7	69.4	2.4	None	No encroachment into the TPZ.	Retain and protect
13	<i>Robinia pseudoacacia</i>	Z10	3.0	28.3	2.0	None	The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
14	<i>Howea forsteriana</i>	Z1	2.5	19.6	N/A	None	No encroachment into the TPZ.	Retain and protect
15	<i>Robinia pseudoacacia</i>	Z10	3.3	34.2	1.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
16	<i>Howea forsteriana</i>	Z1	2.0	12.6	N/A	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
17	<i>Robinia pseudoacacia</i>	A1	4.1	52.8	2.3	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
18	<i>Melaleuca quinquenervia</i>	A1	3.7	43.0	2.2	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
19	<i>Persea americana</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
20	<i>Melaleuca quinquenervia</i>	A1	4.2	55.4	2.3	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
21	<i>Melaleuca quinquenervia</i>	A1	4.8	72.4	2.4	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
22	<i>Magnolia grandiflora</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
23	<i>Backhousia citriodora</i>	Z1	2.0	12.6	1.6	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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24	<i>Eriobotrya japonica</i>	Z1	2.9	26.4	1.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
25	<i>Syzygium smithii</i>	Z1	2.0	12.6	1.5	Major	The trunk is located less than 0.5m from the proposed building/basement. The building/basement encroaches into the TPZ by more than 35% and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted.	Remove
26	<i>Syzygium smithii</i>	Z1	2.0	12.6	1.6	Major	The basement/building encroaches into the TPZ by 13% (1.7m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted.	Remove
27	<i>Agonis flexuosa</i>	A1	8.2	211.2	2.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
28	<i>Syagrus romanzoffiana</i>	Z3	3.0	28.3	N/A	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
29	<i>Syzygium paniculatum</i>	Z1	2.6	21.2	1.8	None	No encroachment into the TPZ.	Retain and protect
30	<i>Syagrus romanzoffiana</i>	Z3	3.0	28.3	N/A	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
31	<i>Stenocarpus sinuatus</i>	Z1	2.0	12.6	1.5	None	An elevated footpath is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
32	<i>Brachychiton acerifolius</i>	Z1	2.0	12.6	1.6	None	No encroachment into the TPZ.	Retain and protect
33	<i>Melaleuca quinquenervia</i>	A1	4.8	72.4	2.4	Major	The trunk is located less than 1m from the proposed building/basement. The building/basement encroaches into the TPZ by more than 35% and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted.	Remove
34	<i>Agonis flexuosa</i>	A1	4.3	58.1	2.4	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
35	<i>Corymbia maculata</i>	AA 1	5.6	98.5	2.6	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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36	<i>Elaeocarpus reticulatus</i>	Z10	2.2	15.2	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
37	<i>Robinia pseudoacacia</i>	A1	4.2	55.4	2.3	None	No encroachment into the TPZ.	Retain and protect
38	<i>Casuarina glauca</i>	A1	4.4	60.8	2.3	None	No encroachment into the TPZ.	Retain and protect
39	<i>Casuarina glauca</i>	A1	5.8	105.7	2.6	None	No encroachment into the TPZ.	Retain and protect
40	<i>Casuarina glauca</i>	A1	3.8	45.4	2.2	None	No encroachment into the TPZ.	Retain and protect
41	<i>Casuarina glauca</i>	A1	4.1	52.8	2.2	None	No encroachment into the TPZ.	Retain and protect
42	<i>Casuarina glauca</i>	AA 1	6.5	132.7	2.7	Minor	The proposed building/basement encroaches into the TPZ by 10% (13.7m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
43	<i>Tristaniopsis laurina</i>	Z1	2.4	18.1	1.9	Minor	The basement/building encroaches into the TPZ by less than 10% but not into the SRZ. This is small/young tree located in close proximity to the proposed basement that is likely to be impacted during construction works.	Remove
44	<i>Banksia integrifolia</i>	ZZ 4	2.0	12.6	1.6	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
45	<i>Elaeocarpus reticulatus</i>	Z4	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
46	<i>Schefflera actinophylla</i>	Z3	4.0	50.3	2.0	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
47	<i>Melaleuca quinquenervia</i>	Z4	2.9	26.4	1.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
48	<i>Banksia integrifolia</i>	A2	3.3	34.2	2.0	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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49	<i>Melaleuca quinquenervia</i>	Z1	2.4	18.1	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
50	<i>Banksia integrifolia</i>	Z1	2.0	12.6	1.6	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
51	<i>Melaleuca quinquenervia</i>	A1	3.6	40.7	2.1	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
52	<i>Eucalyptus botryoides</i>	AA 2	7.0	153.9	2.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
53	<i>Eucalyptus microcorys</i>	A2	4.3	58.1	2.3	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
54	<i>Corymbia maculata</i>	A1	2.8	24.6	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
55	<i>Eucalyptus pilularis</i>	AA 1	5.8	105.7	2.6	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
56	<i>Jacaranda mimosifolia</i>	A1	3.8	45.4	1.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
57	<i>Eucalyptus robusta</i>	Z4	2.0	12.6	1.7	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
58	<i>Melaleuca quinquenervia</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
59	<i>Archontophoeni</i> x <i>cunninghamiana</i>	Z1	2.0	12.6	N/A	None	No encroachment into the TPZ.	Retain and protect
60	<i>Celtis sinensis</i>	Z3	2.8	24.6	1.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
61	<i>Murraya paniculata</i>	Z1	4.8	72.4	2.4	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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62	X <i>Cupressocypariss leylandii</i>	Z3	4.2	55.4	2.3	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
63	X <i>Cupressocypariss leylandii</i>	Z3	4.8	72.4	2.4	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
63a	<i>Murraya paniculata</i>	Z1	2.4	18.1	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
64	<i>Eucalyptus pilularis</i>	Z4	3.7	43.0	2.2	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
65	<i>Agonis flexuosa</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
66	<i>Olea europaea subsp. cuspidata</i>	Z3	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
67	<i>Glochidion ferdinandi</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
68	<i>Glochidion ferdinandi</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
69	<i>Celtis sinensis</i>	Z3	2.0	12.6	1.7	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
70	<i>Celtis sinensis</i>	Z3	3.4	36.3	2.1	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
71	<i>Strelitzia nicolai</i>	Z3	3.0	28.3	N/A	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
72	<i>Casuarina cunninghamiana</i>	A2	5.5	95.0	2.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

Report on trees at: 8-10 New McLean St, Edgecliff, NSW.

Prepared for: Mount St 4 Pty Ltd.

Prepared by: Jack Williams and Bryce Claassens, Urban Arbor, jack@urbanarbor.com.au, (02) 8004 2802.

Date: 17 November 2023 - Revision 4.

Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
73	<i>Ulmus parviflora</i>	A1	3.4	36.3	2.0	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
74	<i>Corymbia maculata</i>	Z1	2.0	12.6	1.6	Major	The trunk is located less than 1m from the proposed building/basement. The building/basement encroaches into the TPZ by more than 35% and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted.	Remove
75	<i>Ulmus parviflora</i>	A1	3.2	32.2	2.0	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
76	Dead Tree	ZZ 4	2.9	26.4	2.0	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
77	<i>Eucalyptus globulus</i>	A2	9.7	295.6	3.3	Minor	The proposed building/basement encroaches into the TPZ by 6% (17.5m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
78	<i>Syzygium paniculatum</i>	Z1	2.0	12.6	1.5	None	The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
79	<i>Casuarina glauca</i>	A1	3.4	36.3	2.0	None	The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
80	<i>Lagerstroemia indica</i>	Z1	2.2	15.2	2.2	None	The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
81	<i>Eucalyptus saligna</i>	AA 2	8.0	201.1	2.9	Minor	The proposed building/basement encroaches into the TPZ by 7% (14.4m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect

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82	<i>Eucalyptus saligna</i>	Z10	4.1	52.8	2.2	Minor	The proposed building/basement encroaches into the TPZ by 2% (1.3m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
83	Dead Tree	ZZ 4	5.8	105.7	2.6	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
84	<i>Casuarina glauca</i>	A1	4.9	75.4	2.4	Major	The basement/building encroaches into the TPZ by 28% (20.9m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted.	Remove
85	<i>Casuarina glauca</i>	Z1	2.0	12.6	1.5	Major	The trunk is located less than 1m from the proposed building/basement. The building/basement encroaches into the TPZ by more than 35% and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted.	Remove
86	<i>Casuarina glauca</i>	A1	4.3	58.1	2.3	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
87	<i>Casuarina glauca</i>	Z9	3.6	40.7	2.0	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
88	<i>Casuarina glauca</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
89	<i>Casuarina glauca</i>	A1	3.8	45.4	2.2	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
90	<i>Casuarina glauca</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
91	<i>Casuarina glauca</i>	A1	5.3	88.2	2.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
92	<i>Casuarina glauca</i>	AA 1	7.1	158.4	2.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
93	<i>Eucalyptus microcorys</i>	A1	2.8	24.6	1.9	Minor	No encroachment from the proposed building/basement at ground level. The upper levels of the proposed building and terrace at ground level encroaches into the TPZ by less than 5% (<1m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
94	<i>Callistemon viminalis</i>	Z1	2.0	12.6	1.8	Major	No encroachment from the proposed building/basement at ground level. The upper levels of the proposed building and terrace at ground level encroach into the TPZ by 28% (3.5m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted. Excessive canopy pruning is likely to be required to accommodate the building.	Remove
95	<i>Callistemon viminalis</i>	Z1	2.0	12.6	1.7	Footprint	The trunk is located within the footprint of the proposed building.	Remove
96	<i>Callistemon viminalis</i>	Z1	2.0	12.6	1.8	None	The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
97	<i>Callistemon viminalis</i>	Z1	2.6	21.2	2.0	Minor	No encroachment from the proposed building/basement at ground level. The upper levels of the proposed building and terrace at ground level encroaches into the TPZ by less than 5% (<1m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. The proposed terrace/deck between the building and New McLean Street is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
98	<i>Ulmus parviflora</i>	A1	2.8	24.6	1.9	Major	The basement and building encroach into the TPZ by 28% (3.5m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted. Excessive canopy pruning is likely to be required to accommodate the building.	Remove
99	<i>Casuarina cunninghamiana</i>	A1	4.6	66.5	2.4	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
100	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
101	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.6	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
102	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
103	<i>Casuarina glauca</i>	A1	4.6	66.5	2.3	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
104	<i>Casuarina glauca</i>	A1	4.9	75.4	2.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
105	<i>Casuarina glauca</i>	A1	4.9	75.4	2.4	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
106	<i>Casuarina glauca</i>	Z10	2.5	19.6	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
107	<i>Casuarina glauca</i>	A1	4.3	58.1	2.3	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
108	<i>Casuarina glauca</i>	A1	4.1	52.8	2.2	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
109	<i>Casuarina glauca</i>	Z10	3.1	30.2	2.1	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
110	<i>Casuarina glauca</i>	Z10	2.8	24.6	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
111	<i>Casuarina glauca</i>	A1	3.2	32.2	2.1	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
112	<i>Casuarina glauca</i>	A1	3.6	40.7	2.1	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
113	<i>Casuarina glauca</i>	A1	6.2	120.8	2.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
114	<i>Callistemon viminalis</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
115	<i>Melaleuca bracteata</i>	Z10	3.2	32.2	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
116	<i>Melaleuca bracteata</i>	A1	2.3	16.6	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
117	<i>Melaleuca bracteata</i>	A1	2.5	19.6	1.9	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
118	<i>Melaleuca bracteata</i>	A1	2.2	15.2	1.7	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
119	<i>Melaleuca bracteata</i>	A1	3.3	34.2	2.0	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
120	<i>Melaleuca bracteata</i>	Z10	2.2	15.2	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
121	<i>Melaleuca bracteata</i>	A1	2.4	18.1	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
122	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
123	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
124	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
125	<i>Callistemon viminalis</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
126	<i>Melaleuca bracteata</i>	Z10	2.0	12.6	1.7	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
127	<i>Melaleuca bracteata</i>	Z10	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
128	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
129	<i>Schefflera actinophylla</i>	Z3	2.5	19.6	1.9	Footprint	The trunk is located within the footprint of a proposed footpath. The trunk is located in close proximity to an existing retaining wall and tree is likely to be impacted by the demolition of the wall.	Remove
130	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
131	<i>Melaleuca bracteata</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building.	Remove
132	<i>Eucalyptus crebra</i>	AA 2	5.2	84.9	2.6	Minor	The proposed building encroaches into the TPZ by 4% (3.7m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. An elevated footpath is also proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
133	<i>Eucalyptus crebra</i>	AA 1	4.9	75.4	2.4	Minor	The proposed building encroaches into the TPZ by 5% (3.9m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted. An elevated footpath is also proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
134	<i>Eucalyptus crebra</i>	AA 1	4.7	69.4	2.4	Major	The basement/building encroach into the TPZ by 16% (10.8m ²) but not into the SRZ, which is major TPZ encroachment. However, there is an existing retaining wall located between the trunk and proposed building/basement, the tree will therefore not be significantly impacted. An elevated footpath is also proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
135	<i>Syzygium spp</i>	Z4	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
136	<i>Syzygium spp</i>	A1	2.5	19.6	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
137	<i>Syzygium spp</i>	Z10	2.3	16.6	1.7	Footprint	The trunk is located within the footprint of the proposed terrace area.	Remove

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138	<i>Syzygium spp</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed terrace area.	Remove
139	<i>Syzygium spp</i>	Z1	2.0	12.6	1.5	Footprint	The trunk is located within the footprint of the proposed terrace area.	Remove
140	<i>Jacaranda mimosifolia</i>	Z11	4.4	60.8	2.2	None	An elevated footpath is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
141	<i>Celtis sinensis</i>	Z3	2.0	12.6	1.5	None	No encroachment into the TPZ.	Retain and protect
142	<i>Olea europaea subsp. cuspidata</i>	Z3	4.0	50.3	2.0	None	An elevated footpath is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
143	<i>Eucalyptus saligna</i>	A2	3.5	38.5	2.1	None	An elevated footpath is also proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
144	<i>Morus nigra</i>	Z4	4.9	75.4	2.4	Minor	The proposed terrace area encroaches into the TPZ by 9% (6.7m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
145	<i>Callistemon viminalis</i>	Z1	2.2	15.2	1.8	Footprint	The trunk is located within the footprint of the proposed building/basement.	Remove
146	<i>Callistemon viminalis</i>	Z1	2.4	18.1	1.8	Footprint	The trunk is located within the footprint of the proposed basement ramp.	Remove
147	<i>Melaleuca bracteata</i>	A1	3.1	30.2	1.8	Footprint	The trunk is located within the footprint of the proposed basement ramp.	Remove
148	<i>Melaleuca bracteata</i>	A1	2.6	21.2	1.7	Footprint	The trunk is located within the footprint of the proposed basement ramp.	Remove
149	<i>Callistemon viminalis</i>	A1	3.3	34.2	2.1	Major	The trunk is located less than 1m from the proposed basement ramp.	Remove
150	<i>Melaleuca bracteata</i>	A1	3.1	30.2	1.8	Minor	The proposed deck encroaches into the TPZ by 7% (17.6m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect

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151	<i>Melaleuca bracteata</i>	A1	3.4	36.3	2.0	None	No encroachment into the TPZ.	Retain and protect
152	<i>Casuarina cunninghamiana</i>	AA 1	8.6	232.4	3.0	Major	The proposed deck encroaches into the TPZ by 17% (39.5m ²) but not into the SRZ, which is major TPZ encroachment. However, there is an existing retaining wall/garage in the SRZ restricting root growth into the area of the TPZ encroachment, the tree will therefore not be impacted.	Retain and protect
153	<i>Melaleuca bracteata</i>	Z10	2.6	21.2	2.0	None	No encroachment into the TPZ.	Retain and protect
154	<i>Melaleuca bracteata</i>	Z10	2.2	15.2	1.7	None	No encroachment into the TPZ.	Retain and protect
158	<i>Melaleuca bracteata</i>	Z10	2.0	12.6	1.7	None	No encroachment into the TPZ.	Retain and protect
155	<i>Celtis sinensis</i>	Z3	4.1	52.8	2.2	None	No encroachment into the TPZ.	Retain and protect
156	<i>Melaleuca bracteata</i>	Z10	2.5	19.6	1.8	None	No encroachment into the TPZ.	Retain and protect
157	<i>Melaleuca bracteata</i>	Z10	3.1	30.2	2.0	None	No encroachment into the TPZ.	Retain and protect
159	<i>Washingtonia robusta</i>	A1	2.5	19.6	N/A	None	No encroachment into the TPZ.	Retain and protect
160	<i>Phoenix canariensis</i>	A2	2.5	19.6	N/A	None	No encroachment into the TPZ.	Retain and protect
161	<i>Brachychiton acerifolius</i>	A2	4.4	60.8	2.3	None	No encroachment into the TPZ.	Retain and protect
162	<i>Robinia pseudoacacia</i>	Z4	5.9	109.4	2.6	Minor	A proposed terrace at ground level and the upper levels of the proposed building will encroach into the TPZ by 10% (10m ²) but not into the SRZ, which is minor TPZ encroachment. At the time of inspection the tree was displaying declining	Remove

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							health, indicating that it will not be suitable for retention in close proximity to the proposed development works.	
163	<i>Robinia pseudoacacia</i>	Z10	3.8	45.4	2.2	Major	A proposed terrace at ground level and the upper levels of the proposed building will encroach into the TPZ by 29% (9.4m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted. The tree also leans significantly towards the building and will require excessive canopy pruning.	Remove
164	<i>Brachychiton acerifolius</i>	A1	2.9	26.4	1.9	Major	The propose building and basement will encroach into the TPZ by 17% (4.4m ²) and into the SRZ, which is major TPZ encroachment and indicates that the stability and/or condition will potentially be impacted.	Remove
165	<i>Phoenix canariensis</i>	A1	4.0	50.3	N/A	Major	The proposed building/basement is located less than 1 metre from the trunk and encroaches into the TPZ by 11% (5.5m ²), which is major TPZ encroachment and indicates that the tree will potentially be impacted. Significant canopy will also be required to accommodate the building and scaffolding. It may also be possible to transplant this tree to another area of the site.	Remove or transplant
166	<i>Brachychiton acerifolius</i>	A1	3.7	43.0	2.2	None	No proposed encroachment into the TPZ.	Retain and protect
167	<i>Leptospermum petersonii</i>	Z10	2.0	12.6	1.6	None	No proposed encroachment into the TPZ.	Retain and protect
168	<i>Ulmus spp</i>	A1	5.2	84.9	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
169	<i>Robinia pseudoacacia</i>	A1	5.8	105.7	2.8	None	No proposed encroachment into the TPZ.	Retain and protect
170	<i>Ficus rubiginosa</i>	Z11	3.7	43.0	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
171	<i>Robinia pseudoacacia</i>	Z5	5.3	88.2	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
172	<i>Celtis sinensis</i>	Z3	2.0	12.6	1.6	None	No proposed encroachment into the TPZ.	Retain and protect

Report on trees at: 8-10 New McLean St, Edgecliff, NSW.

Prepared for: Mount St 4 Pty Ltd.

Prepared by: Jack Williams and Bryce Claassens, Urban Arbor, jack@urbanarbor.com.au, (02) 8004 2802.

Date: 17 November 2023 - Revision 4.

Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
173	<i>Dead Tree</i>	ZZ 4	2.3	16.6	1.8	None	No proposed encroachment into the TPZ. The tree is dead.	Remove
174	<i>Grevillea robusta</i>	A1	4.0	50.3	2.2	None	No proposed encroachment into the TPZ.	Retain and protect
175	<i>Eucalyptus spp</i>	A1	3.8	45.4	2.2	None	No proposed encroachment into the TPZ.	Retain and protect
176	<i>Eucalyptus punctata</i>	A1	3.2	32.2	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
177	<i>Ficus macrophylla</i>	AA 4	15. 0	706.9	6.0	None	An elevated footpath is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
178	<i>Unknown spp</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
179	<i>Eucalyptus punctata</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
180	<i>Eucalyptus punctata</i>	A1	3.6	40.7	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
181	<i>Robinia pseudoacacia</i>	Z10	3.5	38.5	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
182	<i>Eucalyptus punctata</i>	A2	6.4	128.7	2.7	None	An elevated footpath is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
183	<i>Eucalyptus punctata</i>	A2	4.9	75.4	2.4	None	No proposed encroachment into the TPZ.	Retain and protect
184	<i>Eucalyptus punctata</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
185	<i>Corymbia maculata</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
186	<i>Callitris spp</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect

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187	<i>Lophostemon confertus</i>	A1	8.0	201.1	2.9	None	No proposed encroachment into the TPZ.	Retain and protect
188	<i>Ficus rubiginosa</i>	AA 4	14.6	669.7	3.8	Minor	The proposed building/basement encroaches into the TPZ by 5% (34.9m ²) but not into the SRZ, which is minor TPZ encroachment and indicates that the tree will not be impacted.	Retain and protect
189	<i>Eucalyptus microcorys</i>	AA 2	8.0	201.1	3.0	None	No proposed encroachment into the TPZ.	Retain and protect
190	<i>Eucalyptus microcorys</i>	A2	5.0	78.5	2.5	None	No proposed encroachment into the TPZ.	Retain and protect
191	<i>Corymbia maculata</i>	A1	3.4	36.3	2.1	None	No proposed encroachment into the TPZ.	Retain and protect
192	<i>Casuarina glauca</i>	AA 1	6.2	120.8	2.7	None	An elevated footpath is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
193	<i>Eucalyptus microcorys</i>	AA 1	7.1	158.4	2.8	None	An elevated footpath is proposed in the TPZ, see section 9.2 for tree sensitive landscaping requirements.	Retain and protect
194	<i>Syagrus romanzoffiana</i>	Z3	3.0	28.3	N/A	None	No proposed encroachment into the TPZ.	Retain and protect
195	<i>Murraya paniculata</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
196	<i>Murraya paniculata</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
197	<i>Syzygium smithii</i>	Z4	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
198	<i>Syzygium smithii</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
199	<i>Syzygium smithii</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	TPZ area (m ²)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
200	<i>Syzygium smithii</i>	Z1	2.0	12.6	1.5	None	No proposed encroachment into the TPZ.	Retain and protect
201	<i>Syagrus romanzoffiana</i>	Z3	3.0	28.3	N/A	None	No proposed encroachment into the TPZ.	Retain and protect
202	<i>Syagrus romanzoffiana</i>	Z3	3.0	28.3	N/A	None	No proposed encroachment into the TPZ.	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 Tree numbers		Category Z Tree numbers	Total trees
		AA	A	Z	
Trees recommended to be removed (impacted by building/basement)	The tree will be impacted by the constructed of the building/basement	35, 52, 55, 92 (Four trees)	10, 17, 18, 20, 21, 27, 33, 34, 48, 51, 53, 54, 56, 72, 73, 75, 84, 86, 89, 91, 98, 99, 103, 104, 105, 107, 108, 111, 112, 113, 116, 117, 118, 119, 121, 136, 147, 148, 149, 164, 165 (Forty-one trees)	9, 15, 16, 19, 22, 23, 24, 25, 26, 28, 30, 36, 43, 44, 45, 46, 47, 49, 50, 57, 58, 60, 61, 62, 63, 63a, 64, 65, 66, 67, 68, 69, 70, 71, 74, 76, 83, 85, 87, 88, 90, 94, 95, 100, 101, 102, 106, 109, 110, 114, 115, 120, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 135, 137, 138, 139, 145, 146, 162, 163, 173 (Seventy-one trees)	116 trees
Trees recommended to be retained	Removal of existing surfacing/structures and/or installation of new surfacing/structures will not impact the viability of the trees	42, 81, 132, 133, 134, 152, 177, 188, 189, 192, 193 (eleven trees)	6, 11, 12, 37, 38, 39, 40, 41, 77, 79, 93, 143, 150, 151, 159, 160, 161, 166, 168, 169, 174, 175, 176, 180, 182, 183, 187, 190, 191 (Twenty-nine trees)	1, 2, 3, 4, 5, 7, 8, 13, 14, 29, 31, 32, 59, 78, 80, 82, 96, 97, 140, 141, 142, 144, 153, 154, 158, 155, 156, 157, 167, 170, 171, 172, 178, 179, 181, 184, 185, 186, 194, 195, 196, 197, 198, 199, 200, 201, 202 (Forty-seven trees)	87 trees

9.2 Tree Sensitive Landscaping: New landscaping is proposed in the TPZ of multiple trees at the site that are to be retained during the development, which could potentially impact the trees. The landscape plan has been developed in conjunction with Urban Arbor to minimise the impact to the trees. All landscaping in the TPZ of trees to be retained should be carried out in consultation and under the supervision of the project Arborist. Specifications for tree sensitive landscaping are included below.

9.2.1 Terrace/Deck and Granite Paving Area adjoining New Mclean Street: A terrace/deck area of timber deck and granite paving is proposed in the area of the site between the building/basement and New Mclean Street. The existing landscaping in this area consists of ground level or raised planter beds and footpaths, with various retaining walls supporting the raised areas. Removing the existing raised planter beds/retaining walls and regrading this to construct the new structures is likely to impact significant roots in the TPZ. In some locations, the existing retaining walls may be assisting the stability of the trees root plate. To minimise root disturbance during re-landscaping, FJMT Studio have advised that the proposed deck and granite paving are proposed to be elevated above the existing soil grades on pier/screw pile footings. Where required, the existing landscaping (i.e. retaining walls) and soil grades are to be retained to avoid impacting the trees. To minimise the impact to trees, it is recommended that the deck in this area is constructed in accordance with following specifications;

- All demolition works in the TPZ of trees to be retained should be carried out in accordance with AS4970-2009 and supervised by the project Arborist (see section 11), who should advise of existing structures that should be retained to minimise root disturbance.
- All excavations for the footings of the timber deck should be carried out manually under the supervision of the project arborist (see section 11 for more information).
- The location of the pier footings for the deck should be flexible to avoid significant roots (roots greater than 40mm in diameter). All roots greater than 40mm in diameter must be retained unless the project arborist has assessed and approved in writing that severing the root will not impact the condition or stability of the tree.
- Piers should be located at minimum 200mm from retained roots that are greater than 40mm in diameter.
- All horizontal beams/joists are to be located on or above existing soil grades.
- To minimise the impact of reduced nutrient recycling in the TPZ, a layer of good quality composted mulch should be distributed below the deck to a depth of 75mm.
- The deck should be permeable to allow for the filtration of water to the root system below. The recommended spacing between the deck boards should be no less than 3mm to allow water to filter through.

9.2.2 Elevated Footpaths and Stairs: The construction of all elevated footpaths and stairs in the TPZ of trees to be retained will require a similar method to above, as per the following;

- All excavations for piers must be carried out manually under the supervision of the project Arborist (see section 11 for details of manual excavation and project Arborist).
- The location of piers must be flexible to avoid significant roots (roots greater than 40mm in diameter). All roots greater than 40mm in diameter must be retained unless the project arborist has assessed and approved in writing that severing the root will not impact the condition or stability of the tree.
- All horizontal beams/joists are to be located on or above existing soil grades.
- The piers should be located a minimum of 200mm from any root to be retained that is greater than 40mm in diameter.

9.2.3 Ground Level Footpaths/Hard Surfacing: The hard surfacing should be constructed above existing grades in the TPZ of the trees. The diagram below (Image A) gives an example of a no-excavation method for constructing hard surfacing close to trees. The location of retaining pegs should be flexible, avoiding damage to structural roots.

If excavations are essential, they must not exceed 100mm 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. Examples of methods that can be used to bridge individual tree roots have been included below (Image B and C). Using pier and beam bridges as per image C is the recommended/preferred method, as it will allow for future growth of the tree roots, reducing future damage to the surfacing from the roots.

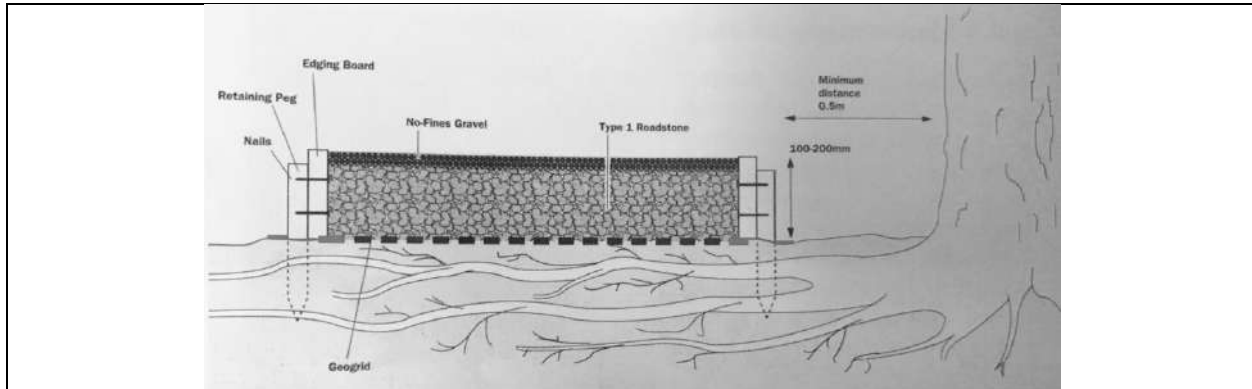


Image A: An image from 'Tree Roots in the Built Environment'⁸, showing how to construct hard surfacing above a trees root system without excavation. Type 1 Roadstones are an example of blue metal or crushed sandstone.

