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Arboricultural Impact Assessment Report

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1. INTRODUCTION

1.1 Hugh The Arborist Pty Ltd has been instructed by Jack Zhang to inspect trees located on and adjoining the site that may be impacted by a proposed subdivision.

1.2 All tree data was collected during one site inspection on Wednesday 12th June 2019, the weather was clear with average visibility.

Table 1: documents and plans provided.

Title	Author	Date created	Plan/Doc. Ref.
Site Plan	David Baillie Architect	31/7/2019	A1001 F
Civil and Struc. Engineer Plans	E A Bennett	14/8/2019	Z-11-26-72-43 1C

2. SCOPE OF THE REPORT

2.1 **This report has been undertaken to meet the following objectives;**

2.1.1 Conduct a visual assessment from ground level of eighty two trees located on and adjoining the site as identified on the plans provided. For the purpose of this report, a tree taken to have height equal to or greater than 5 metres.

2.1.2 Dead trees and trees less than five metres in height have not been included in the report.

2.1.3 Determine the trees estimated contribution years and remaining, useful life expectancy and award the trees a retention value.

2.1.4 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).

2.1.5 Provide pragmatic recommendations for the management of trees and mitigation of construction impacts on retained trees.

2.1.6 Specify tree protection measures for trees to be retained in accordance with AS 4970-2009.

3. LIMITATIONS

3.1 The findings of this report are based on the observations and site conditions at the time of inspection.

3.2 Where access was limited due to trespass issues, measurements have been estimated.

3.3 Several trees assessed have not been located on the site plans provided. Their locations have been estimated using available setbacks taken on site.

3.4 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.

3.5 The tree inspections were 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.

3.6 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.

3.7 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.

3.8 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 a spp.

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 Hugh The Arborist neither guarantees, nor is responsible for, the accuracy of information provided by others that is contained within this report.

3.11 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.

3.12 The ultimate safety of any tree cannot be categorically guaranteed. Even trees apparently free of defects can collapse or partially collapse in extreme weather conditions. Trees are dynamic, biological entities subject to changes in their environment, the presence of pathogens and the effects of ageing. These factors reinforce the need for regular inspections. It is generally accepted that hazards can only be identified from distinct defects or from other failure-prone characteristics of a tree or its locality.

3.13 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 above ground level) - millimetres.
- 4.1.5 Estimated height - metres
- 4.1.6 Estimated crown spread (Radius of crown) - metres
- 4.1.7 Health
- 4.1.8 Structural condition
- 4.1.9 Amenity value
- 4.1.10 Estimated remaining contribution years (SULE)[1]
- 4.1.11 Retention value (Tree AZ)[2]
- 4.1.12 Notes/comments

4.2 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer, 1994).[3]

4.3 Tree diameter was measured using a DBH tape or in some cases estimated. All other measurements were estimations unless otherwise stated. The other tools I used during the assessment were a digital camera, Japanese made 170mm blade digging knife and a Leica DistoD410 digital laser tape.

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[1] Barrell Tree Consultancy, *SULE: Its use and status into the New Millennium*, TreeAZ/03/2001, http://www.treeaz.com/.

[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).

4.4 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). See appendices for more information.

4.5 Details of how the observations in this report have been assessed are listed in the appendices.

5. SITE LOCATION AND BRIEF DESCRIPTION OF THE PROPOSAL

5.1 The site is located in the in the Northern Beaches Council suburb of Frenches Forest. All trees at the site are managed under the Warringah Local Environmental Plan (LEP) 2011[4], Warringah Development Control Plan (DCP) 2011, Northern Beaches Tree Management Controls and State Environmental Planning Policy (Vegetation in Non-Rural Areas 2017).

5.2 For the purpose of this assessment 'the site' is taken to be both 12 and 14 Gladys Avenue. The site is a large battle-axe block orientated South (front) to north (rear). There are two existing dwellings located to the centre east and west of the site. The site becomes increasingly steep from approximately the middle and falls significantly with a series of near vertical natural rock outcrops toward the rear.

5.3 The vegetation community on site is highly varied with a range of native and non-native tree species with a varying maturity. Most of the significant, high value trees are located on adjoining properties. There is an abundance of trees and Palms that ate located within the site that feature on the Northern Beaches Council exempt tree species list.

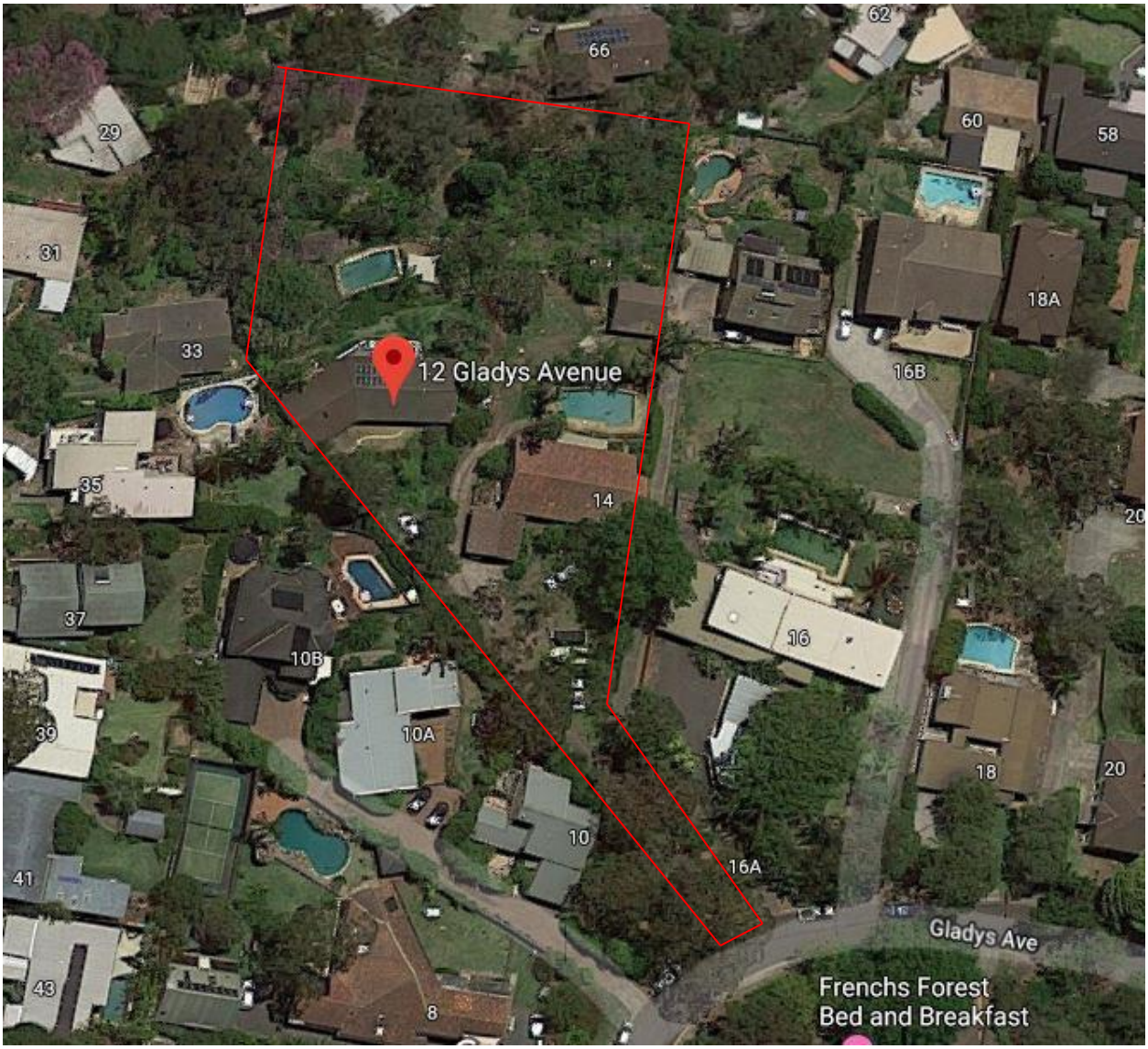
5.4 The site is not located within a heritage conservation area, does not contain terrestrial biodiversity and does not form part of a wildlife corridor.[5]

