Tree Audit and Risk Assessment Report

Ormond College

49 College Cres, Parkville

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Submitted
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Executive Summary

A total of 206 individual trees or groups of trees located within the boundaries of Ormond College were assessed for this report. The main findings of the assessment were:

- The trees are generally in good to fair health, with most trees presenting with dense canopies and good leaf size and colour.
- While structure of the trees is generally fair and most trees present with strong and open branch and stem attachments; over one quarter of the trees present with some form of structural defect.
- Over one third of the trees onsite have a ULE less than 15 years. This is mainly due to mature trees with structural defects and trees in poor health. Although a number of trees will eventually require removal due to their structural defects, the ULE of the trees on the site can be improved through proactive formative pruning works and health treatments.
- The risk assessment found that most trees assessed pose a broadly acceptable level of risk.
- Twenty-nine trees require maintenance works within the next 12 months (high priority). The trees may not pose an immediate threat but may contain unacceptable defects or hazards given the level of pedestrian traffic. The works include remedial pruning, deadwood removal, aerial inspections, broken branch removal, cable bracing, and tree removal.
- Forty-nine trees require tree health treatments. It is best practice to proactively improve the health of trees onsite as some trees may not recover when their health deteriorates.

A budget should be allocated each year to service proactive rather than reactive tree maintenance. Proactive tree maintenance is shown to be more cost effective by mitigating risk early and prolonging the useful life of the urban forest.

A follow up site visit to meet with the property manager is recommended. This is to cover the main points of the report so a strategic management plan can be put in place

Document Control

Table 1. Document Control

Version	Author	Date	Amendment
1	Matthew P James	27/02/2025	Null

Background

Melbourne Tree Care was contracted to produce a survey and risk assessment report for trees located within the boundaries and surrounds of Ormond College. The survey has been commissioned to create an accurate list of trees on the property, to be used as a database for long-term record keeping, budgeting and maintenance history of each tree.

Aim of Report

- Identify all trees on the site and trees that are likely to impact the site, with data detailing their current size (DBH, crown spread, height), condition, ULE (useful life expectancy) and position within the urban forest.
- Conduct a risk assessment on each tree assessed.
- Identify any pests or diseases that may impact the trees on site.
- Prioritise maintenance schedules in order to reduce the potential liability that results from hazardous trees. It also streamlines the efficiency of tree crews and facilitates long-term budgeting.
- Detail management and maintenance requirements to maintain a healthy urban forest into the future with an acceptable amount of risk.
- Demonstrate a higher level of accountability in tree management to stakeholders.

Methodology

- Matthew P James of Melbourne Tree Care attended site on the 19th of February 2025.
- Data acquired is based on a Visual Tree Assessment (VTA) from the ground (Mattheck and Breloer, 1994).
- All trees within the subject site with a mature height greater than five metres were assessed.

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- Data collected for each tree was their current size (DBH, crown spread, height), condition (health and structure), ULE (useful life expectancy), and Tree Protection Zone (TPZ).
- All measurements are estimates.
- Risk assessments were undertaken using the Quantified Tree Risk Assessment (QTRA) method.
- Tree locations are approximates based on aerial imagery.
- Data was recorded using Tree Plotter.

Planning Controls

The subject site is located in the City of Melbourne Public Use Zone – Education (PUZ2). Three planning overlays are present:

- Design and Development Overlay – Schedule 66 (DDO66)
- Environmental Significance Overlay – Schedule 2 (ESO2)
- Heritage Overlay – Schedule (HO323)

Vegetation Controls

Five trees within Ormond College are listed in the City of Melbourne's Exceptional Tree Register (2019). A permit is required to remove these trees:

- Tree 45 *Corymbia haematoxylon* (Lesser Bloodwood)
- Trees 92, 93, 97 *Sequoia sempervirens* (Coast Redwood)
- Tree 134 *Eucalyptus camaldulensis* (River Red Gum)

The subject site is greater than 4,000 m^2, triggering clause 52.17 of the Victorian Planning Scheme. Pursuant to clause 52.17, a permit is required to remove, destroy, or lop native vegetation. There is an exemption within the clause that states a permit is not required when:

- *Lopping or pruning native vegetation, for maintenance only, provided no more than 1/3 of the foliage of each individual plant is lopped or prune;*
- *Native vegetation that is to be removed, destroyed or lopped that was either planted or grown as a result of direct seeding. This exemption does not apply to native vegetation planted or managed with public funding for the purpose of land protection or enhancing biodiversity unless the removal, destruction or lopping of the native vegetation is in accordance with written permission of the agency (or its successor) that provided the funding.*

Before the removal of any vegetation, it is best practice to contact and confirm works with local government.

Observations and Discussion

A total of 206 individual trees or groups of trees were assessed for this report (Figure 1). See **Appendix A** for tree locations. Detailed observations for individual trees are listed in **Appendix B** and see **Appendix C** for glossary of terms.

Figure 1. Site overview and tree locations

Tree Population Overview

The trees assessed are mature (48% of the tree population), semi mature (47%) and juvenile (5%) in age. The trees are a mix of exotic (57%), Australian native (31%), and Victorian native (12%) species. The tree population is comprised of over 80 different species, with *Ulmus sp.* (Elm) the most extensively planted genus onsite. A number of species could only be identified to a genus level due to a lack of identifiable features (leaves, flowers, fruit).

Health

The health of the trees is assessed as good (44%), fair (40%), and poor (16%). Most trees are presenting with good leaf size, colour, and crown density; all of which are indicators of good vigour and vitality (Shigo, 1991).

The large River Red Gum (Tree 134) has declined over the past three years due to an extensive sap sucking pest (Psyllid) attack (Figure 2). Soil treatments containing silicate, which have been found to be an effective non-pesticide control for sap suck pests (de Queiroz et al., 2016), have been carried out over the past three years. The health of the tree has improved since the treatments (Figure 3); however, the tree will require annual treatments to improve the vigor and vitality of the tree.

Figure 2. Tree 134 was in decline, with a thin canopy, dieback, and extensive Psyllid attack (photo taken 22/12/2022)

Figure 3. The health of Tree 134 has improved since soil treatments have been carried out. (photo taken 18/2/2025)

The three large Coast Redwoods (trees 92, 93, 97) are showing signs of stress, with discolouration (chlorosis) of the needles in the lower canopies (Figure 4 and Figure 5). This suggests there may be a chemical imbalance in the soil (Costello et al., 2003). Soil leaf samples should be collected from each tree and sent for analysis to determine the cause. A tree health program can then be formulated and implemented to ensure the health of these significant trees improves.

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Figure 4. Tree 92 is showing signs of trees with needle chlorosis on the lower canopy.

Figure 5. Needle chlorosis on Tree 97.

Structure

The structure of the trees is assessed fair (67%), poor (26%), and good (7%). While most trees assessed present with strong stem and branch attachments and are generally free of above ground defects, 54 trees present with poor structure and may require remedial pruning or removal within the next five years.

Useful Life Expectancy

The attributes taken into consideration when determining tree useful life expectancy (ULE) are tree condition (combination of health & structure), species, age, and location. Over one third of the trees onsite (37%) have a ULE less than 15 years. This is mainly due to mature trees with structural defects and trees in poor health. Although a number of trees will eventually require removal due to their structural defects, the ULE of the trees on the site can be improved through proactive formative pruning works and health treatments.

Risk Assessment

The Quantified Tree Risk Assessment (QTRA) system developed by Mike Ellison (2005) was used to carry out a risk assessment. All assessments are valid for 12 months. See **Appendix D** for QTRA methodology.