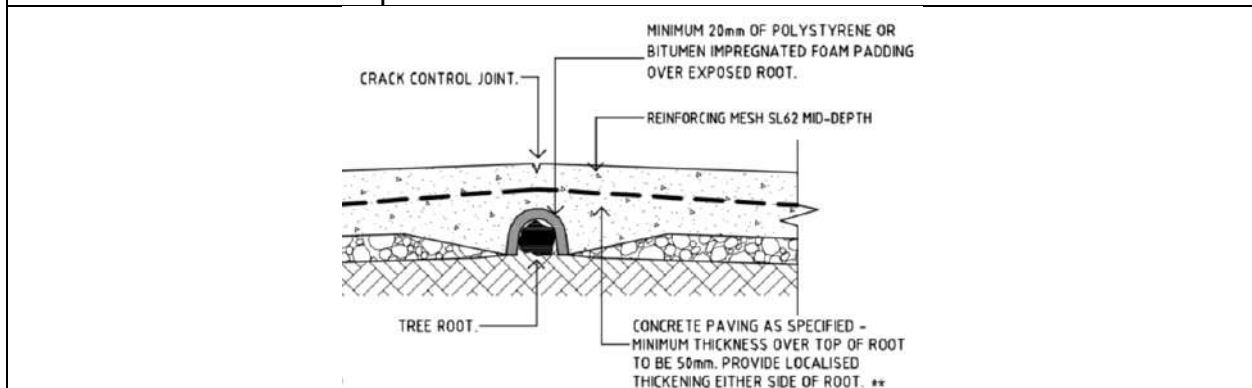


Image B: Example method for bridging concrete surfacing over tree roots provided in the Canterbury Bankstown Council standard drawings.⁹

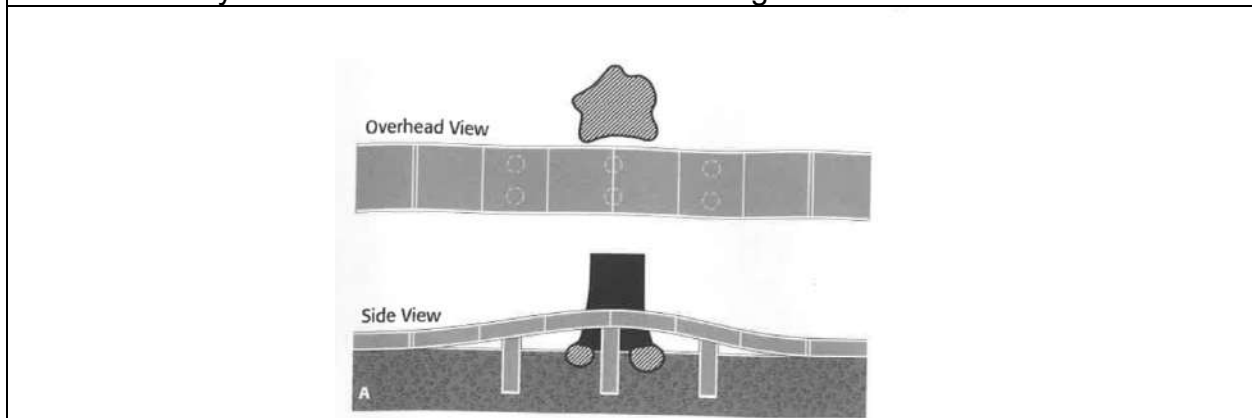


Image C: Example method from Reducing infrastructure damage by tree roots: A compendium of strategies.¹⁰

⁸ Roberts, J., Jackson, N., & Smith, M., *Tree Roots in the Built Environment*, The Stationary Office, London, England (2006). Page 305 & 306.

⁹ Canterbury Bankstown Council standard drawing S-209 Existing street tree treatments, <https://www.cbccity.nsw.gov.au/development/planning-control-policies/council-standard-drawings>, accessed 3 October 2019.

¹⁰ Costello, L. R., & Jones, K. S., *Reducing infrastructure damage by tree roots: A compendium of strategies*, Western Chapter of the International Society of Arboriculture, 31883 Success Valley Drive, Porterville, CA (2003), page 27. Report on trees at: 8-10 New McLean St, Edgecliff, NSW.

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9.2.4 Tree Sensitive Retaining Walls: To reduce the impact of the retaining walls, timber sleeper retaining walls should be used to avoid severing/pruning significant roots in the TPZ (no continuous strip footing). During the construction of the retaining walls, all sleepers should be located on or above existing soil grades, and pier/post locations should be flexible to avoid significant roots (roots greater than 40mm in diameter) that are critical to the health and stability of the tree. The project Arborist should directly supervise the construction of retaining walls and no roots greater than 40mm in diameter should be pruned/severed unless assessed and approved in writing by the project Arborist.

9.2.5 Sandstone Logs: All sandstone logs should be located above the existing soil grades of the TPZ to be retained unless it has been demonstrated via non-destructive root investigations that significant roots (roots greater than 40mm in diameter) will not be impacted by the proposed excavations.

9.2.6 Other Landscaping Specifications: 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.

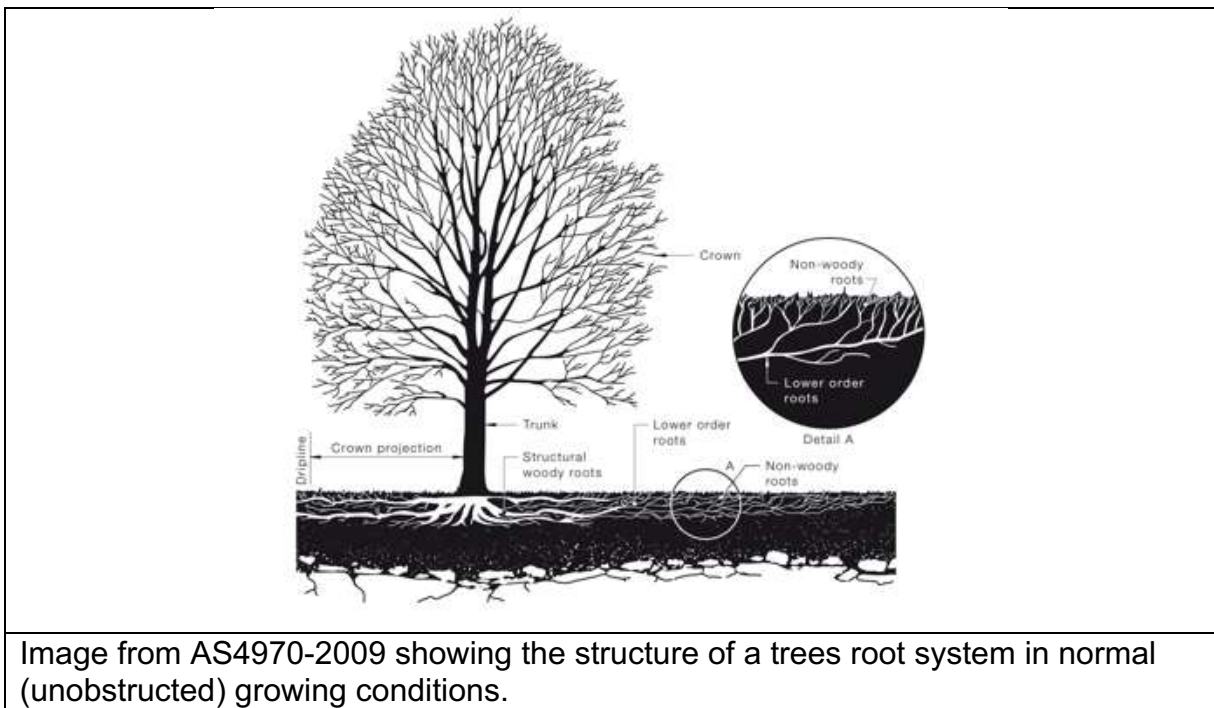
- All demolition and excavations for landscaping works should be manual and in accordance with section 11.9.
- Replacement planting for all trees recommended for removal should be incorporated into the landscape plan. It is recommended that at minimum one tree for each tree proposed to be removed are 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.
- 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. See section 9.2.4 for more information.
- 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. See section above for more information in relation to tree sensitive footpaths and hard surfacing.

- 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 be 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.

9.3 Bulk Earthworks Impacts - Soil Level Modifications (Cut and Fill): No bulk earthworks or soil level modification plan has been assessed in this report, all bulk earthworks or soil level modification plans should be subject to review by a consulting Arborist. Cut and fill can significantly impact trees, as the per following;

9.3.1 Cut: A trees root system is generally located far shallower in the soil than is normally considered, and should be thought of as a 'root plate'. The majority of a trees root growth is usually found in the upper 600mm of the soil closest to the surface, but a percentage of the roots will extend deeper in the soil. An image has been included below that is taken from AS4970-2009, and provides an example of the structure of a trees root system. Any significant cut/lowering the soil level in the TPZ can impact the tree. The only way to identify the precise impact to a trees root system by cut in the TPZ is by carrying out detailed root investigation to identify the individual significant roots. No detailed root investigations have been undertaken as part of the assessment.



9.3.2 **Fill:** Tree roots require air, water and nutrients to function properly. Increasing the soil level in the TPZ can impact the trees by reducing the availability of water, nutrients and air to the trees underlying root system and can cause the decline of a trees health and vigour. Placing fill directly against the trunk of a tree can potentially cause collar rot. Collar rot forms when soil against the trunk of the tree accelerates sapwood or heartwood decay.¹¹

9.4 Review of Proposed Relocation of Existing Services

9.4.1 The proposed development documents include a Services Infrastructure Report (Stantec Australia Pty Ltd, 27 July 2023), which identifies the existing service infrastructure within site. The report recommends relocating various services at the site.

9.4.2 To assist with reviewing the impact of the proposed services relocation, Angus Nguyen of the Landmark Group has provided a supplementary document, which has been attached to this report as an appendix for reference.

9.4.3 The Services Infrastructure Report and information by Angus Nguyen provide indicative locations for the relocation of services. However, detailed proposed service layout drawings have not been provided. To calculate TPZ encroachments and potential impacts to each individual tree in accordance with AS4970-2009, detailed service plans are required that identify the precise location and dimensions of the proposed services.

9.4.4 The information provided in this section of the report is general information to minimise the impact of the services relocation to the trees at the site, not an impact assessment of the proposed service works to the viability of trees in accordance with AS4970-2009.

9.4.5 To minimise the impact to the trees, Angus Nguyen has advised that all existing services will be disconnected only and not demolished, except where the existing services are required to be removed accommodate the construction works that have been assessed in section 8. The method and location where the existing services will be disconnected has not been identified. Any excavation required for the disconnection of existing services in the TPZ of trees to be retained will need to be carried out via tree sensitive methods to avoid impacting significant roots. These works will need to be supervised and guided by the project Arborist (see section 11) to minimise the impact to trees.

9.4.6 There are multiple significant trees that are proposed to be retained located outside the footprint of the basement. Any proposed underground services within the TPZ of the trees will potentially impact trees.

9.4.7 To minimise the impact to trees, the design layout of the relocated services should be carried in consultation with a consulting Arborist. Where practical, all proposed

¹¹ Dunster, Julian A., Thomas Smiley, Nelda Matheny, and Sharon Lilly, *Tree Risk Assessment Manual*, Champaign, Illinois: International Society of Arboriculture (2013), page 108.

services should be aligned as far as practical from the TPZ of trees that proposed to be retained.

- 9.4.8 When designing the layout of services, the TPZ of trees to be retained should be overlaid onto the proposed drawings to assist with designing to locate the services as far from the trees as possible.
- 9.4.9 To minimise tree and root impacts, the location of existing structures and proposed structures in the TPZ should be carefully considered.
- 9.4.10 Angus Nguyen has advised that services in close proximity to the basement can be diverted along the inside of the basement shoring wall. Any proposed services that can be located within the footprint of the basement will not impact trees to be retained, as any root loss from the proposed basement has been considered for each tree to be retained in section 8.
- 9.4.11 The location of existing structures should also be considered during the design. There are various significant existing structures within the TPZ of the trees to be retained that are restricting root growth to particular areas of the TPZ, such as the existing buildings and retaining walls. If the services are located within the footprint or opposite side of the existing structures, significant root will not be impacted.
- 9.4.12 In any location where services are proposed in the TPZ to be retained (with exception of structures discussed above), all services will need to be installed via tree sensitive methods to minimise root impacts. AS4970-2009 recommends that all underground services located inside the TPZ of any tree to be retained should be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention.
- 9.4.13 If directional drilling is proposed, section 4.5.5 of AS4970-2009 says that 'The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees'.¹²
- 9.4.14 If manual excavations are proposed, all excavations for the services should be carried out manually under the supervision of the project Arborist (minimum qualification AQF 5). Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. All roots greater than 40mm in diameter should be retained in the service trench. The service pipe should then be threaded below the retained roots where practical. Roots greater than 40mm within the alignment of the service pipe should only be severed/pruned under the approval of the project Arborist. All root pruning should be in accordance with AS4373 Pruning of amenity trees (2007).
- 9.4.15 Open trenching in the SRZ of trees can be impractical without impacting significant roots, as often dense root growth is present in the SRZ. Open trenching should therefore be avoided in the SRZ. It is recommended that any section of pipe that is located in the SRZ of trees to be retained is installed via sub-surface boring/directional drilling methods only. The feasibility of sub-surface

¹² Council Of Standards Australia, AS 4970 Protection of trees on development sites (2009) page 18.

boring/directional drilling will need to be investigated by a sub-surface boring/directional drilling specialist. The project Arborist should provide advice and supervise excavations for bore pits, which must be carried out manually if located within the TPZ. The top of the pipe must be at least 600mm below the existing soil grade. The location of bore pits should be flexible in the TPZ to avoid significant roots, the project Arborist should assess and advise in writing the impact of any significant root severance to the condition of the tree.

- 9.4.16 During the design of the services, the location where tree sensitive is proposed/required in the TPZ of trees to be retained should be clearly identified. A relevant specificity will need to certify that the tree sensitive methods can be adequately implemented in the proposed locations to demonstrate that this is a viable option and the trees will not be significantly impacted.