5.5 The development proposal consists of the subdivision of 12 and 14 Gladys Avenue into six lots. The two existing dwellings are proposed to be retained. A series of retaining walls have been proposed within the site to allow for access to the rear lots, storm water and a detention tank have also been proposed to be installed as part of the subdivision.

[4] https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/Public/XC.Track/SearchProperty.aspx?id=128235

[5] https://services.northernbeaches.nsw.gov.au/icongis/index.html

Tile 1: Site Location and approximate boundary[6]



6 https://www.google.com.au/maps/place/33A+Central+Rd,+Avalon+Beach+NSW+2107

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

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

6.2 **Site plans:** Appendix 1 shows the existing trees on the proposed site plan. Appendix 1a shows the retained trees and the required tree protection measures.

6.3 Tree location, Trunk, Canopy spread, TPZ and SRZ information has been overlaid across all plans.

6.4 **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.

6.5 **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 x 50) $^{0.42}$ x 0.64. There are several factors that can vary the SRZ which include height, crown area, soil type and soil moisture. It can also be influenced by other factors such as natural or built structures. Generally, work within the SRZ should be avoided. Soil level changes should also generally be avoided inside the SRZ of trees to be retained. Palms, other monocots, cycads and tree ferns do not have an SRZ. See the appendices for more information about the SRZ.

6.6 **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.

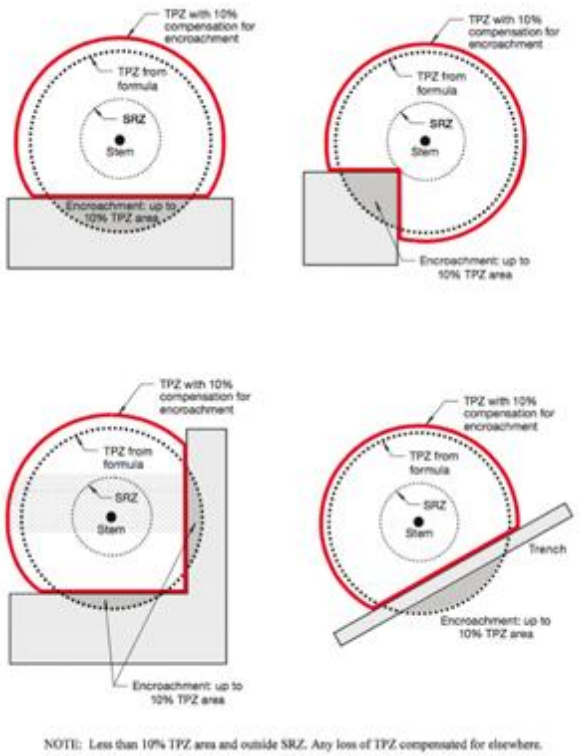

Image 1: Example minor TPZ encroachment from AS4970-2009.

6.7 **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. ASSESSEMENT OF CONSTRUCTION IMPACTS

7.1 **Table 2:** In the table below the impact of proposed development impact to all trees included in the report has been assessed. **See recommendations section for impact mitigation advice.**

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	*Angophora costata*	AA 1	9.6	3.2	Minor	Tree located on neighboring property. Minor encroachment of less than 10% into the TPZ, no encroachment into the SRZ area. Proposal will be of low impact.	Retain and protect
2	*Angophora costata*	A1	7.2	2.8	Major	Tree located on neighboring property. The proposed widening of the driveway will encroach into the TPZ area by up to 20.3%. No encroachment proposed within the SRZ area. The existing driveway occupies 8.1% of the proposed encroachment leaving a new encroachment of 12.2%. This is still considered a major encroachment however it may be managed at an acceptable level by retaining the existing driveway during development and sensitive driveway design for wider sections.	Retain and protect
3	*Eucalyptus resinifera*	A1	2.0	1.7	None	Tree located outside of the development area.	Retain and protect.
4	*Angophora costata*	A1	4.8	2.3	None	Tree located on neighboring property and outside of the development area.	Retain and protect.
5	*Eucalyptus resinifera*	A1	4.1	2.5	Minor	Tree located on neighboring property. The proposed widening of the driveway will encroach less than 10% into the TPZ with none proposed in the SRZ area. The existing driveway occupies a portion of the proposed encroachment rendering it of acceptable impact.	Retain and protect

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
6	*Angophora costata*	AA 1	6.4	2.7	Major	Major encroachment of up to 35% into the TPZ area and none proposed within the SRZ of the tree. Amendments have been made to the driveway to increase the setback to outside of the structural root radius. The remaining driveway encroachment (up to 35m^2) has been proposed on a pier and beam system to further reduce the impact on the subject tree. The impact proposed will be of acceptable on the provision piers are installed to retain roots greater than 40mm in diameter and the driveway is constructed on or above the existing grade.	Retain and protect
7	*Cupressus sempervirens*	Z3	3.6	2.1	Major	Major encroachment proposed from the widening of the driveway. Species is exempt from protection in NBLGA and has been identified for removal.	Remove and replace.
8	*Chamaecyparis lawsoniana*	Z3	2.2	1.7	Major	Major encroachment proposed from the widening of the driveway. Species is exempt from protection in NBLGA and has been identified for removal.	Remove and replace.
9	*Chamaecyparis lawsoniana*	Z3	2.2	1.7	Footprint	Tree located in the proposed footprint of the widening of the driveway. Species is exempt from protection in NBLGA and has been identified for removal.	Remove and replace.
10	*Cupressus macrocarpa*	Z3	10.8	3.3	Major	Major encroachment proposed from the widening of the driveway. Species is exempt from protection in NBLGA and has been identified for removal.	Remove and replace.