The method uses:

- Target
- Size of part
- Probability of failure within the next 12 months

Target x **size of part** x **probability of failure=RoH** (Risk of Harm)

The majority of the trees (80%) are assessed as having a RoH that is less than 1/1,000,000, which is Broadly Acceptable and is already ALARP (as low as reasonably practicable). While these trees have low RoH, tree maintenance is still recommended to ensure the structural defects are proactively mitigated.

Twenty-eight trees have been assessed as having a RoH in the tolerable region of the risk threshold, however risk mitigation works may be recommended in the next 12-36 months to reduce the likelihood of failure.

Thirteen trees were assessed as having a RoH below the 1/100,000 threshold. Although this level of risk is in the tolerable region of the risk threshold, risk mitigation works are required in the next 12 months to reduce the likelihood of failure.

Table 2. Risk Assessment

RoH	No. of Trees
1/30,000	5
1/50,000	7
1/100,000	1
1/300,000	5
1/500,000	16
1/1,000,000	7
<1/1,000,000	165

Recommendations

Detailed recommendations for individual trees are listed in **Summary of Works** and **Appendix B**. Recommendations take into account safety of staff, students and visitors and then relate to a strategy for the long-term management of the site. Annual audits are recommended to document any changes in the health and structure of the trees on site.

All works should be carried out by suitably qualified persons (minimum AQF III), and be in accordance with Australian Standard 4373-2007 *Pruning of amenity trees*. Aerial inspections should be carried out by suitably qualified persons (minimum AQF V).

Summary of Works

Table 3. Work Priority

Priority	Total
Urgent	0
High	29
Medium	27
Low	32
Tree Health	49
Asset Management	15

Urgent Priority

Plan to complete these works **immediately:** these trees pose a threat to people or property.

No trees require urgent works.

High Priority

Plan to complete these works in the next 12 months (February 2026): trees may not pose immediate threat but may contain unacceptable defects or hazards for the level of pedestrian traffic.

There are **29 trees** that require work within the next 12 months.

Table 4. High Priority Works

Tree Id	Botanical Name	Recommended Works	RoH
11	*Ulmus sp.*	Reduce central stem by 20%. Reduce all other stems by 10%	1/30,000
12	*Ulmus sp.*	Reduce entire canopy by 20%.	1/300,000
13	*Ulmus sp.*	Aerial Inspection	1/500,000
14	*Ulmus sp.*	Aerial Inspection, Deadwood	1/30,000
15	*Ulmus sp.*	Aerial Inspection, Deadwood	1/30,000
18	*Ulmus sp.*	Deadwood	1/30,000
29	*Eucalyptus botryoides*	Deadwood	1/500,000
30	*Eucalyptus botryoides*	Deadwood	1/500,000
32	*Ulmus minor*	Deadwood	1/500,000
33	*Ulmus minor*	Reduce southern stem by 30%. Cable brace.	1/500,000
35	*Liquidambar styraciflua*	Cable Brace	1/50,000
36	*Liquidambar styraciflua*	Deadwood	1/50,000
38	*Liquidambar styraciflua*	Deadwood, Reduce southern codominant stem by 30%.	1/50,000
49	*Cedrus deodara*	Deadwood	1/300,000
56	*Fraxinus Raywood*	Deadwood	1/500,000
67	*Acer negundo*	Deadwood	1/50,000
71	*Cupressus sempervirens*	Removal	1/300,000
75	*Hesperocyparis arizonica*	Deadwood	1/30,000
102	*Cercis siliquastrum*	Install prop on southern stem	1/50,000
105	*Lagunaria patersonia*	Aerial Inspection, Inspect cable	<1/1,000,000
107	*Hesperocyparis macrocarpa*	Reduce all extended lateral branches by 20%. Broken Branches	1/500,000
109	*Cupressus torulosa*	Broken Branches	1/500,000
116	*Acer negundo*	Deadwood	1/500,000
124	*Catalpa bignonioides*	Removal	<1/1,000,000
129	*Corymbia citriodora*	Deadwood	1/50,000
130	*Corymbia citriodora*	Deadwood	1/500,000

Tree Id	Botanical Name	Recommended Works	RoH
133	*Eucalyptus sp.*	Install cable on low south west lateral.	1/100,000
146	*Ulmus sp.*	Broken Branches	1/50,000
152	*Jacaranda mimosifolia*	Deadwood	1/500,000

Medium Priority

Plan to address these priorities within 24-36 months (February 2027/2028): while these trees pose no immediate threat, they should not be ignored. Works mostly relate to formative pruning and trees in low target areas. They include trees with observed defects that should be reviewed and monitored. Some works are recommended for general tree health, and their execution will improve the long-term prospects of the trees.

There are **27 trees** that require works within the next 24-36 months.

Table 5. Medium Priority Works

Tree Id	Botanical Name	Recommended Works	RoH
9	*Ulmus sp.*	Removal	1/300,000
23	*Cedrus deodara*	Deadwood, Weight reduce - Whole Tree	<1/1,000,000
31	*Ulmus minor*	Reduction Prune	<1/1,000,000
47	*Eucalyptus tereticornis*	Formative Prune	<1/1,000,000
59	*Eucalyptus gomphocephala*	Weight Reduce	<1/1,000,000
65	*Sophora microphylla*	Reduction Prune	<1/1,000,000
72	*Cedrus deodara*	Weight Reduce	1/500,000
74	*Brachychiton populneus*	Removal	1/300,000
84	*Syzygium paniculatum*	Removal	<1/1,000,000
85	*Syzygium paniculatum*	Removal	<1/1,000,000
88	*Syzygium sp.*	Removal	<1/1,000,000
91	*Syzygium sp.*	Removal	<1/1,000,000
98	*Corymbia ficifolia*	Weight Reduce	<1/1,000,000
99	*Gleditsia triacanthos*	Deadwood	<1/1,000,000
101	*Phoenix canariensis*	Remove dead fronds	<1/1,000,000
103	*Melia azedarach*	Adjust or replace cable.	1/1,000,000
108	*Ficus rubiginosa*	Formative Prune	<1/1,000,000
114	*Jacaranda mimosifolia*	Deadwood	1/500,000
120	*Pittosporum undulatum*	Removal	<1/1,000,000
148	*Eucalyptus sp.*	Removal	<1/1,000,000
164	*Eucalyptus pauciflora*	Formative Prune	<1/1,000,000
166	*Eucalyptus scoparia*	Formative Prune	<1/1,000,000

Tree Id	Botanical Name	Recommended Works	RoH
192	*Corymbia eximia*	Formative Prune	<1/1,000,000
193	*Eucalyptus pauciflora*	Formative Prune	<1/1,000,000
196	*Eucalyptus microcarpa*	Formative Prune	<1/1,000,000
199	*Eucalyptus pauciflora*	Formative Prune	<1/1,000,000
220	*Brachychiton sp.*	Formative Prune	<1/1,000,000

Low Priority

Plan to address these priorities within 5 years (February 2030): these trees pose no immediate threat. They may include trees that require removal in the future where their viability for long-term retention is low and formative pruning.

There are **32 trees** that require works within the next 5 years.