10. RECOMMENDATIONS

- 10.1 This report assesses the impact of a proposed development at the subject site to all significant trees located within five metres of development works. Two hundred and three trees have been identified and assessed.
- 10.2 In appendix 1 three 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 ground floor plan
 - Appendix 1C: Proposed basement
- 10.3 One hundred and sixteen trees have been identified that will be impacted by the proposed building/basement construction and will need to be removed, including tree 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 33, 34, 35, 36, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 60, 61, 62, 63, 63a, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 94, 95, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 135, 136, 137, 138, 139, 145, 146, 147, 148, 149, 162, 163, 164, 165 and 173. See section 9.1 for a list of the trees by retention value.
- 10.4 The other eight-seven trees can be retained in a viable condition, including tree 1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 29, 31, 32, 37, 38, 39, 40, 41, 42, 59, 77, 78, 79, 80, 81, 82, 93, 96, 97, 132, 133, 134, 140, 141, 142, 143, 144, 150, 151, 152, 153, 154, 158, 155, 156, 157, 159, 160, 161, 166, 167, 168, 169, 170, 171, 172, 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 and 202.
- 10.5 All trees to be retained must be protected in accordance with AS4970-2009, generic details of which are included in section 11. It is recommended that a site-specific Tree Protection Plan (TPP) is prepared in accordance with AS4970 Protection of trees on development site (2009) to address this condition. The TPP should be developed in conjunction with the overall Construction Management Plan for the site, based on finalised design layout and other factors, such as site access routes and storage locations. As the document relies on input by other consultants/contractors to be effective for protecting trees at the site, it is recommended that the TPP is prepared as part of the Construction Certificate lodgement for the development.
- 10.6 No civil or bulk earthwork plans have been assessed in this report. See section 9.3 for more information.
- 10.7 See section 9.2 for guidance in relation to tree sensitive landscaping construction in the TPZ of trees to be retained.

- 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 or pruning works. All recommendations in this report are subject to approval by the relevant authorities and/or tree owners. This report should be submitted as supporting evidence with the development application.

11. TREE PROTECTION REQUIREMENTS

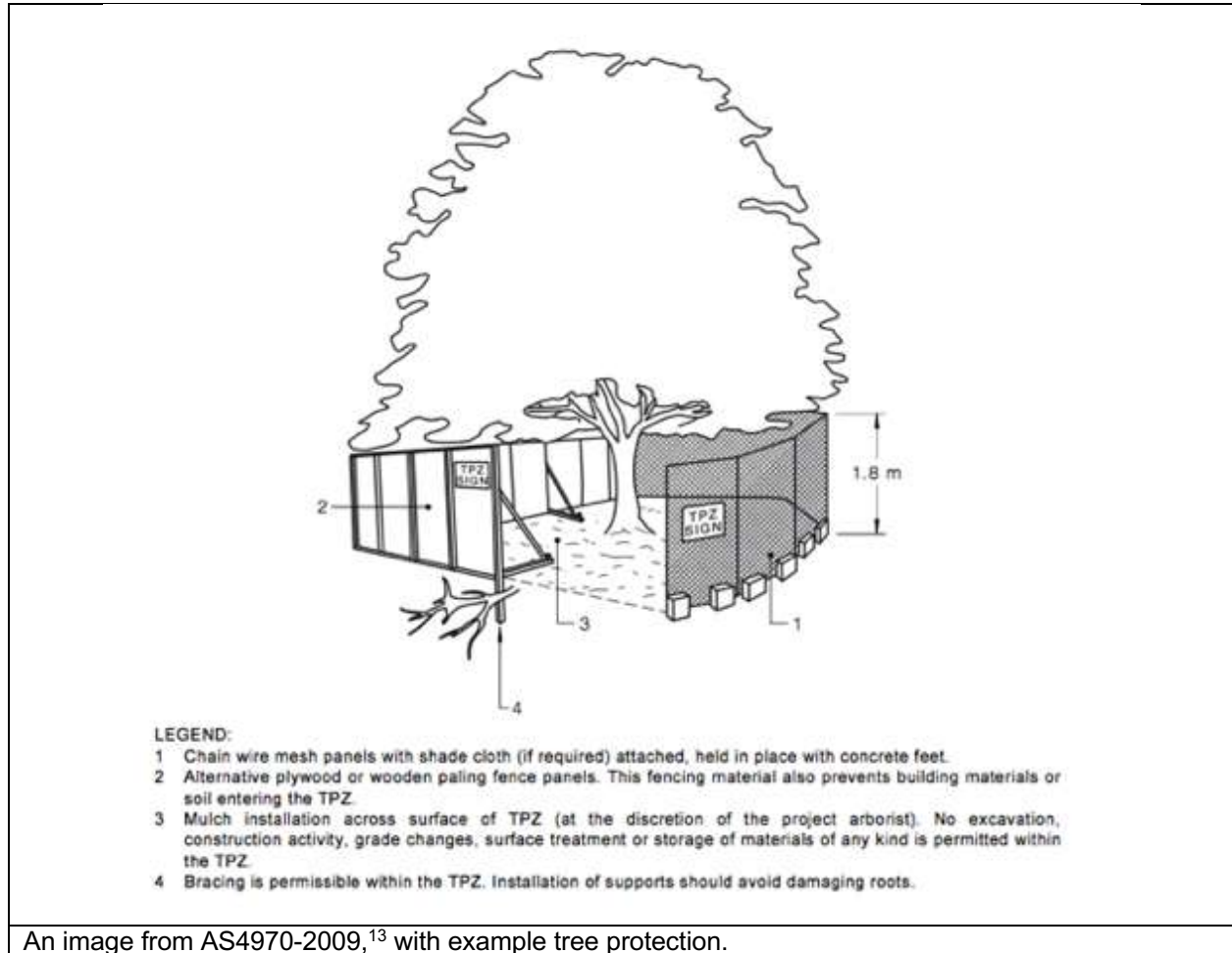
- 11.1 **Use of this report:** All contractors must be made aware of the tree protection requirements prior to commencing works at the site. This report and a copy of the site plans (Appendix 1) drawing must also be made available to any contractor prior to works commencing and during any on site operations.
- 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 **Tree Protection Specifications:**
- 11.5.1 **Trunk and Branch Protection:** The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm x 1800mm or similar) should then be placed around tree trunk. The timber planks should be spaced at 100mm intervals and must be fixed against the trunk with tie wire or strapping and connections finished or covered to protect pedestrians from injury. The hessian and timber planks must not be fixed to the tree in any instance. The trunk and branch protection shall be installed prior to any work commencing on site and shall be maintained in good condition for the entire development period.
- 11.5.2 **Protective fencing:** The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing should only be removed for the landscaping phase and this should be approved by the project Arborist. Where it is not feasible to install fencing at the specified location due to factors such restricting access to areas of the site or for constructing new structures, an alternative location and protection specification must be agreed with the project Arborist. Any modifications to the fencing locations must be approved by the project Arborist.
- 11.5.3 **TPZ signage:** Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:
- Tree protection zone/No access.

- This fence has been installed to prevent damage to the tree/s and their growing environment both above and below ground. Do not move fencing or enter TPZ without the agreement of the project Arborist.
- The name, address, and telephone number of the developer/builder and project Arborist

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

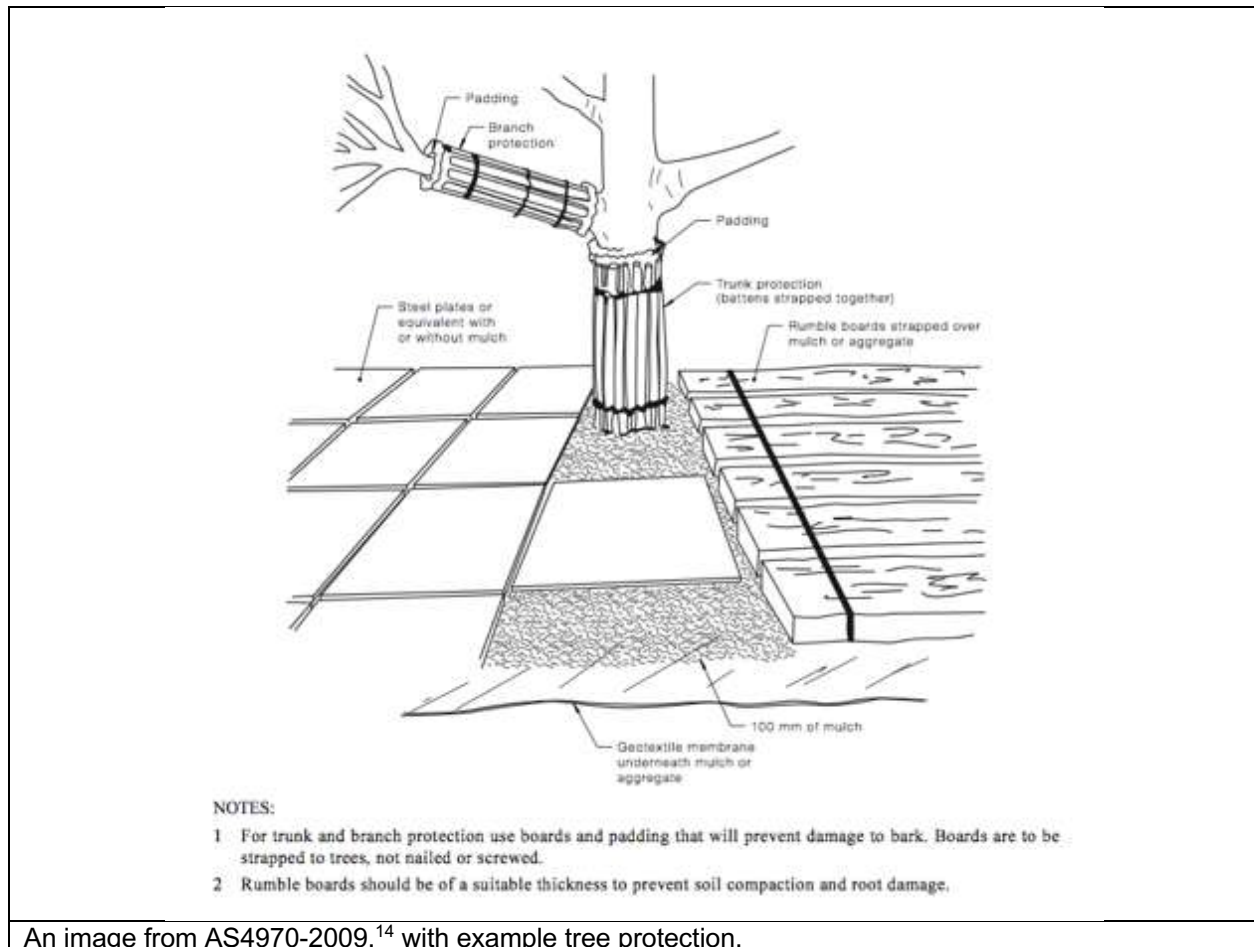
11.5.5 Ground Protection: Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to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

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



An image from AS4970-2009,¹³ with example tree protection.

¹³ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 16.
Report on trees at: 8-10 New McLean St, Edgecliff, NSW.
Prepared for: Mount St 4 Pty Ltd.
Prepared by: Jack Williams and Bryce Claassens, Urban Arbor, jack@urbanarbor.com.au, (02) 8004 2802.
Date: 17 November 2023 - Revision 4.



An image from AS4970-2009,¹⁴ with example tree protection.

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

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

¹⁴ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 17.
Report on trees at: 8-10 New McLean St, Edgecliff, NSW.
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Prepared by: Jack Williams and Bryce Claassens, Urban Arbor, jack@urbanarbor.com.au, (02) 8004 2802.
Date: 17 November 2023 - Revision 4.

- 11.7 **Demolition:** The demolition of all existing structures inside or directly adjacent to the TPZ of trees to be retained must be undertaken in consultation with the project Arborist. Any machinery is to work from inside the footprint of the existing structures or outside the TPZ, reaching in to minimise soil disturbance and compaction. If it is not feasible to locate demolition machinery outside the TPZ of trees to be retained, ground protection will be required. The demolition should be undertaken inwards into the footprint of the existing structures, sometimes referred to as the 'top down, pull back' method.
- 11.8 **Excavations:** The project Arborist must supervise and certify that all excavations and root pruning are in accordance with AS4373-2007 and AS4970-2009. For continuous strip footings, first manual excavation is required along the edge of the structures closest to the subject trees. Manual excavation should be a depth of 1 metre (or to unfavourable root growth conditions such as bed rock or heavy clay, if agreed by project Arborist). Next roots must be pruned back in accordance with AS4373-2007. After all root pruning is completed, machine excavation is permitted within the footprint of the structure. For tree sensitive footings, such as pier and beam, all excavations inside the TPZ must be manual. Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. No pruning of roots greater 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).¹⁵ 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.
- 11.9 **Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimise the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.
- All excavations for landscaping works should be manual and in accordance with section 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.

¹⁵ 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.
- 11.10 **Underground Services:** Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention. No roots greater than 30mm in diameter should be severed during the installation of service pipes unless approved in writing by the project Arborist.
- 11.11 **Sediment and Contamination:** All contamination run off from the development such as but not limited to concrete, sediment and toxic wastes must be prevented from entering the TPZ at all times.
- 11.12 **Tree Wounding/Injury:** Any wounding or injury that occurs to a tree during the construction process will require the project Arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. It is generally accepted that trees may take many years to decline and eventually die from root damage. All repair work is to be carried out by the project Arborist, at the contractor's expense.
- 11.13 **Completion of Development Works:** After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.