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
11	*Cupressus macrocarpa*	Z3	10.8	3.3	Major	Major encroachment proposed from the widening of the driveway. Species is exempt from protection in NBLGA and has been identified for removal.	Remove and replace.
12	*Angophora costata*	Z10	4.8	2.5	Major	Tree located on neighboring property. Major encroachment of up to 35% into the TPZ and SRZ area from the proposed driveway. While it is possible to construct the driveway using tree sensitive techniques the tree has been identified as in fair to poor condition. The encroachment is likely to further contribute to the trees decline in health and possibly kill it. The tree may be retained if the driveway is not widened within 4.8m of the tree. This will retain the existing levels around the tree and not contribute to any further decline.	Retain and protect.
13	*Angophora costata*	A1	7.8	2.9	Minor	Tree located on neighboring property. Minor encroachment of up to 10% into the TPZ area and none within the SRZ area from the proposed driveway. This is considered to be of low and acceptable impact.	Retain and protect
14	*Syagrus romanzoffianum*	Z3	2.4	0.0	Footprint	Tree located within the footprint of the proposed driveway. Species is exempt from protection in NBLGA.	Remove and replace
15	*Liquidambar styraciflua*	Z3	10.8	3.3	None	Tree located within Lot 4 which is proposed to be retained. Tree located outside of the construction area.	Retain and protect