Table 6. Low Priority Works

Tree Id	Botanical Name	Recommended Works	RoH
34	*Fraxinus griffithii*	Formative Prune	<1/1,000,000
50	*Quercus coccinea*	Formative Prune	<1/1,000,000
61	*Corymbia maculata*	Formative Prune	<1/1,000,000
86	*Pittosporum undulatum*	Removal	<1/1,000,000
87	*Syzygium paniculatum*	Formative Prune	<1/1,000,000
127	*Corymbia citriodora*	Formative Prune	<1/1,000,000
128	*Corymbia citriodora*	Formative Prune	<1/1,000,000
135	*Quercus coccinea*	Formative Prune	<1/1,000,000
158	*Eucalyptus mannifera*	Formative Prune	<1/1,000,000
163	*Betula sp.*	Formative Prune	<1/1,000,000
165	*Corymbia maculata*	Formative Prune	<1/1,000,000
168	*Geijera parviflora*	Formative Prune	<1/1,000,000
169	*Corymbia citriodora*	Formative Prune	<1/1,000,000
170	*Corymbia citriodora*	Formative Prune	<1/1,000,000
171	*Corymbia citriodora*	Formative Prune	<1/1,000,000
173	*Corymbia citriodora*	Formative Prune	<1/1,000,000
174	*Corymbia citriodora*	Formative Prune	<1/1,000,000
176	*Eucalyptus caesia 'Silver Princess'*	Formative Prune	<1/1,000,000
177	*Eucalyptus sp.*	Formative Prune	<1/1,000,000
178	*Leptospermum sp.*	Formative Prune	<1/1,000,000
179	*Callistemon sp.*	Formative Prune	<1/1,000,000
181	*Eucalyptus sp.*	Formative Prune	<1/1,000,000
183	*Hakea laurina*	Formative Prune	<1/1,000,000

Tree Id	Botanical Name	Recommended Works	RoH
186	*Eucalyptus pauciflora*	Formative Prune	<1/1,000,000
194	*Eucalyptus pauciflora*	Formative Prune	<1/1,000,000
197	*Corymbia eximia*	Formative Prune	<1/1,000,000
200	*Quercus palustris*	Formative Prune	<1/1,000,000
201	*Quercus palustris*	Formative Prune	<1/1,000,000
202	*Quercus palustris*	Formative Prune	<1/1,000,000
208	*Jacaranda mimosifolia*	Formative Prune, Remove stakes and ties	<1/1,000,000
209	*Jacaranda mimosifolia*	Formative Prune, Remove stakes and ties	<1/1,000,000
221	*N/A*	Formative Prune	<1/1,000,000

Tree Health

Plan to address these where budget allows: these trees pose no immediate threat. Health treatments can include soil testing, soil treatments to remedy toxicities and deficiencies, and pest management. It is best to proactively improve the health of all trees onsite, as trees may not recover when their health deteriorates.

There are **49 trees** that require tree health treatments.

Table 7. Tree Health

Tree Id	Botanical Name	Recommended Works	RoH
2	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
3	*Ulmus sp.*	Tree Health Treatment, ELB treatment	1/500,000
4	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
5	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
6	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
7	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
8	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
11	*Ulmus sp.*	Tree Health Treatment, ELB treatment	1/30,000
13	*Ulmus sp.*	Tree Health Treatment, ELB treatment	1/500,000
14	*Ulmus sp.*	Tree Health Treatment, ELB treatment	1/30,000
15	*Ulmus sp.*	Tree Health Treatment, ELB treatment	1/30,000
16	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
17	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
18	*Ulmus sp.*	Tree Health Treatment, ELB treatment	1/30,000
29	*Eucalyptus botryoides*	Tree Health Treatment	1/500,000
30	*Eucalyptus botryoides*	Tree Health Treatment	1/500,000
36	*Liquidambar styraciflua*	Tree Health Treatment	1/50,000
37	*Liquidambar styraciflua*	Tree Health Treatment	<1/1,000,000

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Tree Id	Botanical Name	Recommended Works	RoH
45	*Corymbia haematoxylon*	Tree Health Treatment	<1/1,000,000
53	*Lophostemon confertus*	Tree Health Treatment	<1/1,000,000
55	*Liquidambar styraciflua*	Tree Health Treatment	<1/1,000,000
63	*Melia azedarach*	Possum Guard	<1/1,000,000
66	*Pseudotsuga menziesii*	Tree Health Treatment	<1/1,000,000
68	*Lophostemon confertus*	Tree Health Treatment	<1/1,000,000
73	*Schinus molle*	Tree Health Treatment	<1/1,000,000
81	*Celtis australis*	Possum Guard	<1/1,000,000
92	*Sequoia sempervirens*	Tree Health Treatment	<1/1,000,000
93	*Sequoia sempervirens*	Tree Health Treatment	<1/1,000,000
97	*Sequoia sempervirens*	Tree Health Treatment	<1/1,000,000
106	*Celtis australis*	Possum Guard	<1/1,000,000
115	*Celtis australis*	Possum Guard	<1/1,000,000
123	*Ulmus minor*	Possum Guard	<1/1,000,000
134	*Eucalyptus camaldulensis*	Tree Health Treatment	<1/1,000,000
141	*Ulmus sp.*	Tree Health Treatment	<1/1,000,000
142	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
143	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
144	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
145	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
146	*Ulmus sp.*	Tree Health Treatment, ELB treatment	1/50,000
147	*Ulmus sp.*	Tree Health Treatment, ELB treatment	<1/1,000,000
151	*Magnolia grandiflora*	Tree Health Treatment	<1/1,000,000
152	*Jacaranda mimosifolia*	Tree Health Treatment	1/500,000
156	*Gleditsia triacanthos*	Possum Guard	<1/1,000,000
167	*Quercus palustris*	Possum Guard	<1/1,000,000
182	*Tristaniopsis laurina*	Tree Health Treatment	<1/1,000,000
185	*Corymbia sp.*	Tree Health Treatment	<1/1,000,000
190	*Eucalyptus scoparia*	Tree Health Treatment	<1/1,000,000
198	*Corymbia eximia*	Tree Health Treatment	<1/1,000,000
211	*Tilia cordata*	Possum Guard	<1/1,000,000

Asset Management

Plan to address these trees when budget allows. These trees may pose no immediate threat. Works mostly relate to asset clearance pruning away from buildings, lights, signs and security cameras, as well as uplift pruning low branches for clearance over roads, footpaths and carparks.