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	

13. BIBLIOGRAPHY/REFERENCES

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

14. LIST OF APPENDICES

The following are included in the Appendices:

- Appendix 1: Site Plans
- Appendix 2: Tree Inspection Schedule
- Appendix 3: Further Information of Methodology
- Appendix 4: Additional Information for Services Relocation, Angus Nguyen (Landmark Group)



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Member Arboriculture Australia
Quantified Tree Risk Assessment
ISA Tree Risk Assessment Qualification



Map Legend

- Tree Crown
- Tree Protection Zone
- Structural Root Zone



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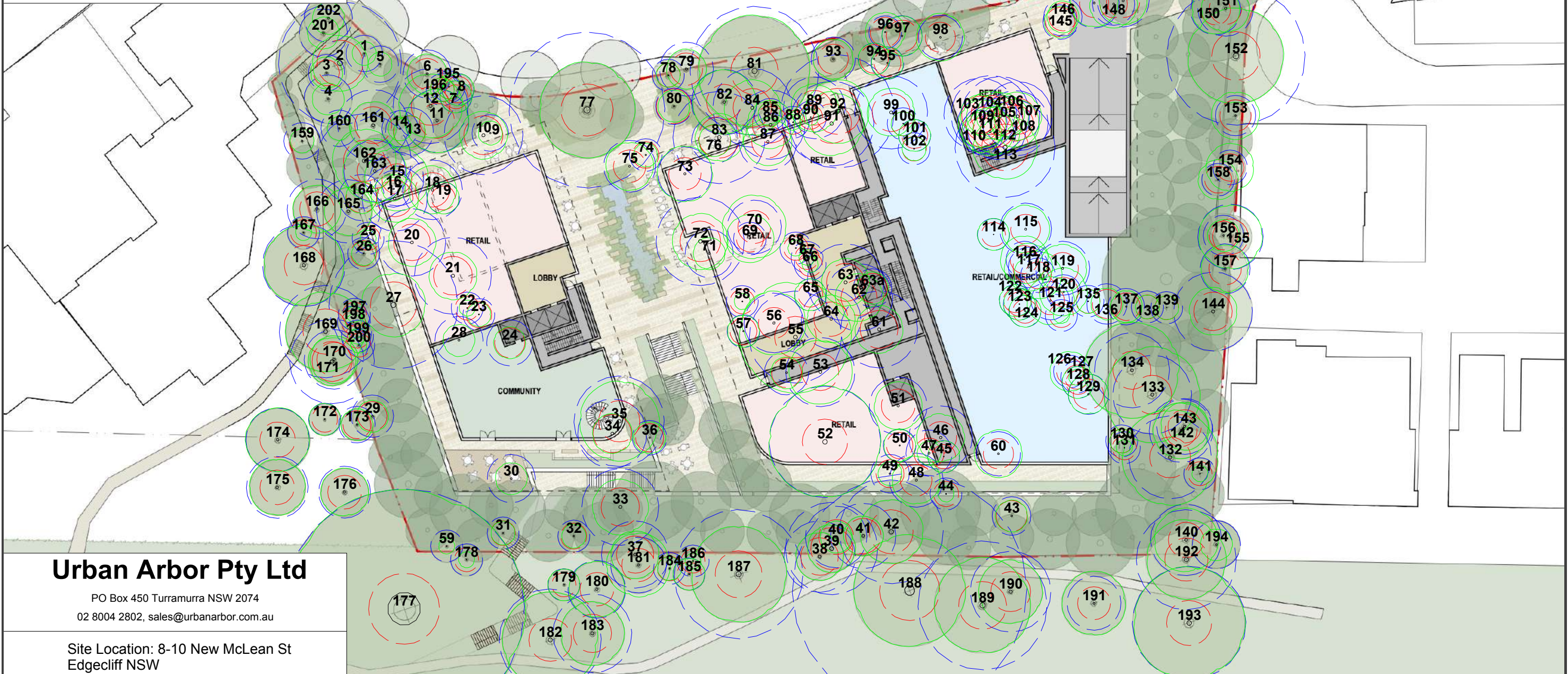
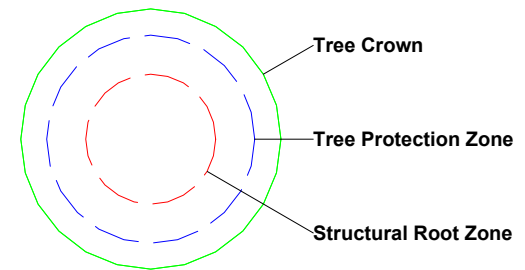
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 Edgecliff NSW

SCALE : 1 : 250	@ A1	DATE : 28/04/2023
Plan Title: Appendix 1A		

Prepared by: Jack Williams



Map Legend



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Site Location: 8-10 New McLean St
Edgecliff NSW

SCALE :
1 : 500 @ A3

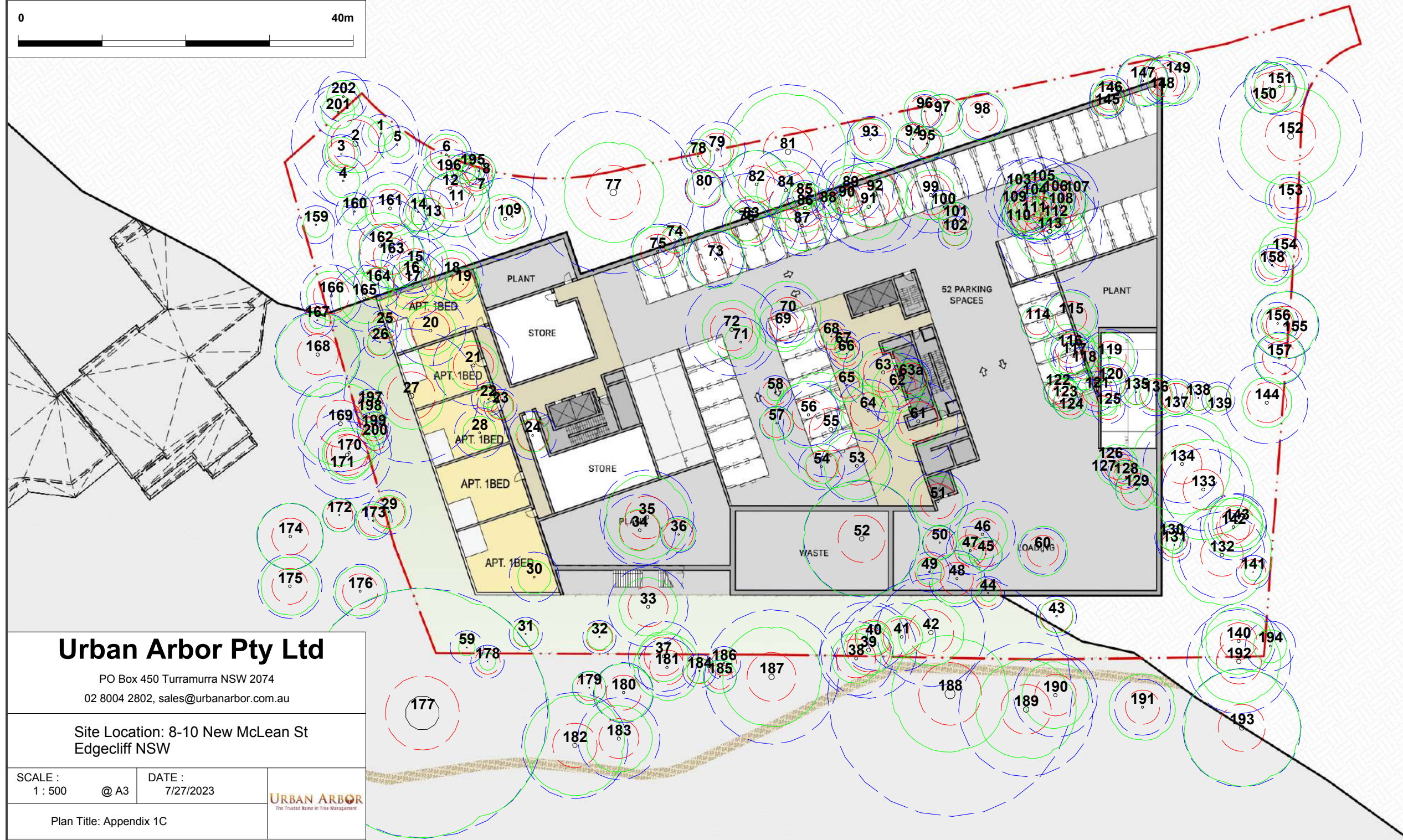
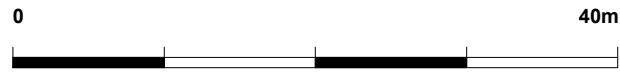
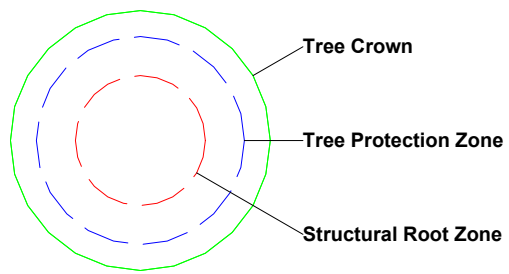
DATE :
7/27/2023



Plan Title: Appendix 1B

Prepared by: Jack Williams and Bryce Claassens

Map Legend



Urban Arbor Pty Ltd

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Site Location: 8-10 New McLean St
Edgecliff NSW