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
16	*Lagerstroemia indica*	Z3	1.9	2.3	None	Tree located within Lot 4 which is proposed to be retained. Tree located outside of the construction area.	Retain and protect
17	*Callistemon viminalis*	A1	3.3	2.8	Footprint	Tree located within the footprint of the proposed driveway.	Remove and replace
18	*Washingtonia robusta*	Z3	4.8	0.0	None	Tree located within Lot 4 which is proposed to remain unchanged. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
19	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	None	Tree located within Lot 4 which is proposed to remain unchanged. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
20	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	None	Tree located within Lot 4 which is proposed to remain unchanged. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
21	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
22	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
23	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
24	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
25	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
26	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
27	*Archontophoenix cunninghamiana*	Z3	2.2	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
28	*Syagrus romanzoffianum*	Z3	2.4	0.0	Footprint	Tree located within the footprint of the proposed dwelling. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
29	*Syagrus romanzoffianum*	Z3	2.4	0.0	Major	Major encroachment of up to 30% from the proposed construction storage area and proposed crane platform on Lot 5. This is considered to be of high impact. Species is listed as exempt from protection in NBLGA.	Remove and replace.
30	*Brachychiton acerifolius*	Z3	3.6	2.2	Major	Up to 39.4% encroachment into the TPZ area and the SRZ area from the proposed driveway and construction road. This is considered to be of high impact to the tree. Species is listed as exempt from protection in NBLGA.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
31	*Melaleuca quinquenervia*	Z4	6.4	3.2	Footprint	Tree located within the footprint of the proposed access road. The tree has been identified as in poor structural condition with internal basal decay and an open basal cavity.	Remove and replace.
32	*Melaleuca quinquenervia*	A1	9.6	3.2	Minor	Less than 10% encroachment proposed into the TPZ area and none into the SRZ from the area proposed for a granny flat. This is considered to be of low and acceptable impact.	Retain and protect
33	*Brachychiton acerifolius*	Z3	3.9	2.3	None	Tree located within Lot 1 which is proposed to be retained. Tree located outside of the construction area.	Retain and protect
34	*Casuarina Spp*	AA 1	5.4	2.6	None	Tree located within the neighboring property. Lot 1 is proposed to be retained. Tree located outside of the construction area.	Retain and protect
35	*Archontophoenix cunninghamiana*	Z3	2.4	0.0	None	Tree located outside of the construction area. Species is listed as exempt from protection in NBLGA and has been proposed for removal.	Remove and replace
35A	*Macadamia Spp.*	A2	1.2	1.5	None	Tree located outside of the construction area.	Retain and protect
35B	*Olea europeaea subsp. cuspidata*	Z3	4.2	2.3	Minor	Less than 10% encroachment into the TPZ area and none into the SRZ from the proposed Lot 2 dwelling. This is considered to be of low and acceptable impact.	Retain and protect
36	*Melaleuca quinquenervia*	Z10	3.1	2.3	Major	Up to 20.5% encroachment into the TPZ and SRZ from the proposed access road and grading of the site. The subject tree has been identified as in poor structural condition with no apical leader.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
37	*Melaleuca quinquenervia*	Z10	3.1	2.3	Major	Up to 22.2% encroachment into the TPZ and SRZ from the proposed access road and grading of the site. The subject tree has been identified as in poor structural condition with no apical leader.	Remove and replace
38	*Acmena smithii*	A1	7.6	2.8	Major	Up to 16.6% encroachment into the TPZ and the SRZ from the proposed dwelling. This is considered to be of high impact to the tree. The impact may be reduced to an acceptable level by using a cantilever for the corner of the proposed structure within 2.8 meters of the tree trunk. The south western corner of the dwelling proposed on Lot 2 is recommended to be cantilevered within 2.8 meters of tree 38. The reason is to remove impact to the structural root system.	Retain and protect.
39	*Jacaranda mimosifolia*	Z3	2.8	2.0	Footprint	Tree located within the footprint of the proposed dwelling, species is listed as exempt from protection in NBLGA.	Remove and replace
40	*Syagrus romanzoffianum*	Z3	2.4	0.0	Footprint	Tree located within the proposed dwelling footprint of Lot 2.	Remove and replace
41	*Syagrus romanzoffianum*	Z3	2.4	0.0	Footprint	Tree located within the proposed dwelling footprint of Lot 2.	Remove and replace
42	*Syagrus romanzoffianum*	Z3	2.4	0.0	Footprint	Tree located within the proposed dwelling footprint of Lot 2.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
43	*Banksia integrifolia*	A2	2.5	2.0	Footprint	Tree located within the proposed dwelling footprint of Lot 2.	Remove and replace
44	*Syagrus romanzoffianum*	Z3	2.9	0.0	Footprint	Tree located within the proposed dwelling footprint of Lot 2.	Remove and replace
45	*Ficus rubiginosa*	A2	3.4	2.1	Footprint	Tree located within the proposed dwelling footprint of Lot 2.	Remove and replace
46	*Eucalyptus resinifera*	A2	5.1	2.5	Footprint	Tree located within the proposed footprint of the detention tank, access road and battered slope to access the lower sections of the site (for construction). Tree will be subject to unsustainable levels of disturbance and is not retainable under the proposal.	Remove and replace
47	*Jacaranda mimosifolia*	Z3	2.3	2.3	Footprint	Tree located within the footprint of a retaining wall approximately 5 meters high. The retaining wall has been proposed to provide level vehicle parking to the dwellings constructed on a lower level.	Remove and replace
48	*Chamaecyparis lawsoniana*	Z3	7.2	2.8	Footprint	Tree located within the footprint of a retaining wall approximately 5 meters high. The retaining wall has been proposed to provide level vehicle parking to the dwellings constructed on a lower level.	Remove and replace
49	*Banksia integrifolia*	A1	1.3	1.6	Footprint	Tree located within the proposed dwelling footprint of Lot 2.	Remove and replace
50	*Eucalyptus punctata*	Z5	6.7	2.7	Unstable	Tree was identified as partially failed at the time of the site assessment. Recommendations were made to have the tree removed prior to the development and the tree has been removed.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
51	*Jacaranda mimosifolia*	Z3	2.8	2.3	Footprint	Tree located within the proposed dwelling footprint of Lot 3.	Remove and replace
52	*Melaleuca quinquenervia*	A1	6.8	2.5	Footprint	Tree located within the proposed dwelling footprint of Lot 3.	Remove and replace
53	*Melaleuca quinquenervia*	A1	6.8	2.5	Footprint	Tree located within the proposed dwelling footprint of Lot 3.	Remove and replace
54	*Melaleuca quinquenervia*	A1	4.8	2.5	Footprint	Tree located within the proposed dwelling footprint of Lot 3.	Remove and replace
55	*Melaleuca quinquenervia*	A1	4.8	2.5	Footprint	Tree located within the proposed dwelling footprint of Lot 3.	Remove and replace
56	*Melaleuca quinquenervia*	A1	4.8	2.5	Footprint	Tree located within the proposed dwelling footprint of Lot 3.	Remove and replace
57	*Melaleuca quinquenervia*	A1	3.4	2.0	Major	Up to 33.3% encroachment into the TPZ and some onto the SRZ from the proposed dwelling. This is considered to be a major encroachment to the tree. It may be possible to retain the tree if below ground root investigations are carried out to locate significant roots and the entire structure is constructed above grade on pier and beam.	Remove and replace
58	*Melaleuca quinquenervia*	A1	6.4	2.5	Major	Up to 34.2% encroachment into the TPZ and some onto the SRZ from the proposed dwelling. This is considered to be a major encroachment to the tree. It may be possible to retain the tree if below ground root investigations are carried out to locate significant roots and the entire structure is constructed above grade on pier and beam.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
59	*Melaleuca quinquenervia*	A1	4.6	2.3	Minor	Tree located on neighboring property. No structures proposed within the TPZ or SRZ area, construction will be of negligible impact to the tree.	Retain and protect
60	*Jacaranda mimosifolia*	Z3	1.8	1.7	None	Tree located outside of the dwelling footprint.	Retain and protect
61	*Eucalyptus sideroxylon*	Z10	1.7	1.6	None	Tree located outside of the dwelling footprint.	Retain and protect
62	*Banksia serrata*	A1	2.8	2.5	Minor	No structures proposed within the TPZ or SRZ area, construction will be of negligible impact to the tree.	Retain and protect
63	*Eucalyptus piperita*	A1	6.0	2.8	Major	Up to 10% TPZ encroachment from the proposed dwelling on Lot 6. This is considered to be of low and acceptable impact to the tree.	Retain and protect
64	*Banksia serrata*	A1	2.2	2.0	None	Tree located outside of the dwelling footprint.	Retain and protect
65	*Angophora costata*	Z10	3.5	2.0	Major	It is noted the subject tree is heavily leaning and may have partially failed at base. The tree is recommended for replacement.	Remove and replace
66	*Angophora costata*	A2	3.4	2.0	Footprint	Tree located within the footprint of the proposed dwelling.	Remove and replace
67	*Angophora costata*	A2	4.2	2.3	Footprint	Tree located within the footprint of the proposed dwelling.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
68	*Eucalyptus piperita*	Z10	1.4	1.5	None	Tree located outside of the development footprint.	Retain and protect
69	*Banksia serrata*	A2	4.4	2.4	Footprint	Tree located within the footprint of the proposed dwelling.	Remove and replace
70	*Banksia serrata*	A2	3.1	2.0	Major	Up to 40% encroachment into the TPZ area and into the SRZ. This is considered to be of high and unsustainable impact to the tree.	Remove and replace
71	*Pittosporum undulatum*	A1	3.7	2.3	Footprint	Tree located within the footprint of the proposed dwelling on Lot 6.	Remove and replace
72	*Banksia serrata*	A1	3.6	2.2	None	Tree located outside of the development footprint.	Retain and protect
72A	*Eucalyptus resinifera*	A1	5.4	2.5	Footprint	Tree located within the footprint of the proposed dwelling on Lot 6.	Remove and replace
73	*Banksia serrata*	A2	2.4	2.1	Footprint	Tree located within the footprint of the proposed dwelling on Lot 6.	Remove and replace
74	*Casuarina glauca*	A1	2.2	1.7	Footprint	Tree located within the footprint of the proposed dwelling on Lot 6.	Remove and replace
75	*Cinnamomum camphora*	Z3	3.6	2.3	Major	Up to 26% encroachment into the TPZ and the SRZ from the proposed dwelling on Lot 6. Species is listed as exempt from protection in NBLGA.	Remove and replace
76	*Cinnamomum camphora*	Z3	3.6	2.3	Major	Up to 26% encroachment into the TPZ and the SRZ from the proposed dwelling on Lot 6. Species is listed as exempt from protection in NBLGA.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
77	*Pittosporum undulatum*	A2	2	1.7	Major	Up to 26% encroachment into the TPZ and the SRZ from the proposed dwelling on Lot 6. Species is listed as exempt from protection in NBLGA.	Remove and replace
78	*Pittosporum undulatum*	A2	2	1.7	Footprint	Tree located within the footprint of a proposed dwelling.	Remove and replace
79	*Brachychiton acerifolius*	Z3	2.5	2.0	Footprint	Tree located within the footprint of a proposed dwelling.	Remove and replace