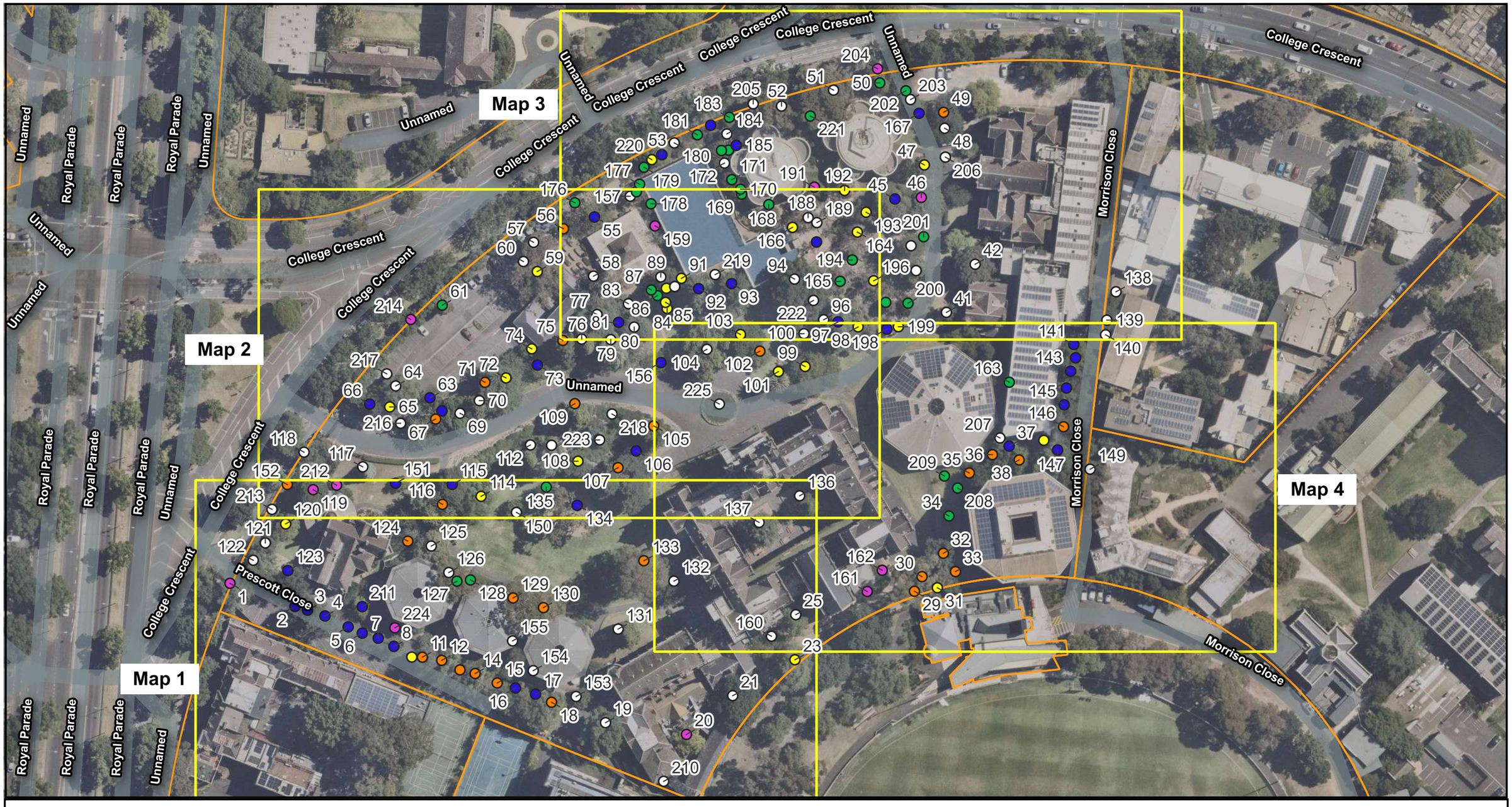
There are **15 trees** that require asset management.

Table 8. Asset Management Works

Tree Id	Botanical Name	Recommended Works	RoH
1	*Schinus molle*	Uplift	<1/1,000,000
2	*Ulmus sp.*	Asset clearance	<1/1,000,000
20	*Catalpa bignonioides*	Asset clearance	<1/1,000,000
46	*Quercus palustris*	Uplift	<1/1,000,000
119	*Syzygium sp.*	Asset clearance	<1/1,000,000
141	*Ulmus sp.*	Asset clearance	<1/1,000,000
143	*Ulmus sp.*	Asset clearance	<1/1,000,000
159	*Eucalyptus caesia 'Silver Princess'*	Asset clearance	<1/1,000,000
161	*Cercis siliquastrum*	Asset clearance	<1/1,000,000
162	*Malus sp.*	Asset clearance	<1/1,000,000
191	*Corymbia eximia*	Asset clearance	<1/1,000,000
204	*Acacia sp.*	Uplift	<1/1,000,000
212	*Olea europaea*	Asset clearance	<1/1,000,000
214	*Pittosporum undulatum*	Uplift	<1/1,000,000
224	*Olea europaea subsp. cuspidata*	Asset clearance	<1/1,000,000

Future Works

Tree populations undergo constant change. As they age, an inventory becomes less accurate and useful. No inventory will provide information that is useful beyond five to seven years. Tree inventory tables should be updated at the completion of tree works to reflect the actions taken and then the site should be reviewed annually to note any changes that warrant attention.



Coordinate Reference System (CRS)
EPSG: 28355 GDA94/MGA Zone 55

Tree locations are approximate

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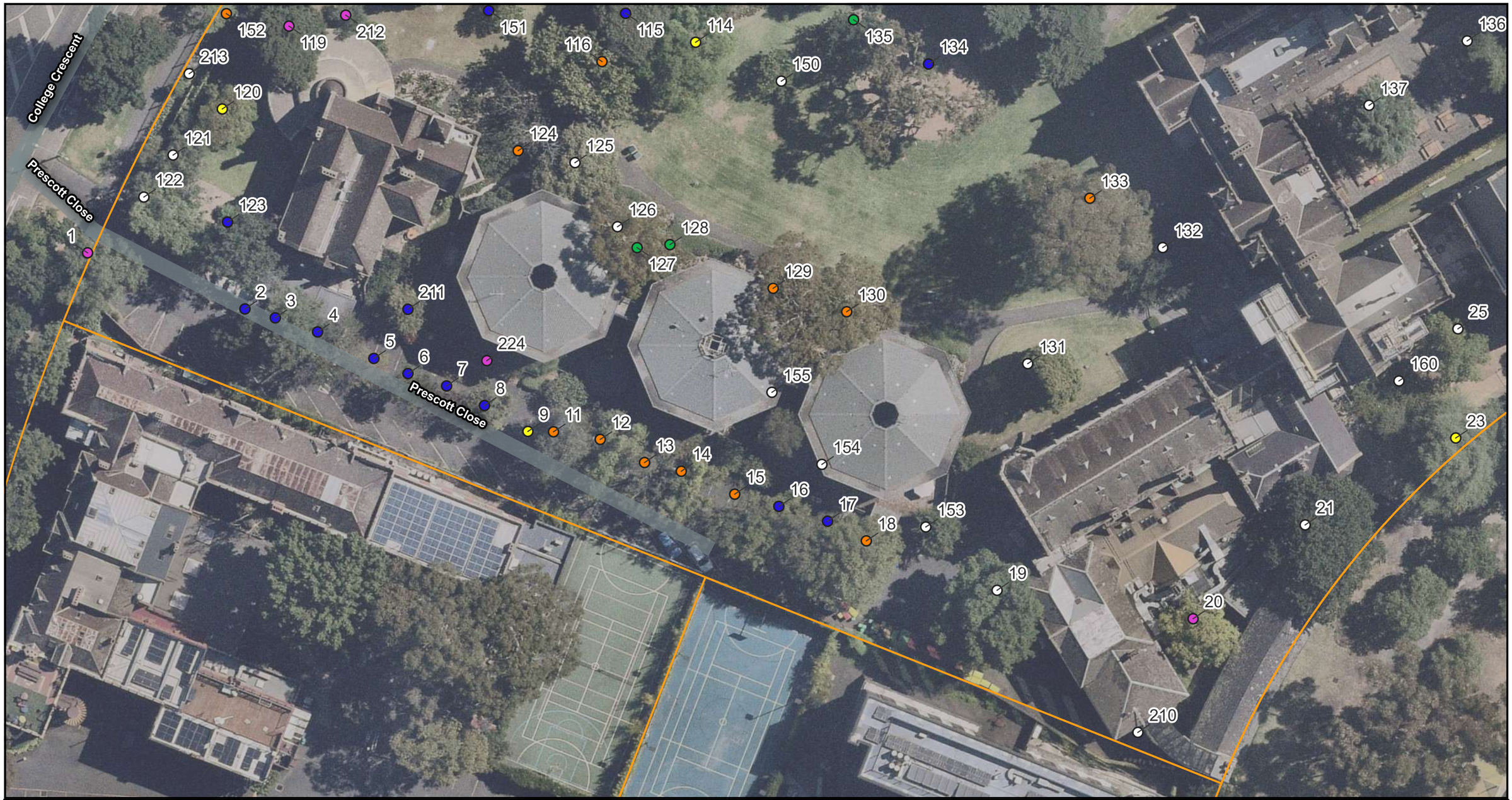
Appendix A: Site overview