SCALE : 1 : 500 @ A3 DATE : 7/27/2023



Plan Title: Appendix 1C

Prepared by: Jack Williams and Bryce Claassens

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	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	9	1.5	320						320	N/A	Good	Good	Low	2. Medium	Z3	2.5	N/A	Exempt species.
2	Schefflera Species	<i>Schefflera spp</i>	Mature	7	3.5	290	340	270	280	240		639	710	Good	Fair	Medium	3. Short	Z9	7.7	2.9	Co-dominant stems at base with included bark at unions. Girdling roots around base, it appears the tree was partially containerised by retaining wall that has been removed or failed.
3	Orange Jessamine	<i>Murraya paniculata</i>	Semi-mature	4	2	130	140					191	180	Good	Good	Low	5. Small/Young	Z1	2.3	1.6	None.
4	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	10	2	240						240	N/A	Good	Good	Low	2. Medium	Z3	3.0	N/A	Exempt species.
5	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	10	1.5	230						230	N/A	Good	Good	Low	2. Medium	Z3	2.5	N/A	Exempt species.
6	Queensland Brushbox	<i>Lophostemon confertus</i>	Semi-mature	5	2.5	250						250	280	Good	Fair	Medium	1. Long	A1	3.0	1.9	Asymmetric crown shape and significant trunk lean.
7	Orange Jessamine	<i>Murraya paniculata</i>	Mature	6	2	120						120	130	Good	Good	Low	2. Medium	Z1	2.0	1.5	Managed as hedge.
8	Orange Jessamine	<i>Murraya paniculata</i>	Mature	6	2	100	100	70				158	190	Good	Good	Low	2. Medium	Z1	2.0	1.6	Managed as hedge.
9	Kentea Palm	<i>Howea forsteriana</i>	Semi-mature	5	1.5	120						120	N/A	Good	Good	Low	1. Long	Z1	2.5	N/A	None.
10	Robinia	<i>Robinia pseudoacacia</i>	Mature	8	3	410						410	480	Good	Fair	Medium	2. Medium	A1	4.9	2.4	Trunk leans near base then straightens.
11	Robinia	<i>Robinia pseudoacacia</i>	Mature	9	4	330						330	370	Good	Fair	Medium	2. Medium	A1	4.0	2.2	Asymmetric crown shape.
12	Robinia	<i>Robinia pseudoacacia</i>	Mature	10	4	390						390	470	Good	Fair	Medium	2. Medium	A1	4.7	2.4	Asymmetric crown shape.
13	Robinia	<i>Robinia pseudoacacia</i>	Semi-mature	9	2	250						250	290	Good	Fair	Medium	2. Medium	Z10	3.0	2.0	Trunk curves significantly due to suppression from adjacent trees.
14	Kentea Palm	<i>Howea forsteriana</i>	Semi-mature	5	1.5	120						120	N/A	Good	Good	Low	5. Small/Young	Z1	2.5	N/A	None.
15	Robinia	<i>Robinia pseudoacacia</i>	Semi-mature	7	4	200	190					276	260	Fair	Fair	Low	2. Medium	Z10	3.3	1.9	Suppressed form.
16	Kentea Palm	<i>Howea forsteriana</i>	Semi-mature	4	1.5	100						100	N/A	Good	Good	Low	5. Small/Young	Z1	2.0	N/A	None.
17	Robinia	<i>Robinia pseudoacacia</i>	Mature	12	3	340						340	410	Good	Fair	Medium	2. Medium	A1	4.1	2.3	Trunk leans and curves significantly.
18	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	14	3	310						310	360	Good	Good	Medium	1. Long	A1	3.7	2.2	None.
19	Avacado	<i>Persea americana</i>	Semi-mature	7	2	140						140	150	Good	Good	Low	1. Long	Z1	2.0	1.5	None.
20	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	13	3	350						350	410	Good	Good	Medium	1. Long	A1	4.2	2.3	None.
21	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	11	3	400						400	468	Good	Good	Medium	1. Long	A1	4.8	2.4	None.
22	Southern Magnolia	<i>Magnolia grandiflora</i>	Semi-mature	6	1	120						120	130	Good	Good	Low	1. Long	Z1	2.0	1.5	None.
23	Lemon Scented Myrtle	<i>Backhousia citriodora</i>	Semi-mature	6	1.5	110	70					130	180	Good	Good	Low	1. Long	Z1	2.0	1.6	None.
24	Loquat	<i>Eriobotrya japonica</i>	Mature	5	2	240						240	260	Good	Good	Low	2. Medium	Z1	2.9	1.9	None.
25	Lilly Pilly	<i>Syzygium smithii</i>	Semi-mature	7	1	130						130	140	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
26	Lilly Pilly	<i>Syzygium smithii</i>	Semi-mature	7	1.5	150						150	180	Good	Good	Medium	1. Long	Z1	2.0	1.6	None.
27	Willow Myrtle	<i>Agonis flexuosa</i>	Mature	7	4	500	460					679	720	Good	Fair	Medium	2. Medium	A1	8.2	2.9	Asymmetric crown shape. Co-dominant stems at 0.5m with included bark at union, however the union appears stable.
28	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	8	2	310						310	N/A	Good	Good	Low	2. Medium	Z3	3.0	N/A	None.
29	Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	Semi-mature	7	2	220						220	240	Good	Fair	Medium	2. Medium	Z1	2.6	1.8	Co-dominant stems at 2m with included bark at union and significant response growth.
30	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	8	2	240						240	N/A	Good	Good	Low	2. Medium	Z3	3.0	N/A	Exempt species.
31	Firewheel	<i>Stenocarpus sinuatus</i>	Semi-mature	7	1.5	140						140	160	Good	Good	Low	1. Long	Z1	2.0	1.5	None.
32	Illawara Flame	<i>Brachychiton acerifolius</i>	Semi-mature	5	1.5	160						160	180	Good	Good	Low	5. Small/Young	Z1	2.0	1.6	None.
33	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Mature	10	3.5	400						400	460	Good	Good	Medium	1. Long	A1	4.8	2.4	None.
34	Willow Myrtle	<i>Agonis flexuosa</i>	Mature	5	2.5	310	180					358	460	Good	Fair	Medium	2. Medium	A1	4.3	2.4	Asymmetric crown shape and significant trunk lean.
35	Spotted Gum	<i>Corymbia maculata</i>	Mature	18	5	470						470	550	Good	Good	High	1. Long	AA1	5.6	2.6	Located in courtyard and no access at time of inspection. Not tagged and DBH estimated.
36	Blueberry Ash	<i>Elaeocarpus reticulatus</i>	Mature	7	2	180						180	220	Good	Fair	Medium	2. Medium	Z10	2.2	1.8	Significant trunk lean. Located in courtyard and no access at time of inspection. Not tagged and DBH estimated.
37	Robinia	<i>Robinia pseudoacacia</i>	Mature	8	3	350						350	430	Good	Fair	Medium	2. Medium	A1	4.2	2.3	Minor trunk lean.
38	Swamp Oak	<i>Casuarina glauca</i>	Mature	15	3	370						370	440	Good	Fair	Medium	2. Medium	A1	4.4	2.3	Asymmetric crown shape.
39	Swamp Oak	<i>Casuarina glauca</i>	Mature	16	3	480						480	570	Good	Fair	Medium	2. Medium	A1	5.8	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	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
40	Swamp Oak	<i>Casuarina glauca</i>	Mature	16	2	320						320	370	Good	Good	Medium	2. Medium	A1	3.8	2.2	None.
41	Swamp Oak	<i>Casuarina glauca</i>	Mature	14	2.5	340						340	380	Good	Fair	Medium	2. Medium	A1	4.1	2.2	Asymmetric crown shape.
42	Swamp Oak	<i>Casuarina glauca</i>	Mature	16	4	540						540	640	Good	Good	High	1. Long	AA1	6.5	2.7	None.
43	Water Gum	<i>Tristaniopsis laurina</i>	Semi-mature	5	2	150	130					198	280	Good	Fair	Low	1. Long	Z1	2.4	1.9	None.
44	Coastal Banksia	<i>Banksia integrifolia</i>	Dead	4	1	140						140	170	Poor	Poor	Very Low	4. Remove	ZZ4	2.0	1.6	
45	Blueberry Ash	<i>Elaeocarpus reticulatus</i>	Semi-mature	4	2	100						100	110	Fair	Fair	Low	3. Short	Z4	2.0	1.5	Apical dieback.
46	Umbrella	<i>Schefflera actinophylla</i>	Mature	7	3	240	230					332	300	Good	Fair	Low	2. Medium	Z3	4.0	2.0	Exempt species. Co-dominant stems at 1m, union appears stable.
47	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	8	1.5	240						240	260	Fair	Fair	Medium	3. Short	Z4	2.9	1.9	Low foliage density for species.
48	Coastal Banksia	<i>Banksia integrifolia</i>	Semi-mature	6	3	240	140					278	290	Good	Fair	Medium	1. Long	A2	3.3	2.0	Co-dominant stems near base with included bark at union, defect can be mitigated via pruning.
49	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	9	1.5	200						200	220	Good	Good	Medium	1. Long	Z1	2.4	1.8	None.
50	Coastal Banksia	<i>Banksia integrifolia</i>	Semi-mature	4	2	170						170	190	Good	Fair	Low	2. Medium	Z1	2.0	1.6	Trunk skews at two heights.
51	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	9	3	300						300	340	Good	Good	Medium	1. Long	A1	3.6	2.1	None.
52	Bangalay	<i>Eucalyptus botryoides</i>	Mature	22	7	580						580	690	Good	Good	High	1. Long	AA2	7.0	2.8	Significant diameter deadwood.
53	Tallowood	<i>Eucalyptus microcorys</i>	Mature	16	4	360						360	420	Fair	Good	High	2. Medium	A2	4.3	2.3	Significant deadwood in lower crown.
54	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	12	2	230						230	250	Good	Fair	Medium	1. Long	A1	2.8	1.8	Asymmetric crown shape.
55	Blackbutt	<i>Eucalyptus pilularis</i>	Mature	25	7	480						480	560	Good	Fair	High	1. Long	AA1	5.8	2.6	Asymmetric crown shape.
56	Blue Jacaranda	<i>Jacaranda mimosifolia</i>	Mature	8	4	250	190					314	280	Good	Fair	Medium	1. Long	A1	3.8	1.9	Asymmetric crown shape.
57	Swamp Mahogany	<i>Eucalyptus robusta</i>	Semi-mature	9	2	170						170	200	Poor	Fair	Low	4. Remove	Z4	2.0	1.7	Health in decline, minimal live foliage.
58	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	7	1	140						140	160	Fair	Fair	Low	2. Medium	Z1	2.0	1.5	Suppressed form and condition.
59	Bangalow Palm	<i>Archontophoenix</i>	Semi-mature	6	1	140						140	N/A	Good	Good	Low	1. Long	Z1	2.0	N/A	None.
60	Chinese Hackberry	<i>Celtis sinensis</i>	Semi-mature	8	3	230						230	260	Good	Fair	Low	1. Long	Z3	2.8	1.9	Exempt species. Located in courtyard and no access at time of inspection. Not tagged and DBH estimated.
61	Orange Jessamine	<i>Murraya paniculata</i>	Mature	6	3	400						400	450	Good	Good	Low	1. Long	Z1	4.8	2.4	Located in courtyard and no access at time of inspection. Not tagged and DBH estimated.
62	Leyland Cypress	<i>X Cupressocyparis leylandii</i>	Mature	8	3	350						350	400	Good	Fair	Low	2. Medium	Z3	4.2	2.3	Located in courtyard and no access at time of inspection. Not tagged and DBH estimated. Crown lifted to 5m.
63	Leyland Cypress	<i>X Cupressocyparis leylandii</i>	Mature	8	3	400						400	450	Good	Good	Low	2. Medium	Z3	4.8	2.4	Located in courtyard and no access at time of inspection. Not tagged and DBH estimated. Crown lifted to 5m.
64	Blackbutt	<i>Eucalyptus pilularis</i>	Semi-mature	14	3	270	150					309	360	Fair	Fair	Medium	3. Short	Z4	3.7	2.2	Extensive cambium/longicorn damage at base of trunk. Low foliage density for species, likely due to ring barking from cambium damage
65	Willow Myrtle	<i>Agonis flexuosa</i>	Semi-mature	5	2	140						140	160	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape.
66	African Olive	<i>Olea europaea subsp. cuspidata</i>	Semi-mature	6	1	90						90	120	Good	Fair	Very Low	5. Small/Young	Z3	2.0	1.5	Exempt species.
67	Cheese Tree	<i>Glochidion ferdinandi</i>	Semi-mature	6	1	140						140	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
68	Cheese Tree	<i>Glochidion ferdinandi</i>	Semi-mature	9	1	150						150	160	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
69	Chinese Hackberry	<i>Celtis sinensis</i>	Semi-mature	7	3	170						170	200	Good	Good	Low	1. Long	Z3	2.0	1.7	Exempt species.
70	Chinese Hackberry	<i>Celtis sinensis</i>	Semi-mature	10	4	270	80					282	320	Good	Good	Low	1. Long	Z3	3.4	2.1	Exempt species.
71	Giant Strelitzia	<i>Strelitzia nicolai</i>	Mature	6	2	400						400	N/A	Good	Good	Low	2. Medium	Z3	3.0	N/A	Exempt species. Multi stemmed, DBH estimated at base.
72	River She Oak	<i>Casuarina cunninghamiana</i>	Mature	13	3.5	460						460	530	Fair	Fair	Medium	2. Medium	A2	5.5	2.5	Reduced foliage density for species. Asymmetric crown shape.

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	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
73	Chinese Elm	<i>Ulmus parviflora</i>	Mature	8	3.5	280						280	310	Good	Good	Medium	1. Long	A1	3.4	2.0	None.
74	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	9	1.5	170						170	190	Good	Good	Medium	1. Long	Z1	2.0	1.6	None.
75	Chinese Elm	<i>Ulmus parviflora</i>	Semi-mature	7	3	270						270	310	Good	Fair	Medium	1. Long	A1	3.2	2.0	Trunk skews at 2m.
76	Dead Tree	<i>Dead Tree</i>	Dead	7	2	240						240	290	Poor	Poor	Very Low	4. Remove	ZZ4	2.9	2.0	None.
77	Tasmanian Blue Gum	<i>Eucalyptus globulus</i>	Mature	15	6	810						810	960	Fair	Fair	High	2. Medium	A2	9.7	3.3	Reduced foliage density for species. Significant diameter
78	Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	Semi-mature	4	1.5	140						140	150	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape.
79	Swamp Oak	<i>Casuarina glauca</i>	Semi-mature	10	2.5	280						280	310	Good	Good	Medium	1. Long	A1	3.4	2.0	Minor trunk lean.
80	Crepe Myrtle	<i>Lagerstroemia indica</i>	Semi-mature	5	2	110	100	70	60	60		185	370	Good	Good	Low	5. Small/Young	Z1	2.2	2.2	None.
81	Sydney Blue Gum	<i>Eucalyptus saligna</i>	Mature	22	7	670						670	760	Good	Fair	High	2. Medium	AA2	8.0	2.9	Co-dominant stems at 4m with good open form to union
82	Sydney Blue Gum	<i>Eucalyptus saligna</i>	Semi-mature	11	4	340						340	380	Fair	Fair	Medium	2. Medium	Z10	4.1	2.2	Asymmetric crown shape and suppressed form.
83	Dead Tree	<i>Dead Tree</i>	Dead	12	3	480						480	560	Poor	Poor	Very Low	4. Remove	ZZ4	5.8	2.6	None.
84	Swamp Oak	<i>Casuarina glauca</i>	Mature	14	3.5	410						410	470	Good	Good	Medium	1. Long	A1	4.9	2.4	None.
85	Swamp Oak	<i>Casuarina glauca</i>	Semi-mature	5	1.5	130						130	140	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape.
86	Swamp Oak	<i>Casuarina glauca</i>	Mature	12	3	360						360	410	Good	Good	Medium	1. Long	A1	4.3	2.3	None.
87	Swamp Oak	<i>Casuarina glauca</i>	Mature	11	3	250	170					302	310	Good	Fair	Medium	3. Short	Z9	3.6	2.0	Co-dominant stems near base with significant included bark at
88	Swamp Oak	<i>Casuarina glauca</i>	Semi-mature	7	1	130						130	140	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
89	Swamp Oak	<i>Casuarina glauca</i>	Mature	13	3	320						320	370	Good	Good	Medium	1. Long	A1	3.8	2.2	None.
90	Swamp Oak	<i>Casuarina glauca</i>	Semi-mature	6	1	130						130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
91	Swamp Oak	<i>Casuarina glauca</i>	Mature	15	4	440						440	500	Good	Fair	Medium	2. Medium	A1	5.3	2.5	Asymmetric crown shape.
92	Swamp Oak	<i>Casuarina glauca</i>	Mature	17	4	590						590	710	Good	Good	High	1. Long	AA1	7.1	2.9	None.
93	Tallowood	<i>Eucalyptus microcorys</i>	Semi-mature	9	2.5	230						230	260	Good	Fair	Medium	1. Long	A1	2.8	1.9	Asymmetric crown shape.
94	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	5	2	120	110					163	230	Good	Fair	Low	5. Small/Young	Z1	2.0	1.8	Asymmetric crown shape.
95	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	6	1.5	170						170	200	Good	Good	Low	5. Small/Young	Z1	2.0	1.7	None.
96	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	5	2.5	80	90	80	90			170	250	Good	Fair	Low	5. Small/Young	Z1	2.0	1.8	Asymmetric crown shape.
97	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	5	2.5	140	120	70	80			213	290	Good	Fair	Low	5. Small/Young	Z1	2.6	2.0	Asymmetric crown shape.
98	Chinese Elm	<i>Ulmus parviflora</i>	Semi-mature	6	3	230						230	260	Good	Good	Medium	1. Long	A1	2.8	1.9	Asymmetric crown shape.
99	River She Oak	<i>Casuarina cunninghamiana</i>	Mature	12	3	380						380	450	Good	Good	Medium	1. Long	A1	4.6	2.4	None.
100	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	5	1.5	120						120	140	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
101	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	6	2	160						160	180	Good	Fair	Low	5. Small/Young	Z1	2.0	1.6	Asymmetric crown shape.
102	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	5	1.5	140						140	160	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape.
103	Swamp Oak	<i>Casuarina glauca</i>	Mature	12	2.5	380						380	440	Good	Good	Medium	1. Long	A1	4.6	2.3	None.
104	Swamp Oak	<i>Casuarina glauca</i>	Mature	12	3	410						410	490	Good	Good	Medium	1. Long	A1	4.9	2.5	None.
105	Swamp Oak	<i>Casuarina glauca</i>	Mature	13	3	410						410	470	Good	Fair	Medium	1. Long	A1	4.9	2.4	Asymmetric crown shape.
106	Swamp Oak	<i>Casuarina glauca</i>	Semi-mature	9	2.5	210						210	230	Good	Fair	Medium	2. Medium	Z10	2.5	1.8	Asymmetric crown shape and suppressed form.
107	Swamp Oak	<i>Casuarina glauca</i>	Mature	12	3	360						360	400	Good	Fair	Medium	1. Long	A1	4.3	2.3	Asymmetric crown shape.
108	Swamp Oak	<i>Casuarina glauca</i>	Mature	13	3	340						340	390	Good	Fair	Medium	1. Long	A1	4.1	2.2	Asymmetric crown shape.
109	Swamp Oak	<i>Casuarina glauca</i>	Mature	10	3	260						260	330	Good	Fair	Medium	2. Medium	Z10	3.1	2.1	Asymmetric crown shape.
110	Swamp Oak	<i>Casuarina glauca</i>	Semi-mature	8	2.5	230						230	250	Good	Fair	Medium	2. Medium	Z10	2.8	1.8	Asymmetric crown shape.
111	Swamp Oak	<i>Casuarina glauca</i>	Mature	12	3	270						270	350	Good	Fair	Medium	1. Long	A1	3.2	2.1	Asymmetric crown shape.
112	Swamp Oak	<i>Casuarina glauca</i>	Mature	12	3	300						300	340	Good	Fair	Medium	2. Medium	A1	3.6	2.1	Asymmetric crown shape.
113	Swamp Oak	<i>Casuarina glauca</i>	Mature	13	4	360	370					516	740	Good	Good	Medium	1. Long	A1	6.2	2.9	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	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
114	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Young	4	2	70	40					81	140	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Cavity at base of trunk.
115	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	210	170					270	250	Good	Fair	Medium	2. Medium	Z10	3.2	1.8	Asymmetric crown shape.
116	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	190						190	220	Good	Good	Medium	1. Long	A1	2.3	1.8	None.
117	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	8	3	190	90					210	280	Good	Good	Medium	1. Long	A1	2.5	1.9	None.
118	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	180						180	200	Good	Good	Medium	1. Long	A1	2.2	1.7	None.
119	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	8	3	200	190					276	290	Good	Fair	Medium	2. Medium	A1	3.3	2.0	Asymmetric crown shape.
120	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	170	70					184	250	Good	Fair	Medium	2. Medium	Z10	2.2	1.8	Asymmetric crown shape.
121	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	8	3	200						200	220	Good	Good	Medium	1. Long	A1	2.4	1.8	None.
122	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	5	2	120						120	130	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape.
123	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	4	2	110						110	130	Fair	Fair	Low	5. Small/Young	Z1	2.0	1.5	Significant trunk lean.
124	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	2	130						130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
125	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	5	1	80						80	90	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Trunk in contact with wall.
126	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	2.5	170						170	200	Fair	Fair	Low	2. Medium	Z10	2.0	1.7	Asymmetric crown shape.
127	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	6	1	70						70	90	Fair	Fair	Low	5. Small/Young	Z10	2.0	1.5	Significant trunk lean.
128	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	6	2	130						130	140	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape.
129	Umbrella	<i>Schefflera actinophylla</i>	Semi-mature	9	2.5	210						210	260	Good	Good	Low	2. Medium	Z3	2.5	1.9	Exempt species.
130	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	4	1.5	110						110	130	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
131	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	4	1	100						100	120	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
132	Narrow Leaved Ironbark	<i>Eucalyptus crebra</i>	Mature	25	6	430						430	540	Good	Fair	High	1. Long	AA2	5.2	2.6	Primary branch removed at 6m.
133	Narrow Leaved Ironbark	<i>Eucalyptus crebra</i>	Mature	24	6	410						410	480	Good	Good	High	1. Long	AA1	4.9	2.4	None.
134	Narrow Leaved Ironbark	<i>Eucalyptus crebra</i>	Mature	20	6	390						390	450	Good	Good	High	1. Long	AA1	4.7	2.4	None.
135	Lilly Pilly	<i>Syzygium spp</i>	Semi-mature	5	1.5	130						130	140	Fair	Fair	Low	3. Short	Z4	2.0	1.5	Low foliage density for species.
136	Lilly Pilly	<i>Syzygium spp</i>	Semi-mature	7	2	210						210	240	Good	Good	Medium	1. Long	A1	2.5	1.8	None.
137	Lilly Pilly	<i>Syzygium spp</i>	Semi-mature	7	2	190						190	210	Good	Fair	Medium	2. Medium	Z10	2.3	1.7	Asymmetric crown shape.
138	Lilly Pilly	<i>Syzygium spp</i>	Semi-mature	6	1.5	120						120	140	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Asymmetric crown shape.
139	Lilly Pilly	<i>Syzygium spp</i>	Semi-mature	5	1.5	90						90	110	Fair	Fair	Low	5. Small/Young	Z1	2.0	1.5	None.
140	Blue Jacaranda	<i>Jacaranda mimosifolia</i>	Mature	9	4	310	200					369	380	Good	Fair	Medium	2. Medium	Z11	4.4	2.2	Asymmetric crown shape, main area of crown in contact with
141	Chinese Hackberry	<i>Celtis sinensis</i>	Semi-mature	5	1	80						80	100	Good	Good	Low	5. Small/Young	Z3	2.0	1.5	Exempt species.
142	African Olive	<i>Olea europaea subsp. cuspidata</i>	Mature	8	3.5	260	140	150				331	300	Fair	Fair	Low	2. Medium	Z3	4.0	2.0	Exempt species.
143	Sydney Blue Gum	<i>Eucalyptus saligna</i>	Semi-mature	13	3	290						290	330	Good	Fair	Medium	2. Medium	A2	3.5	2.1	Asymmetric crown shape, possibly caused by previous failure in upper crown.
144	Common or Black Mulberry	<i>Morus nigra</i>	Mature	7	3	310	270					411	460	Fair	Fair	Medium	3. Short	Z4	4.9	2.4	Reduced foliage density for species.
145	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	5	2	130	130					184	240	Good	Fair	Low	5. Small/Young	Z1	2.2	1.8	Co-dominant stems that twist around each other.
146	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	5	2	130	110	110				203	220	Good	Good	Low	5. Small/Young	Z1	2.4	1.8	None.
147	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	170	130	140				256	240	Good	Good	Medium	1. Long	A1	3.1	1.8	None.
148	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	150	160					219	210	Good	Fair	Medium	2. Medium	A1	2.6	1.7	Co-dominant stems near base with included bark at union.
149	Weeping Bottlebrush	<i>Callistemon viminalis</i>	Semi-mature	6	3	170	160	140				272	330	Good	Good	Medium	2. Medium	A1	3.3	2.1	None.
150	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	6	3	260						260	250	Good	Fair	Medium	2. Medium	A1	3.1	1.8	Asymmetric crown shape.
151	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	200	140	150				287	310	Good	Fair	Medium	2. Medium	A1	3.4	2.0	Asymmetric crown shape.
152	River She Oak	<i>Casuarina cunninghamiana</i>	Mature	13	6	720						720	810	Good	Good	High	1. Long	AA1	8.6	3.0	None.
153	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	6	3	170	130					214	290	Fair	Fair	Medium	2. Medium	Z10	2.6	2.0	Asymmetric crown shape. Suppressed by adjacent tree.