8. CONCLUSIONS

8.1 **Table 3:** Summary of the impact to trees during the development;

Impact	Reason	Category A	Category Z
		A	Z
Trees to be removed	Building/landscape construction, new surfacing and/or proximity, or trees in poor condition.	17,43,45,46,49,52,53,54,55, 56,57,58,62,63,66,67,69,70,71, 72A,73,74,77,78 (Twenty Two Trees)	7,8,9,10,11,14,18,19,20,21, 22,23,24,25,26,27,28,29,30, 31,36,37,39,40,41,42,44,47. 48,50,51,65,75,76,79 (Thirty Five Trees)
Retained trees subject to TPZ encroachment	Removal of existing surfacing/structures and/or installation of new surfacing/structures will not significantly impact the tree	1,2,5,6,13,32,38, 59,62, 63 (Ten Trees)	12,35B (Two Trees)
Retained trees subject to no TPZ encroachment	Located outside of the construction area	3,4,34,35A,64,72 (Six Trees)	15,16,33,35,60,61,68 (Seven Trees)

9. PHOTOGRPAPHS

Photo A: Looking up the shared driveway toward Gladys Ave.

Photo B: Grove of Paperbarks at the rear of the site (Lot 3).

Photo C: Lot 6, trees not included on survey plans.

Photo D: Lot 6, rock outcrops.

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10. RECOMMENDATIONS

10.1 **Refer to tables 2 and 3 for individual tree identification and discussions.**

10.2 This report assesses the impact of a proposed development at the site to eighty two trees located on and adjoining the site.

10.3 The proposed development will require twenty (22) higher value category A trees to be removed and thirty four (35) low value category Z trees to be removed.

10.4 A total of 57 trees are proposed to be removed.

10.5 Impacted trees that will be suitable for retention consist of twelve (10) higher value category A trees and two (2) low value category Z trees.

10.6 Trees that will not be impacted by the development to be retained consist of six (6) higher value category A trees and eight (7) low value Category Z trees.

A total of twenty six (25) trees will be retained and protected during the development process.

10.7 It is recommended that all trees proposed to be removed through the development process are replaced with a species and ratio compliant with Council objectives.

10.8 Several of the retained trees subject to construction impact will require design modification or specific methods of construction to enable their retention. These trees are higher value category A trees worthy of retention.

10.9 It is recommended the existing driveway be retained for the duration of the development to serve as ground protection from construction traffic for existing trees.

10.10 The south western corner of the dwelling proposed on Lot 2 is recommended to be cantilevered within 2.8 meters of tree 38. The reason is to remove impact to the structural root system.

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10.11 Tree 6 has been provided a greater setback from the proposed driveway which is now located outside of the Structural Root Zone. The remaining driveway has been proposed on piers to further reduce the proposed impact.

10.12 Piers are to be excavated manually or using Hydro-vac techniques. All roots greater than 40mm in diameter are to be retained and protected. All works within the 6.4 metre TPZ radius are to be overseen by the Project Arborist and constructed on or above the existing grade.

10.13 Tree number 12 is located on a neighbouring property and will be subject to high impact by the proposed development. It is recommended that the driveway remains on the existing footprint within 4.8 metres (the TPZ radius) to minimise impacts on the neighbouring tree.

10.14 Tree 50 was identified as partially failed at the time of the site assessment. Recommendations were made to have the tree removed prior to the development and the tree has been removed.

10.15 All roots greater than 50mm in diameter are to be retained and protected. Excavations within the calculated TPZ area are to be carried out using air spade, water jet and manual means. All excavations within the TPZ area are to be overseen and monitored by the Project Arborist

10.16 **New boundary walls** should avoid continuous strip footings and be constructed using timber posts, lap and cap style fencing. This is considered to be non-invasive to trees and will be suitable to install where necessary inside the structural root zones of retained trees.

10.17 **New footpaths and hard surfaces**, should be constructed on or above existing soil grades to minimise root disturbance and consider using a permeable surface. Footpath should be located outside the SRZ, manually excavated and retrain roots greater than 40 millimetres in diameter.

10.18 All works within the TPZ and SRZ of retained trees are to be overseen by an AQF5 Consulting Arborist to assist with minimising development impact.

10.19 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. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention.

10.20 No landscape plan has been assessed in this report. See section 11 for general guidance in relation to minimising the impact of proposed landscaping to retained trees.

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11. ARBORICULTURAL WORK METHOD STATEMENT (AMS) AND 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 and be provided a copy of this report.

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 must 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 principle 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. I recommend regular site inspections on a frequency based on the longevity of the project, this is to be agreed in the initial meeting.

11.5 **Site Specific Tree Protection Recommendations:**

Table 4: Protection Requirements: See appendix 1B for indicative protection location.

Tree Number	Protection Specification Ref Appendix 1B Site Plan and Tree Management Plan
1-6	- Tree protective fencing installed as group protection at the edge of the existing driveway. - Provide mulch at depth of 100mm on grass verge between boundary and drive.
12	- Tree protective fencing at edge of existing drive and 5 metres elsewhere. - Provide mulch at depth of 100mm on grass verge between boundary and drive.
13	- Retain existing driveway for ground protection. Boundary fence will provide isolation from construction.
15-16	- Tree protective fencing at 10.7m, group protection. - Mulch to depth of 100mm.
32-34	- Tree protective fencing at edge of garden bed. Driveway to remain and provide ground protection.
35,35a,72	- Not required. Outside of construction area.
35b, 38	- Tree protective fencing to follow line of proposed dwelling and back to the existing retaining wall.
59, 60,61,62,63,64	- One fence across the width of the rear lot 3 setback 8m from the rear boundary.
68,69	- One fence across the width of the rear lot 6 setback 5m from the rear boundary.

11.6 **Tree protection Specifications:** See sections below for site/tree specific requirements. It is the responsibility of the principle contractor to install tree protection prior to works commencing at the site (prior to demolition works) and to ensure that the tree protection remains in adequate condition for the duration of the development. The tree protection must not be moved without prior agreement of the project Arborist. The project Arborist must inspect that the tree protection has been installed in accordance with this document and AS4970-2009 prior to works commencing.