N

0 20 40 m

Legend

- Tree
- Cadastre
- Road



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Coordinate Reference System (CRS)
EPSG: 28355 GDA94/MGA Zone 55

Tree locations are approximate

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Appendix A: Map 1

Legend

Work Priority
- High
- Medium
- Low

- Tree Health
- Asset Management
- No works

- Cadastre
- Road

0 10 20 m

N

Coordinate Reference System (CRS)
EPSG: 28355 GDA94/MGA Zone 55

Tree locations are approximate

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Appendix A: Map 2

Legend

Work Priority
- High
- Medium
- Low

- Tree Health
- Asset Management
- No works

- Cadastre
- Road

0 10 20 m


College Crescent
College Crescent
College Crescent
College Crescent
College Crescent
Unnamed
Unnamed
Morrison Close
204
50
51
202
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83
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198
199
103
100
140
76

N

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Appendix A: Map 3

Coordinate Reference System (CRS)
EPSG: 28355 GDA94/MGA Zone 55

Tree locations are approximate

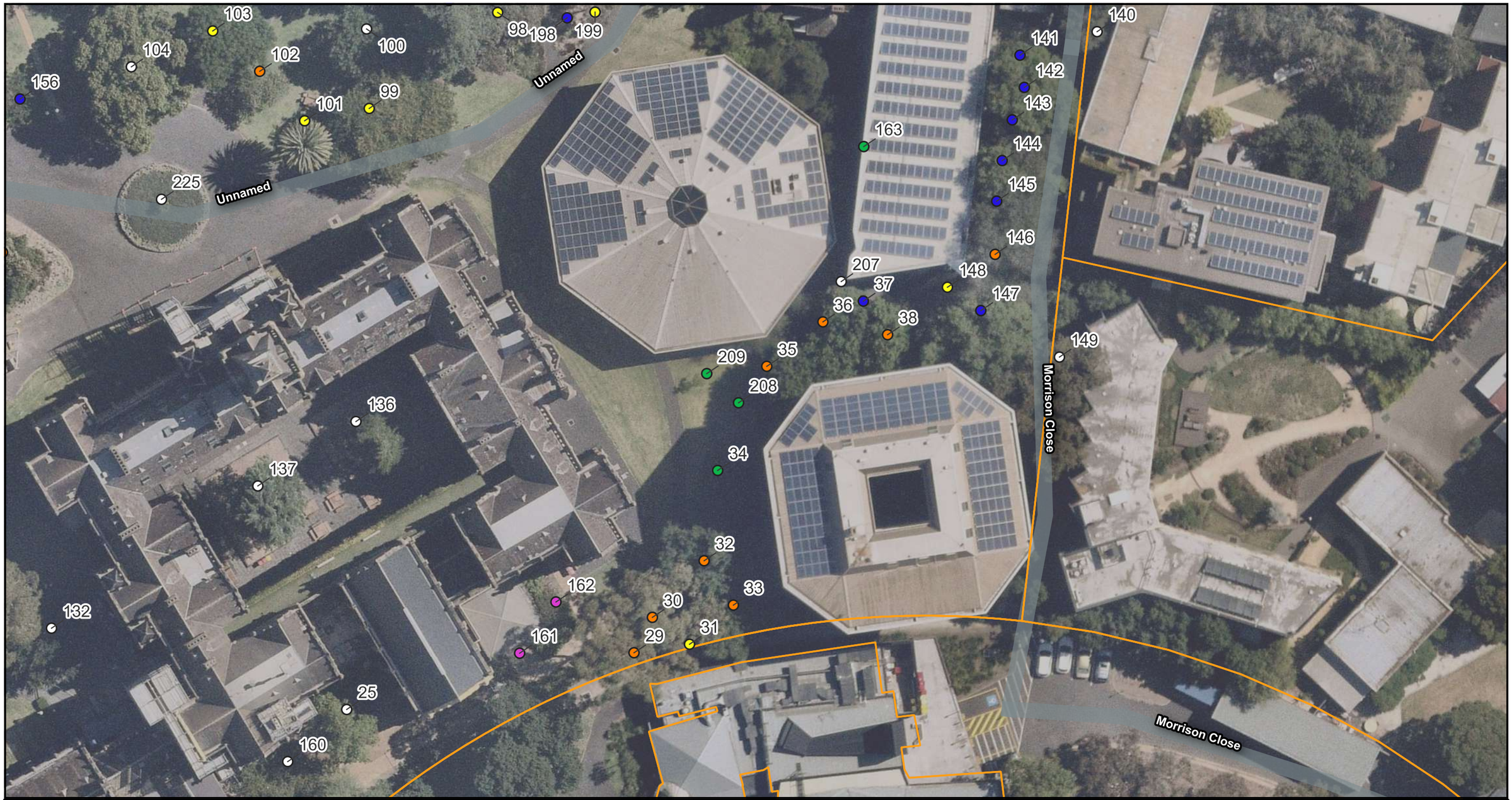
Legend

Work Priority
- High
- Medium
- Low

- Tree Health
- Asset Management
- No works

- Cadastre
- Road

0 10 20 m



N

Coordinate Reference System (CRS)
EPSG: 28355 GDA94/MGA Zone 55

Tree locations are approximate

Melbourne Tree Care
Tree Audit and Risk Assessment Report

Ormond College

Appendix A: Map 4

Legend

Work Priority
- High
- Medium
- Low

- Tree Health
- Asset Management
- No works

- Cadastre
- Road

0 10 20 m

Tree Id: 115 **Location:** Onsite

Botanical Name: *Celtis australis* **Origin:** Exotic

Common Name: European Nettle Tree **Age:** Mature

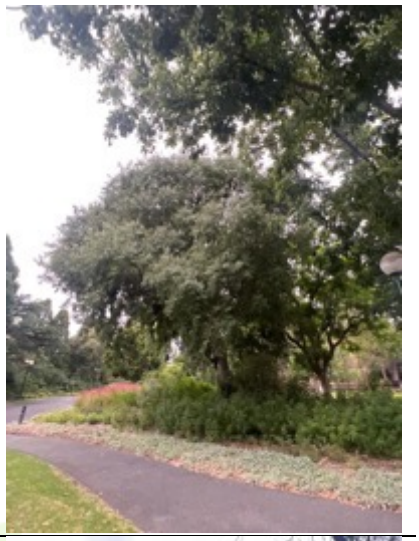
Tree Height (m): 9 **Canopy Spread (m):** 7 **DBH (cm):** 36

Health: Good **Structure:** Fair **ULE:** Medium

Observations: Leaning. Possum grazing.

Works: Possum Guard

Priority: Tree Health **RoH:** <1/1,000,000 **TPZ (m):** 4.32



Tree Id: 116 **Location:** Onsite

Botanical Name: *Acer negundo* **Origin:** Exotic

Common Name Box Elder **Age:** Mature

Tree Height (m): 12 **Canopy Spread (m):** 12 **DBH (cm):** 60

Health: Fair **Structure:** Poor **ULE:** Short

Observations: Decay. Hollows. Included codominant stems. Previously lopped. Previous failures. Cable brace installed.