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	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
154	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	6	3	180						180	210	Good	Fair	Medium	2. Medium	Z10	2.2	1.7	Asymmetric crown shape due to heavy pruning away from building on adjoining site.
155	Chinese Hackberry	<i>Celtis sinensis</i>	Mature	10	4	340						340	390	Good	Fair	Low	2. Medium	Z3	4.1	2.2	Exempt species. Asymmetric crown shape due to heavy pruning away from building on adjoining site.
156	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	5	2	180	100					206	230	Fair	Fair	Low	2. Medium	Z10	2.5	1.8	Suppressed by adjacent tree.
157	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	7	3	200	170					262	310	Fair	Fair	Medium	2. Medium	Z10	3.1	2.0	Asymmetric crown shape due to heavy pruning away from adjoining site.
158	Black Tea Tree	<i>Melaleuca bracteata</i>	Semi-mature	4	2.5	170						170	200	Good	Fair	Low	2. Medium	Z10	2.0	1.7	Asymmetric crown shape due to heavy pruning away from building on adjoining site.
159	Mexican Fan Palm	<i>Washingtonia robusta</i>	Mature	11	1.5	340						340	N/A	Good	Good	Medium	1. Long	A1	2.5	N/A	None.
160	Canary Palm	<i>Phoenix canariensis</i>	Mature	8	1.5	480						480	N/A	Fair	Fair	Medium	3. Short	A2	2.5	N/A	Significant dieback and wilting of fronds, possibly caused by fusarium wilt.
161	Illawara Flame	<i>Brachychiton acerifolius</i>	Mature	12	3	370						370	420	Fair	Good	Medium	2. Medium	A2	4.4	2.3	Reduced foliage density for species.
162	Robinia	<i>Robinia pseudoacacia</i>	Mature	11	4	490						490	560	Fair	Fair	Medium	3. Short	Z4	5.9	2.6	Apical dieback, approximately 10-15% of upper crown dead.
163	Robinia	<i>Robinia pseudoacacia</i>	Mature	12	4	320						320	370	Good	Fair	Medium	2. Medium	Z10	3.8	2.2	Trunk skews towards site at 1m and leans into site, the whole of the crown is located within the development site.
164	Illawara Flame	<i>Brachychiton acerifolius</i>	Mature	10	2	240						240	270	Good	Fair	Medium	2. Medium	A1	2.9	1.9	Trunk skews at 3m.
165	Canary Palm	<i>Phoenix canariensis</i>	Mature	7	3	520						520	N/A	Good	Good	Medium	1. Long	A1	4.0	N/A	None.
166	Illawara Flame	<i>Brachychiton acerifolius</i>	Mature	9	3	310						310	360	Good	Good	Medium	1. Long	A1	3.7	2.2	None.
167	Lemon Scented Tea Tree	<i>Leptospermum petersonii</i>	Semi-mature	8	1	140						140	180	Fair	Fair	Low	3. Short	Z10	2.0	1.6	Asymmetric crown shape and suppressed form.
168	Elm	<i>Ulmus spp</i>	Mature	15	5	430						430	490	Good	Fair	Medium	1. Long	A1	5.2	2.5	Co-dominant stems at 1.5m, union appears stable.
169	Robinia	<i>Robinia pseudoacacia</i>	Mature	10	5	400	270					483	690	Good	Fair	Medium	2. Medium	A1	5.8	2.8	Asymmetric crown shape. Co-dominant stems near base that twist around each other.
170	Port Jackson Fig	<i>Ficus rubiginosa</i>	Semi-mature	9	3	310						310	350	Good	Fair	Medium	2. Medium	Z11	3.7	2.1	Growing around trunk of tree 171 and will not be retainable if tree is removed.
171	Robinia	<i>Robinia pseudoacacia</i>	Mature	8	3	440						440	510	Fair	Fair	Medium	4. Remove	Z5	5.3	2.5	Trunk leans significantly towards site and whole crown overhangs site. Previous failure on upper side of trunk has caused significant wound at location of increased force due to trunk shape.
172	Chinese Hackberry	<i>Celtis sinensis</i>	Semi-mature	4	2	110	90					142	180	Good	Fair	Very Low	1. Long	Z3	2.0	1.6	Exempt species.
173	Dead Tree	<i>Dead Tree</i>	Dead	7	2	190						190	220	Poor	Poor	Very Low	4. Remove	ZZ4	2.3	1.8	None.
174	Silky Oak	<i>Grevillea robusta</i>	Semi-mature	16	4	330						330	380	Good	Good	Medium	1. Long	A1	4.0	2.2	None.
175	Eucalypt Species	<i>Eucalyptus spp</i>	Mature	15	3.5	320						320	360	Good	Good	High	1. Long	A1	3.8	2.2	None.
176	Grey Gum	<i>Eucalyptus punctata</i>	Semi-mature	12	3	270						270	340	Good	Fair	Medium	2. Medium	A1	3.2	2.1	Asymmetric crown shape.
177	Moreton Bay Fig	<i>Ficus macrophylla</i>	Mature	24	15	4100						4100	4100	Good	Fair	Very High	1. Long	AA4	15.0	6.0	Bark inclusions at several major stem and branch unions, common for species.
178	Unknown Species	<i>Unknown spp</i>	Semi-mature	4	1	110						110	120	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
179	Grey Gum	<i>Eucalyptus punctata</i>	Semi-mature	7	2	130						130	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
180	Grey Gum	<i>Eucalyptus punctata</i>	Mature	14	3.5	300						300	340	Good	Fair	High	1. Long	A1	3.6	2.1	Minor wounds at base of trunk.
181	Robinia	<i>Robinia pseudoacacia</i>	Mature	8	4	290						290	330	Good	Fair	Medium	2. Medium	Z10	3.5	2.1	Asymmetric crown shape and significant trunk lean.
182	Grey Gum	<i>Eucalyptus punctata</i>	Mature	18	6	530						530	600	Fair	Good	High	2. Medium	A2	6.4	2.7	Reduced foliage density for species.
183	Grey Gum	<i>Eucalyptus punctata</i>	Mature	16	4	410						410	460	Fair	Fair	High	2. Medium	A2	4.9	2.4	Reduced foliage density for species. Asymmetric crown shape and trunk lean away from site.

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	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
184	Grey Gum	<i>Eucalyptus punctata</i>	Semi-mature	6	1.5	140						140	160	Good	Fair	Low	5. Small/Young	Z1	2.0	1.5	Co-dominant stems at 3m.
185	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	8	2	140						140	150	Fair	Fair	Medium	2. Medium	Z1	2.0	1.5	Reduced foliage density for species. Asymmetric crown shape.
186	Callitris Species	<i>Callitris spp</i>	Semi-mature	4	1	120						120	150	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	Callitris
187	Queensland Brushbox	<i>Lophostemon confertus</i>	Mature	14	6	670						670	750	Good	Fair	High	1. Long	A1	8.0	2.9	Minor trunk lean towards site. Crown pruned away from building.
188	Port Jackson Fig	<i>Ficus rubiginosa</i>	Mature	22	7	1220						1220	1350	Good	Fair	Very High	2. Medium	AA4	14.6	3.8	Decay/cavity at base of trunk. Probed and decay does not appear likely to compromise cross section of trunk on t/r method. However, heartwood sounds hollow when probed and it is possible decay within heartwood is more significant than probing indicates.
189	Tallowood	<i>Eucalyptus microcorys</i>	Mature	24	6	670						670	780	Good	Fair	High	1. Long	AA2	8.0	3.0	Co-dominant stems at 11m, union appears stable. Significant diameter deadwood above footpath.
190	Tallowood	<i>Eucalyptus microcorys</i>	Mature	24	4	420						420	510	Good	Fair	High	2. Medium	A2	5.0	2.5	Trunk skews towards site at 1m. Asymmetric crown shape, weighted towards site. Significant diameter deadwood above footpath.
191	Spotted Gum	<i>Corymbia maculata</i>	Mature	16	4	280						280	320	Good	Good	High	1. Long	A1	3.4	2.1	None.
192	Swamp Oak	<i>Casuarina glauca</i>	Mature	17	5	520						520	610	Good	Good	High	1. Long	AA1	6.2	2.7	None.
193	Tallowood	<i>Eucalyptus microcorys</i>	Mature	20	7	590						590	680	Good	Fair	High	1. Long	AA1	7.1	2.8	Co-dominant stems at 4m, union appears stable.
194	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	10	2	320						320	N/A	Good	Good	Low	2. Medium	Z3	3.0	N/A	Exempt species. Located in adjoining site, not tagged and DBH estimated. Located above significant retaining wall.
195	Orange Jessamine	<i>Murraya paniculata</i>	Mature	6	1.5	100	70					122	150	Good	Good	Low	2. Medium	Z1	2.0	1.5	None.
196	Orange Jessamine	<i>Murraya paniculata</i>	Mature	6	1.5	90	50	50				114	140	Good	Good	Low	2. Medium	Z1	2.0	1.5	None.
197	Lilly Pilly	<i>Syzygium smithii</i>	Young	6	1	80	50					94	110	Poor	Fair	Low	4. Remove	Z4	2.0	1.5	Apical dieback.
198	Lilly Pilly	<i>Syzygium smithii</i>	Young	5	1	100						100	120	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
199	Lilly Pilly	<i>Syzygium smithii</i>	Young	5	1	100						100	110	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
200	Lilly Pilly	<i>Syzygium smithii</i>	Young	5	1	90						90	110	Good	Good	Low	5. Small/Young	Z1	2.0	1.5	None.
201	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	12	2	330						330	N/A	Good	Good	Low	2. Medium	Z3	3.0	N/A	Exempt species.
202	Cocos Palm	<i>Syagrus romanzoffiana</i>	Mature	12	2	310						310	N/A	Good	Good	Low	2. Medium	Z3	3.0	N/A	Located in adjoining site, not tagged and DBH estimated. Exempt species.
63a	Orange Jessamine	<i>Murraya paniculata</i>	Semi-mature	5	2	200						200	240	Good	Good	Low	5. Small/Young	Z1	2.4	1.8	Located in courtyard and no access at time of inspection. Not tagged and DBH estimated.