11.7 **Protective fencing:** 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. Where the installation of fencing in unfeasible due to restrictions on space, trunk and branch protection will be required (see below). The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing must only be removed for the landscaping phase and must be authorised by the project Arborist. Any modifications to the fencing locations must be approved by the project Arborist.

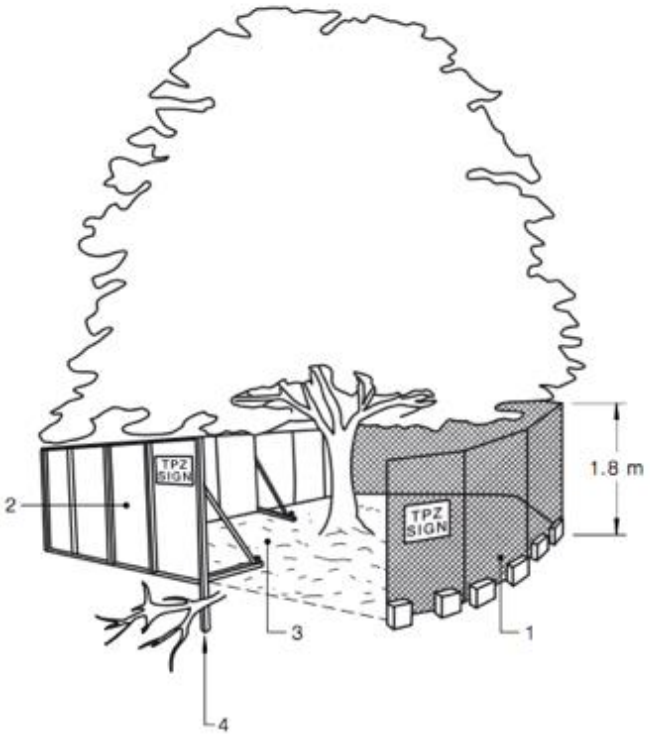
11.8 **TPZ signage:** Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:

- 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

11.9 **Trunk and Branch Protection:** The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm or similar) should then be placed around tree trunk. The timber planks should be spaced at 100mm intervals, and must be fixed against the trunk with tie wire, or strapping and connections finished or covered to protect pedestrians from injury. The hessian and timber planks must not be fixed to the tree in any instance. The trunk and branch protection shall be installed prior to any work commencing on site and shall be maintained in good condition for the entire development period.

11.10 **Mulch:** Any areas of the TPZ located inside the subject site (only trees to be retained directly adjacent to site works must be mulched to a depth of 75mm with good quality composted wood chip/leaf mulch.

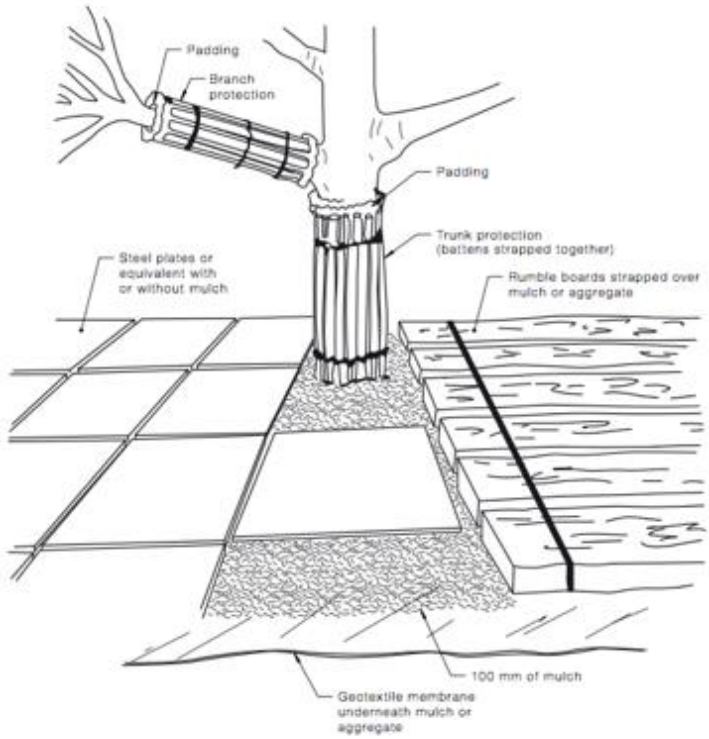
11.11 **Ground Protection:** Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to a depth of between 150-300mm, laid on top of geo textile fabric, overlaid with durable timber boards/plywood. 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 by the project Arborist as required.



LEGEND:
1 Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2 Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3 Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.
4 Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.

An image from AS4970-2009,[7] with example tree protection.

[7] Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 16.



NOTES:

1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.

2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

An image from AS4970-2009,[8] with example tree protection.

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

A) Machine excavation.
B) Ripping or cultivation of soil.
C) Storage of spoil, soil or any such materials
D) Preparation of chemicals, including preparation of cement products.
E) Refueling.
F) Dumping of waste.

[8] Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 17.

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.

11.13 **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.

11.14 **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 10mm 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).[9] 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.

11.15 **Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimize the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.

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

11.16 **Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimize the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.

- 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. Footpath 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.
- 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 30mm in diameter.

11.17 **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.

11.18 **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.

11.19 **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. HOLD POINTS

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.

12.2 **Hold points applicable to the development have been shaded in grey.**

Hold Point	Stage	Responsibility	Certification	Complete Y/N and date
Project Arborist to hold pre construction site meeting with principle 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.	Prior to work commencing.	Principle contractor	Project Arborist	
Project Arborist to assess and certify that tree protection has been installed in accordance with section 11 and AS4970-2009 prior to works commencing at site.	Prior to development work commencing.	Principle contractor	Project Arborist	
In accordance with AS4970-2009 the project arborist should carryout regular site inspections to ensure works are carried out in accordance with the recommendations.	Ongoing throughout the development	Principle contractor	Project Arborist	
Project Arborist to oversee all manual excavations for piers and demolition inside the TPZ of any tree to be retained.	Construction	Principle contractor	Project Arborist	