Works: Deadwood

Priority: High **RoH:** 1/500,000 **TPZ (m):** 7.2

Tree Id: 117 **Location:** Onsite

Botanical Name: *Hesperocyparis arizonica* **Origin:** Exotic

Common Name Arizona Cypress **Age:** Semi mature

Tree Height (m): 10 **Canopy Spread (m):** 5 **DBH (cm):** 30

Health: Good **Structure:** Good **ULE:** Long

Observations:

Works:

Priority: No works **RoH:** <1/1,000,000 **TPZ (m):** 3.6

Tree Id: 118 **Location:** Onsite

Botanical Name: *Brachychiton populneus* **Origin:** Vic. Native

Common Name: Kurrajong **Age:** Mature

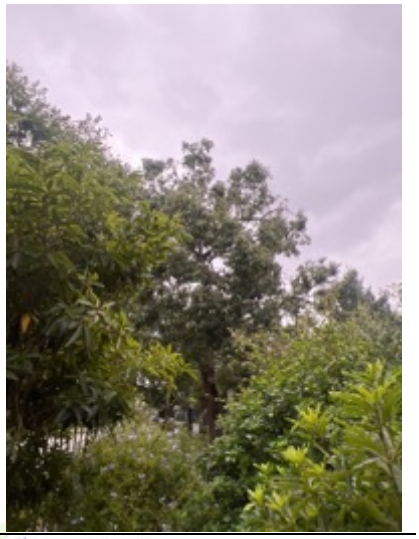
Tree Height (m): 8 **Canopy Spread (m):** 8 **DBH (cm):** 30

Health: Fair **Structure:** Fair **ULE:** Medium

Observations:

Works:

Priority: No works **RoH:** <1/1,000,000 **TPZ (m):** 3.6



Tree Id: 119 **Location:** Onsite

Botanical Name: *Syzygium sp.* **Origin:** Aus. Native

Common Name Lilly Pilly **Age:** Mature

Tree Height (m): 12 **Canopy Spread (m):** 12 **DBH (cm):** 70

Health: Good **Structure:** Fair **ULE:** Medium

Observations: ?australe. Encroaching structures.

Works: Asset clearance

Priority: Asset Management **RoH:** <1/1,000,000 **TPZ (m):** 8.4

Tree Id: 120 **Location:** Onsite

Botanical Name: *Pittosporum undulatum* **Origin:** Vic. Native

Common Name Sweet Pittosporum **Age:** Semi mature

Tree Height (m): 6 **Canopy Spread (m):** 6 **DBH (cm):** 26

Health: Poor **Structure:** Fair **ULE:** Short

Observations: Weed species. Acute codominant stems. In decline.

Works: Removal

Priority: Medium **RoH:** <1/1,000,000 **TPZ (m):** 3.12

Tree Id: 151 **Location:** Onsite

Botanical Name: *Magnolia grandiflora* **Origin:** Exotic

Common Name: Bull Bay **Age:** Semi mature

Tree Height (m): 6 **Canopy Spread (m):** 4 **DBH (cm):** 12

Health: Fair **Structure:** Good **ULE:** Medium

Observations: Thin canopy

Works: Tree Health Treatment

Priority: Tree Health **RoH:** <1/1,000,000 **TPZ (m):** 2

Tree Id: 152 **Location:** Onsite

Botanical Name: *Jacaranda mimosifolia* **Origin:** Exotic

Common Name Jacaranda **Age:** Semi mature

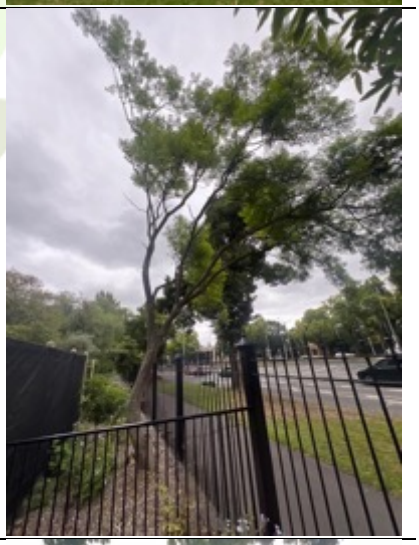
Tree Height (m): 8 **Canopy Spread (m):** 6 **DBH (cm):** 25

Health: Fair **Structure:** Fair **ULE:** Short

Observations:

Works: Deadwood, Tree Health Treatment

Priority: High **RoH:** 1/500,000 **TPZ (m):** 3



Tree Id: 153 **Location:** Onsite

Botanical Name: *Cupressus macrocarpa* **Origin:** Exotic

Common Name Monterey Cypress **Age:** Semi mature

Tree Height (m): 8 **Canopy Spread (m):** 5 **DBH (cm):** 20

Health: Good **Structure:** Good **ULE:** Medium

Observations:

Works:

Priority: No works **RoH:** <1/1,000,000 **TPZ (m):** 2.4

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Tree Id: 211 **Location:** Onsite

Botanical Name: *Tilia cordata* **Origin:** Exotic

Common Name: Small Leaved Lime **Age:** Semi mature

Tree Height (m): 6 **Canopy Spread (m):** 4 **DBH (cm):** 23

Health: Good **Structure:** Fair **ULE:** Medium

Observations: Possum grazed

Works: Possum Guard

Priority: Tree Health **RoH:** <1/1,000,000 **TPZ (m):** 2.76

Tree Id: 212 **Location:** Onsite

Botanical Name: *Olea europaea* **Origin:** Exotic

Common Name European Olive **Age:** Mature

Tree Height (m): 5 **Canopy Spread (m):** 4 **DBH (cm):** 12

Health: Good **Structure:** Fair **ULE:** Medium

Observations: Encroaching structure.

Works: Asset clearance

Priority: Asset Management **RoH:** <1/1,000,000 **TPZ (m):** 2

Tree Id: 213 **Location:** Onsite

Botanical Name: *Pittosporum undulatum* **Origin:** Vic. Native

Common Name Sweet Pittosporum **Age:** Juvenile

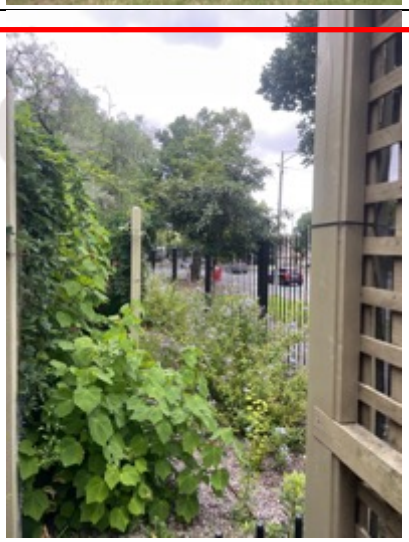
Tree Height (m): 2 **Canopy Spread (m):** 1 **DBH (cm):** 10

Health: Fair **Structure:** Fair **ULE:** Medium

Observations: Group of trees. Weed species

Works:

Priority: No works **RoH:** <1/1,000,000 **TPZ (m):** 2



Appendix C: Glossary of Terms

Age

Juvenile	Juvenile or recently planted approximately 1-7 years.
Semi Mature	Tree actively growing.
Mature	Tree has reached expected size in situation.
Senescent	Tree is over mature and has started to decline.