Explanatory Notes

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

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

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

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

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

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

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

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

Health - Good/Fair/Poor/Dead

Structure - Good/Fair/Poor

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

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

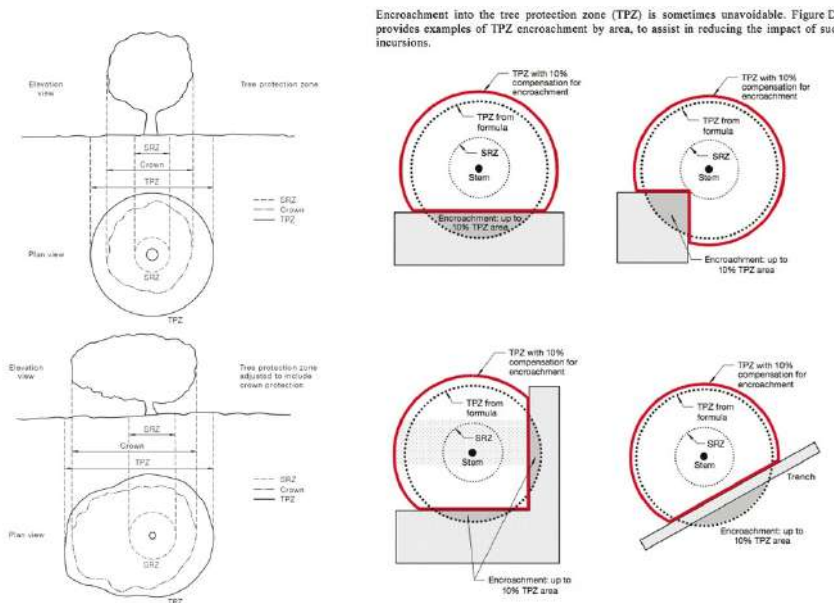
Retention Value: Tree AZ, see appendix 3 for categories.

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.

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

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.
 - 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.

<u>Category</u>	<u>Example condition</u>	<u>Summary</u>
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. • Trees that have a life expectancy 40 or more years. 	<ul style="list-style-type: none"> • The tree is in average or above average health and condition and no remedial works are required except general maintenance.
Fair	<ul style="list-style-type: none"> • The tree may be starting to dieback or have over up to 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 signs of infection pathogens which may further deteriorate the health of the tree. • There may be epicormic growth indicating increased levels of stress within the tree. • Trees that may only live between 15 and 40 more years 	<ul style="list-style-type: none"> • The tree is in below average health and vigour and may require remedial works to improve the trees health.
Poor	<ul style="list-style-type: none"> • The may be in decline, have extensive dieback or have over 25% 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. • Trees that have useful life expectancy of less than 5 years. 	<ul style="list-style-type: none"> • The tree is displaying low levels of health and remedial action are unlikely to be sufficient to improve the health of the tree.
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.

<u>Category</u>	<u>Example condition</u>	<u>Summary</u>
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. • Trees that have a life expectancy 40 or more years. 	<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 structural defects. • The identified defects could potentially develop into more significant defects. • The tree may a cavity that is currently unlikely to fail but may deteriorate in the future. • The tree is an unbalanced shape or leans significantly. • The tree may have minor damage to its roots. • The root plate may have moved in the past but the tree has now compensated for this. • Branches may be rubbing or crossing. • The tree may have suppressed form. • Trees that may only live between 15 and 40 more years 	<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.

<p>Poor</p>	<ul style="list-style-type: none"> • The tree has significant structural defects that cannot be alleviated. • 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. • Trees that have useful life expectancy of less than 5 years. 	<ul style="list-style-type: none"> • The identified defects are likely to cause either partial or whole failure of the tree and cannot be alleviated.
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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 size/dimensions of the tree.
 - The visibility of the tree to adjacent sites and visual prominence of the tree.
 - The age, growth rate and longevity of the tree.
 - The relationship between the tree and the site, including heritage and biodiversity status, or cultural/commentative trees.
 - Whether the tree is protected by any statutory conditions.
 - Whether tree is native, locally occurring or exotic.
 - The habitat value of the tree.
 - Whether the tree is considered a noxious weed or exempt 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 40mm 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, such as manual excavations or ground penetrating radar (GPR). Any excavations for the root investigations must 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
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
- Z5 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
- 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.

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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 tree's 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

Extract from Stantec infrastructure report indicating potential service redirection required

6.2 Sewer

DBYD plans have indicated Sydney Water, sewer assets within proximity to the subject site.

Potential electrical grid line to be diverted along the inside of the basement shoring wall

Sewer line to be diverted along the inside of the adjacent basement shoring wall where constrained by tree protection zones and spacial restrictions

Indicative basement footprint shown in blue hatch

Note that all services diversions that are contained within the basement footprint will required temporary service connections whilst the basement construction is taking place.

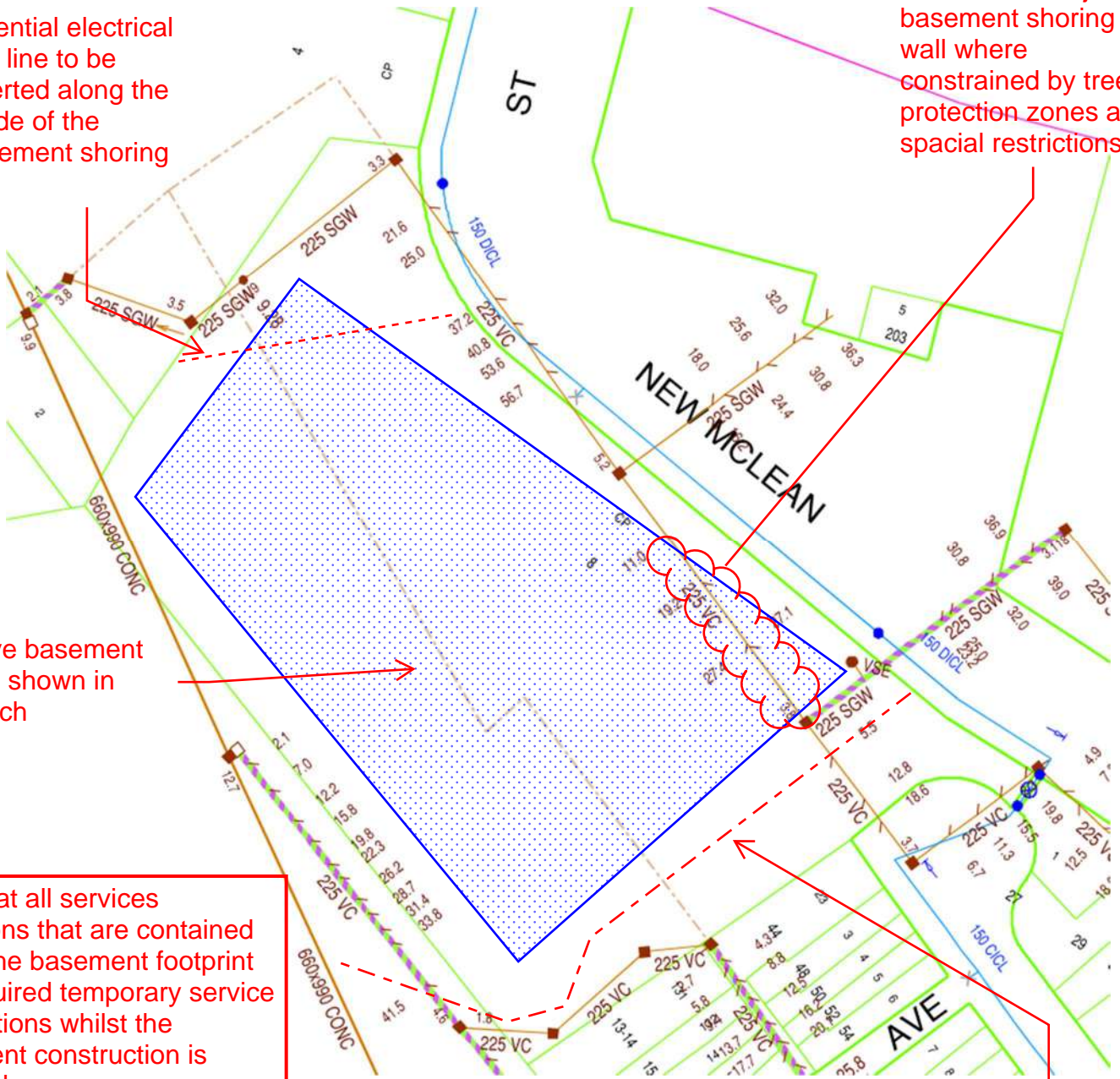


Figure 6.2

Existing Stormwater line sits outside basement footprint

This includes the following;

- Ø225 Sydney Water sewer main located within the site along the Northern boundary.
- Ø225 Sydney Water sewer main located within the site along the Western boundary.
- Ø225 Sydney Water sewer main located within the site along the Eastern boundary.
- Ø225 & Ø600 x Ø900 Sydney Water sewer main located within the site along the Southern boundary.



6.2.1 Existing Sewer Infrastructure

Existing Infrastructure The Sewer Authority for the area is Sydney Water. The site has access to existing sewer mains situated along all boundaries. The Ø225 VC sewer main is reticulating through the site along the North, West and East Boundaries. Refer to Figure 6.2 for existing sewer infrastructure.

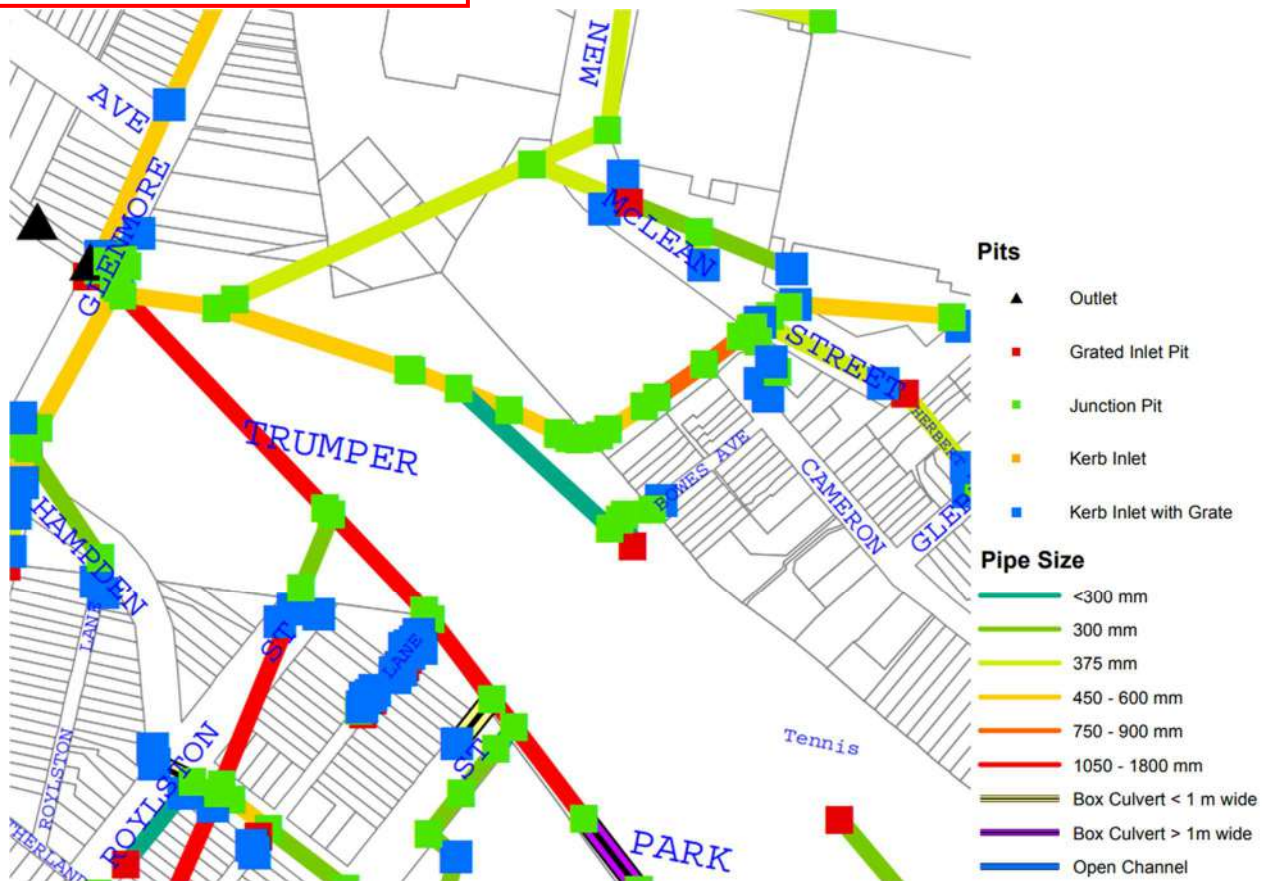
We anticipate that 2 x Ø225 sewer main connections will be required to service the development. It is expected that the Ø225 sewer main that extends along the Southern boundary to have sufficient capacity to service the development. We anticipate a secondary connection to the Ø225 sewer along the Western boundary to have sufficient capacity to service the development. We anticipate the above connection be most suitable point of connection for the development. The existing sewer mains would be within the building footprint of parts of the development and will require argumentation to be diverted around the building. This information is preliminary only and is subject to discussions with Sydney Water. Any advice from the Sydney Water coordinator during the section 73 application process will override the above preliminary information.

Critical Issue – Existing authority sewer main is located within the proposed development footprint. This sewer main services the surrounding residential properties and will be required to be diverted around the building footprint. Sydney Water may also deem other assets within close proximity to the building footprint to be at risk and require augmentation or protection. A water services coordinated will be required to develop a design. Refer to figure 6.2.2 for preliminary information.



Figure 6.2.2

Extract from Stantec infrastructure report indicating potential service diversion required -
STORMWATER



Existing Stormwater Infrastructure (Source: Rushcutters Bay Flood Study)



Existing Stormwater Infrastructure Capacity (Source: Rushcutters Bay Flood Study)