Project Arborist to certify that all pruning of roots greater than 40mm in diameter has been carried out in accordance with AS4373-2007. All root pruning must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3.	Construction	Principle contractor	Project Arborist	
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	Principle contractor	Project Arborist	
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 minimize the impact to trees.	Landscape	Principle contractor	Project Arborist	
After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigor and authorize the removal of protective fencing. If changes to condition are identified the project Arborist should provide recommendations for remediation.	Upon completion of construction	Principle contractor	Project Arborist	
Any wounding or injury that occurs to a tree during the demolition/construction process will require the project arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. All remediation work is to be carried out by the project arborist, at the contractor's expense.	Ongoing throughout the development	Principle contractor	Project Arborist	

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14. LIST OF APPENDICES

The following are included in the appendices:

Appendix 1 – Proposed Site Plan
Appendix 1A – Retained Trees and Tree Protection Plan
Appendix 2 - Tree inspection schedule
Appendix 3 - Health
Appendix 4 – Tree Protection Zone
Appendix 5 – Structural Root Zone
Appendix 6 – Amenity Value
Appendix 7 – Age Class
Appendix 8 – Structural Condition
Appendix 9 – SULE Categories
Appendix 10 – Retention Values
Appendix 11 – Trees AZ

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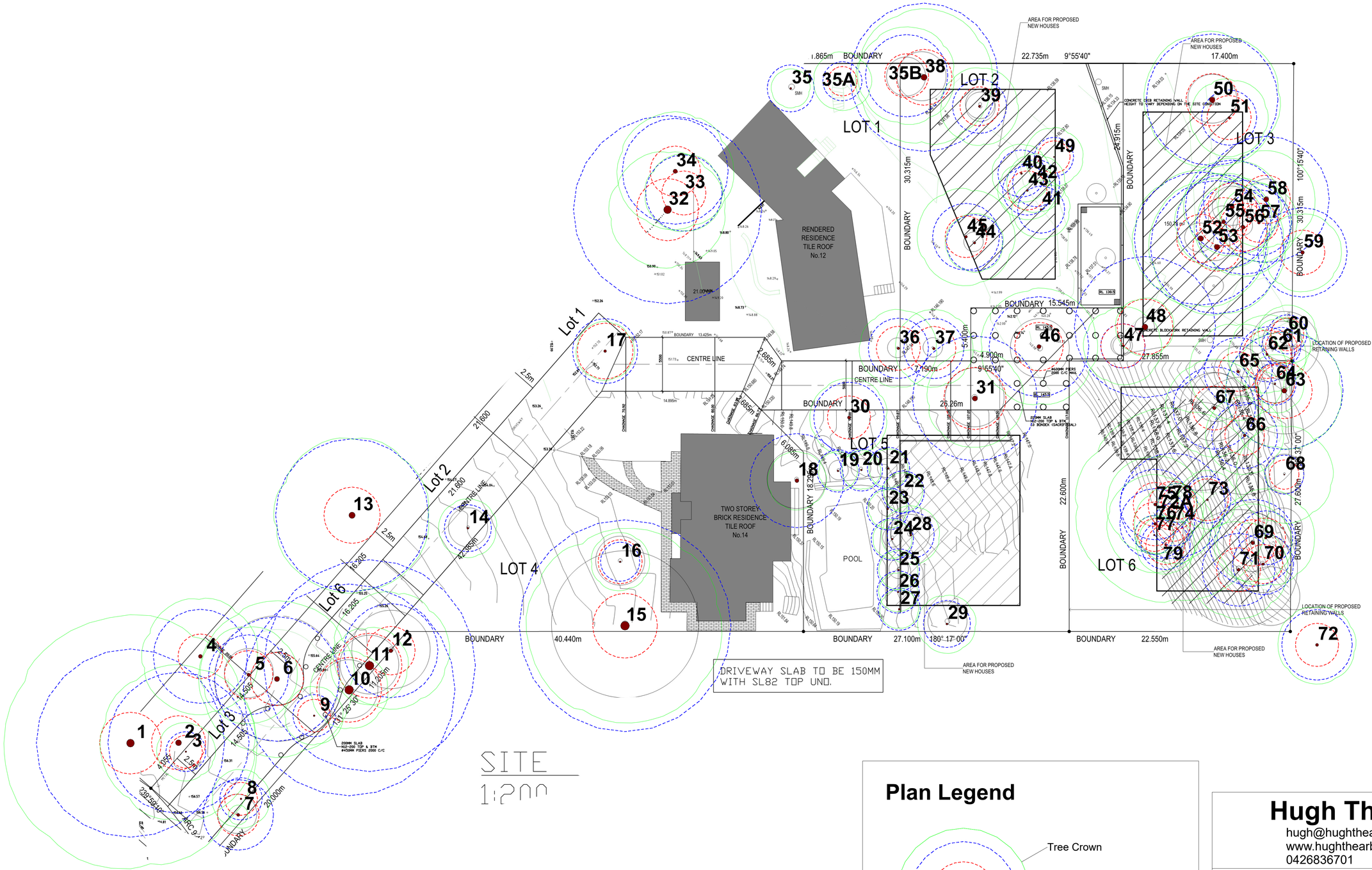
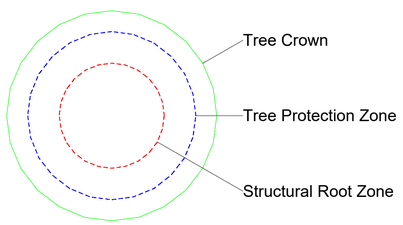