Origin

Victorian native	Trees that are naturally occurring within Victoria
Australian native	Trees that are naturally occurring within Australia
Exotic	Trees that are not naturally occurring to any part of Australia

USEFUL LIFE EXPECTANCY – ULE

The useful life of a tree is an estimate of how long a tree is likely to remain in the landscape based on health, amenity and risk.

Long ULE Trees that appear to be retainable with an acceptable level of risk for more than 40 years.

1. Structurally sound trees located in positions that can accommodate future growth.
2. Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery.
3. Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

Medium ULE Trees that appear to be retainable with an acceptable level of risk for 15 to 40 years.

1. Trees that may only live between 15 and 40 years.
2. Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals.
3. Trees that may live for more than 40 years but would be removed during the course of normal management for safety and nuisance reasons.
4. Storm damage or defective trees that can be made suitable for retention in the medium term by remedial work.

Short ULE Trees that appear to be retainable with an acceptable level of risk for 5 to 15 years.

1. Trees that may live for 5 to 15 years.

2. Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals.
3. Trees that may live for more than 15 years but would be removed during the course of normal management for safety and nuisance reasons.
4. Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.

0-5 Years Trees with a high level of risk that would need removal within the next 5 years.

1. Dead trees.
2. Dying or suppressed and declining trees through disease or inhospitable conditions.
3. Dangerous trees through instability or recent loss of adjacent trees.
4. Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form.
5. Damaged trees that are considered unsafe to retain.
6. Trees that will become dangerous after removal of other trees for the above reasons.

Condition

This is a combined indicator of 'health' and 'structure' based on the following descriptors:

Health

Good Foliage of tree is entire, with good colour, very little sign of pathogens and of good density. Growth indicators are good ie. Extension growth of twigs and wound wood development. Minimal or no canopy die back (deadwood).

Fair Tree is showing one or more of the following symptoms; < 25% dead wood, minor canopy die back, foliage generally with good colour though some imperfections may be present. Minor pathogen damage present, with growth indicators such as leaf size, canopy density and twig extension growth typical for the species in this location.

Poor Tree is showing one or more of the following symptoms of tree decline; > 25% deadwood, canopy die back is observable, discoloured or distorted leaves. Pathogens present, stress symptoms are observable as reduced leaf size, extension growth and canopy density.

Dead	No vascular function.

Structure

Good	Trunk and scaffold branches show good taper and attachment with minor or no structural defects. Tree is a good example of the species with a well-developed form showing no obvious root problems or pests and diseases.
Fair	Tree shows some minor structural defects or minor damage to trunk eg. bark missing, there could be cavities present. Minimal damage to structural roots. Tree could be seen as typical for this species.
Poor	There are major structural defects, damage to trunk or bark missing. Co-dominant stems could be present or poor structure with likely points of failure. Girdling or damaged roots obvious. Tree is structurally problematic.

Retention Value

- **Exceptional** - trees must be retained at all costs
  - A tree has horticultural, social, historical or cultural value.
  - A tree that has outstanding habitat value.
  - A tree that is an outstanding size for the species.
  - A tree that is remnant.
  - A tree species that is endangered.

- **High** - trees should be considered for retention wherever possible
  - A tree that is in good-fair health and structure with a long ULE.
  - A tree that is in good health, with good structure, is semi mature or mature, and with a medium ULE.
  - A tree that has cultural, botanical, or landscape significance.

- **Medium** - trees should be considered for retention wherever possible but should not pose a material constraint to site development
  - A tree that is in fair health and structure, is semi mature, and with a medium ULE.
    A tree that is in poor health or poor structure, is mature, and with a medium or short ULE.

- **Low -** trees should be removed
  - A tree that is in poor health and structure with a short ULE.
  - Weed species.

- **Third Party** – trees are third party assets and must be retained at all costs.
    - A tree that is located on adjoining properties.
    - A tree that is located on a nature strip.

Work Descriptors

Formative Pruning

The pruning of young or established trees with the aim of directing plant growth or developing a sound structure by reducing codominant stems, pruning out crossing branches.

Deadwood

The removal of deadwood greater than 30 mm diameter over high target areas. Deadwood over low target areas may be left as it provides habitat for invertebrates and roosting spots for birds.

Reduction Pruning

The removal of the end of upright stems and branches and stems that present with structural defects to reduce their likelihood of failure.

Weight Reduction Pruning

The removal of the end of lateral stems and branches and stems that present with structural defects to reduce their likelihood of failure.

Cable Bracing

Where trees have significant structural defects that cannot be mitigated through pruning alone, cable bracing is installed. The cable is installed between codominant stems or on larger lateral branches that are above targets.

Tree Removal

Tree removal is last resort where the tree is either dead, dying or has structural defects that cannot be rectified using tradition tree management options.

Aerial Inspection

Climbing the tree using non-invasive methods to inspect the tree from within the canopy. Aerial inspections are used when the assessing arborist has identified a possible defect

within the canopy that cannot be accurately assessed from ground level. Aerial inspections should be carried out by suitably qualified persons (minimum AQF V).

Uplift Pruning

The pruning of lower branches for pedestrian or vehicle clearance in high use areas.

Asset Clearance Pruning

The pruning of branches to provide clearance from buildings, lights, signs and security cameras.

Tree Health Treatments

Health treatments can include soil testing, soil treatments to remedy toxicities and deficiencies, and pest management.

Appendix D: QTRA Methodology

The Quantified Tree Risk Assessment (QTRA) system, developed by Mike Ellison (2005), applies established and accepted risk management principles to tree safety management. The system moves the management of tree safety away from labelling trees as either 'safe' or 'unsafe' and thereby away from requiring definitive judgements from either tree assessors or tree managers. Instead, QTRA quantifies the risk of significant harm from tree failure in a way that enables tree managers to balance safety with tree values and operate to predetermined limits of tolerable or acceptable risk.

Target
In tree-failure risk assessment, a Target is anything of value that could be harmed in the event of tree failure

Tree or Branch Size
In the quantification of risk from falling trees, stem or branch mass is probably the most realistic available measure of the likely force upon impact. The relationship between the diameter and the mass of the stem or branch provides a readily measurable estimate of this.

QTRA Probability of Failure
The Probability of Failure within the coming year for the tree or branch is estimated in relation to two benchmarks and recorded in the QTRA assessment as a Range of value.

Risk of Harm
The QTRA output is termed the Risk of Harm and is a measure of the likelihood x consequence of tree failure.

Target Ranges

Target Range	Property	Human (not in vehicles)	Vehicle Traffic (number per day)	Ranges of Value
1	$3 400,000- >$340 000	Occupation: Constant – 2.5 hours/day Pedestrians & cyclist: 720/hour – 73/hour	26 000 – 2 700 @ 110kph 28 000 – 2 900 @ 100kph 31 000 – 3 200 @ 90kph 32 000 – 3 300 @ 80kph 36 000 – 3 700 @ 70kph 42 000 – 4 300 @ 60kph 47 000 – 4 800 @ 50kph	1/1 – >1/10
2	$340 000- >$34 000	Occupation: 2.4 hours/day – 15 min/day Pedestrians & cyclist: 72/hour – 8/hour	2 600 – 270@ 110kph 2 800 – 290@ 100kph 3 100 – 320@ 90kph 3 200 – 330@ 80kph 3 600 – 370@ 70kph 4 200 – 430@ 60kph 4 700 – 480@ 50kph	1/10 – >1/100
3	$34 000 - >$3 400	Occupation: 14 min/day – 2 min/day Pedestrians & cyclist: 7/hour – 2/hour	260 – 27@ 110kph 280 – 29@ 100kph 310 – 32@ 90kph 320 – 33@ 80kph 360 – 37@ 70kph 420 – 43@ 43kph 470 – 48@ 50kph	1/100 – >1/1 000
4	$3 400 - >$340	Occupation: 1 min/day – 2 min/week Pedestrians & cyclist: 1/hour – 3/day	26 – 4@ 110kph 28 – 4@ 100kph 31 – 4@ 90kph 32 – 4@ 80kph 36 – 5@ 70kph 42 – 5@ 60kph 47 – 6@ 50kph	1/1 000 – >1/10 000
5	$340 - >$34	Occupation: 1 min/week – 1 min/month Pedestrians & cyclist: 2/day – 2/week	3 – 1@ 110kph 3 – 1@ 100kph 3 – 1@ 90kph 3 – 1@ 80kph 4 – 1@ 70kph 4 – 1@ 60kph 5 – 1@ 50kph	1/10 000 – >1/100 000
6	$34 - $3	Occupation: <1 min/month – 0.5 min/year Pedestrians & cyclist: 1/week – 6/year	None	1/100 000 – 1/1 000 000

Failure Size Ranges

Size Range	Size of Branch	Impact Potential
1	> 450mm (>18") dia.	1/1 - >1/2
2	450mm (18") dia.- 260mm (101/2") dia.	1/2 - >1/8.6
3	250mm (10") dia. - 110mm (41/2") dia.	1/8.6 - >1/82
4	100mm (4") dia. - 25mm (1") dia.	1/82 - 1/2 500

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Probability of Failure Ranges

Probability of Failure	
1	1/1 - >1/10
2	1/10 - >1/100
3	1/100 - >1/1 000
4	1/1,000 - >1/10 000
5	1/10,000 – >1/100 000
6	1/100,000 – >1/1 000 000
7	1/1,000,000 – 1/10 000 000

Risk Threshold Ranges

Thresholds	Description	Action
	Unacceptable Risks will not ordinarily be tolerated	• Control the risk
1/1 000	**Unacceptable** (where imposed on others) Risks will not ordinarily be tolerated	• Control the risk • Review the risk
	Tolerable (by agreement) Risks may be tolerated if those exposed to the risk accept it, or the tree has exceptional value	• Control the risk unless there is broad stakeholder agreement to tolerate it, or the tree has exceptional value • Review the risk
1/10 000	**Tolerable** (where imposed on others) Risks are tolerable if ALARP	• Assess costs and benefits of risk control • Control the risk only where a significant benefit might be achieved at reasonable cost • Review the risk
1/1 000 000	**Broadly Acceptable** Risk is already ALARP	• No action currently required • Review the risk

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Appendix E: Tree Protection Zones

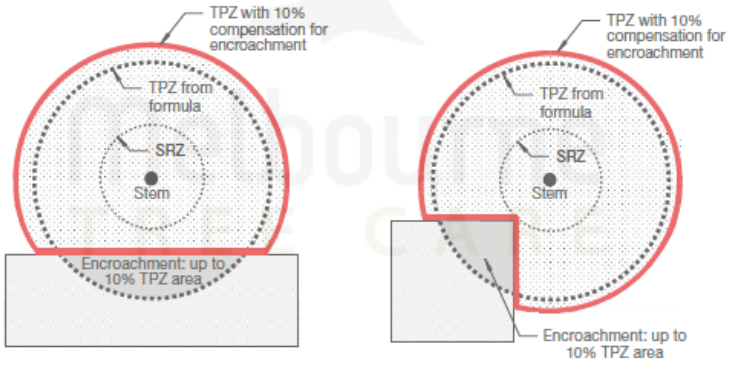
A Tree Protection Zone (TPZ), as stated by the Australian Standard AS4970: 2009, Protection of trees on development sites, is the principal means of protection of trees on development site. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The Australian Standard AS4970: 2009 is being used in assessing the protection areas for each tree as it describes the best practices for the planning and protection of trees on development sites.

In calculating the radius for the Tree Protection Zones (TPZ), the DBH, measured at 1.4m from the ground, is multiplied by 12. The TPZ requirements are as follows:

- If the TPZ is encroached by less than 10%, the Australian Standard AS4970: 2009 states: *detailed root investigations should not be required.*

- If the TPZ is encroached by more than 10%, the Australian Standard AS4970: 2009 states: *the project Arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.*



Examples of encroachment
(AS4970: 2009)

Structural Root Zone (SRZ) is the area around the base of the tree required for stability in the ground. These roots are fundamental for the trees structure and health. The standard states:

"The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area." (AS4970)

To calculate the SRZ, the equation is (D × 50)^0.42 × 0.64, where D is the Diameter at Base (DAB).

The effects of root loss or damage by any means could include:

- Loss of stability if structural woody roots or even lower order woody roots are cut
- Reduction in water and nutrient uptake
- An eventual loss of leaves, reduced photosynthesis and thus sugar production
- Decay as a result of wounding
- Predisposition to soil borne pathogens

Appendix F: References

- Costello, L.R, Perry, E.J, Matheny, N.P, Henry, J.M, Geisel, P.M, 2003. *Abiotic Disorders of Landscape Plants: A Diagnostic Guide.* University of California Agriculture and Natural Resources, Oakland, California.
- Ellison, M.J., 2005, *Quantified tree risk assessment used in the management of amenity trees*, Journal of Arboriculture 31(2) March 2005, International Society of Arboriculture, Champaign, Illinois, USA.
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- de Queiroz, D, Malherbe Camargo, J, Dedecek, R, Oliveira, E, Rocha Zanol, K, Nogueira Melido, R, and Burckhardt, D 2016, 'Effect of silicon application to Eucalyptus camaldulensis on the population of Glycaspis brimblecombei (Hemiptera: Aphalaridae)', *Brazilian Journal Of Forest Research / Pesquisa Florestal Brasileira*, 36, 86, pp. 85-94,
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- Standards Australia 2007 SAI Global – *AS4373-2007 Pruning of Amenity Trees*
- Standards Australia 2009 SAI Global - *AS4970 Protection of Trees on Development Sites*

Appendix G: Qualifications and Experience

Matthew P James has the following qualifications and experience:
Master of Urban Horticulture (studying)
Graduate Certificate in Arboriculture
Diploma of Arboriculture
QTRA (Quantified Risk Assessment) registered user
Arboriculture Australia National Conference: 2016
Tree Anatomy Workshop (Mark Hartley) 2016
Cert Nutrition Farming 2015
15+ Years industry experience

Appendix H: Report Limitations and Constraints

- This is a 'Ground based report'. Trees were inspected from the ground only. Tree canopies were not accessed for inspection unless otherwise stated within the report.
- The report is limited to the time of inspection.
- The report reflects the trees as found on the days of inspection. Any changes to site conditions or surroundings, such as construction works or landscape works may alter the findings of the report subject to conditions and recommendations as set out within the report.
- The report is based on the inspection and the material available at the time of inspection or that information further to the inspection found within the report.
- No soil samples were taken for laboratory analysis.
- Tree roots were not inspected below ground except where previously exposed and/or where otherwise stated within the report.
- All images supplied are interpretations only and should not be taken as true at time of inspection or indicative of tree condition or status at time of inspection or time of report release, inclusive of Google images if applicable

Appendix I: Disclaimer

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