SITE
1:200

Plan Legend



0 30m

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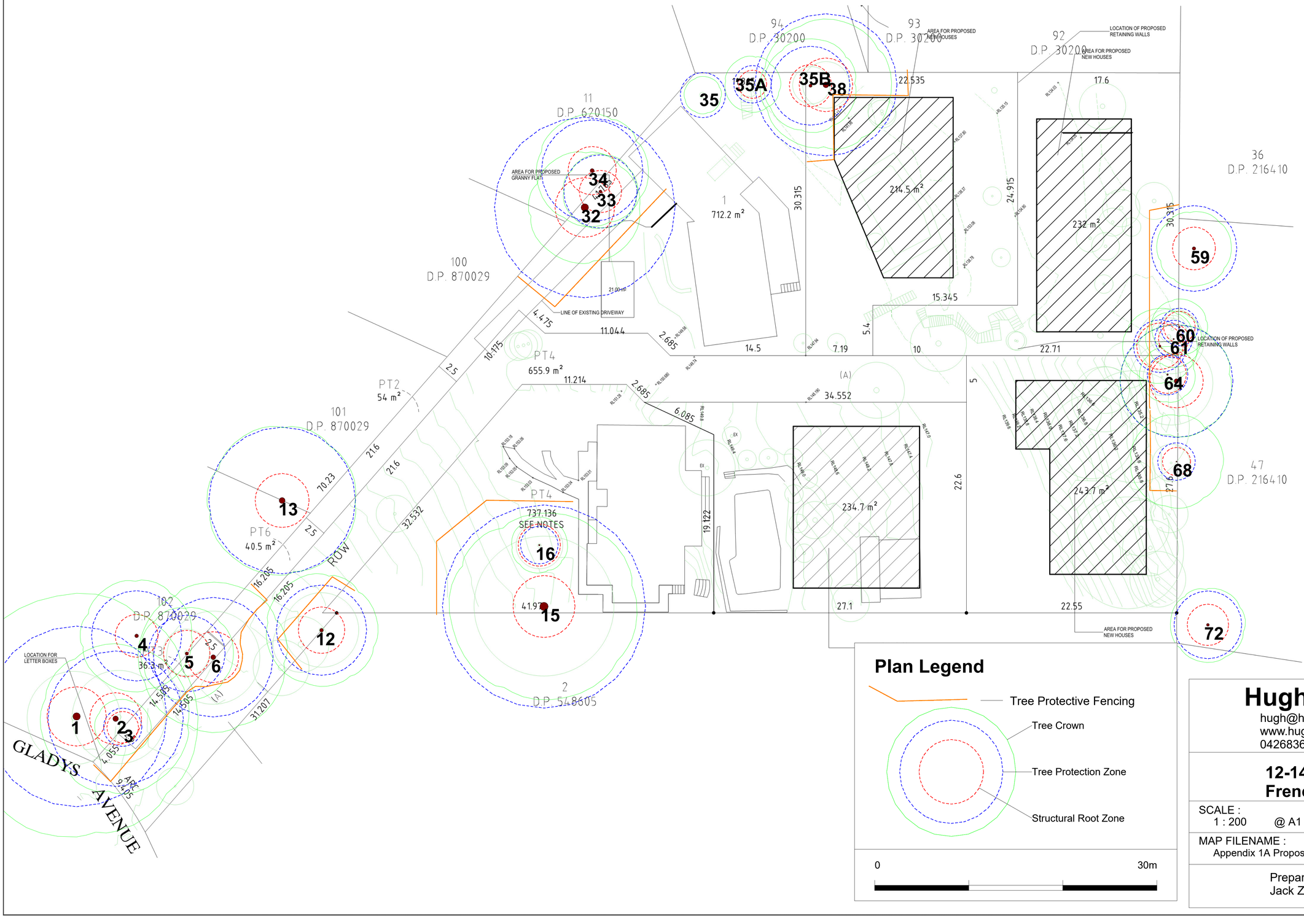
SCALE : 1 : 200 @ A1

DATE : 16/08/2019

MAP FILENAME : Appendix 1 Proposed Site Plan

HUGH THE ARBORIST

Prepared by Hugh Millington for Jack Zhang



Plan Legend

- Tree Protective Fencing
- Tree Crown
- Tree Protection Zone
- Structural Root Zone

0 — 30m

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SCALE : 1 : 200 @ A1

DATE : 16/08/2019

MAP FILENAME : Appendix 1A Proposed Tree Protection Plan

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Prepared by Hugh Millington for Jack Zhang

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1 (mm)	Stem 2 (mm)	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	Smooth Barked Apple	*Angophora costata*	Mature	19	13	800		800	890	Good	Good	Very High	1. Long	AA1	9.6	3.2	Neighboring tree.
2	Smooth Barked Apple	*Angophora costata*	Mature	16	8	600		600	650	Good	Good	Very High	1. Long	A1	7.2	2.8	Neighboring tree.
3	Red Mahogany	*Eucalyptus resinifera*	Semi-mature	8	3	170		170	200	Good	Good	High	1. Long	A1	2.0	1.7	None.
4	Smooth Barked Apple	*Angophora costata*	Mature	15	6	400		400	410	Good	Good	High	1. Long	A1	4.8	2.3	Neighboring tree.
5	Red Mahogany	*Eucalyptus resinifera*	Mature	11	5	340		340	500	Good	Good	High	1. Long	A1	4.1	2.5	Neighboring tree.
6	Smooth Barked Apple	*Angophora costata*	Mature	16	8	530		530	620	Good	Good	Very High	1. Long	AA1	6.4	2.7	Slight drying of cambium in upper crown.
7	Italian Cypress	*Cupressus sempervirens*	Mature	8	1	300		300	350	Fair	Fair	Low	2. Medium	Z3	3.6	2.1	Exempt species.
8	Lawsons Cypress	*Chamycyparis lawsoniana*	Mature	7	3	180		180	200	Good	Good	Low	2. Medium	Z3	2.2	1.7	Lawson's exempt species.
9	Lawsons Cypress	*Chamycyparis lawsoniana*	Mature	7	3	180		180	200	Good	Good	Low	2. Medium	Z3	2.2	1.7	Lawson's exempt species.
10	Monterey Cypress	*Cupressus macrocarpa*	Mature	14	4	900		900	1000	Fair	Fair	Low	2. Medium	Z3	10.8	3.3	Exempt species.
11	Monterey Cypress	*Cupressus macrocarpa*	Mature	14	4	900		900	1000	Fair	Fair	Low	2. Medium	Z3	10.8	3.3	Exempt species.
12	Smooth Barked Apple	*Angophora costata*	Mature	16	6	400		400	500	Fair	Poor	Medium	3. Short	Z10	4.8	2.5	Neighboring tree. Cambial damage on trunk.
13	Smooth Barked Apple	*Angophora costata*	Mature	10	8	650		650	710	Good	Good	Very High	1. Long	A1	7.8	2.9	Neighboring Tree.
14	Cocos Palm	*Syagrus romanzoffianum*	Mature	9	3	200		200	0	Good	Good	Low	1. Long	Z3	2.4	0.0	Exempt species.
15	Sweetgum	*Liquidamber styraciflua*	Mature	15	10	900		900	990	Good	Good	Medium	1. Long	Z3	10.8	3.3	Exempt species.
16	Crepe Myrtle	*Lagerstroemia indica*	Mature	5	3	80	80	160	400	Good	Good	Low	1. Long	Z3	2.0	2.3	Exempt species.
17	Weeping Bottlebrush	*Callistemon viminalis*	Mature	7	3	210	150	277	700	Good	Good	Medium	1. Long	A1	3.3	2.8	None.
18	Mexican Fan Palm	*Washingtonia robusta*	Mature	16	3	400		400	0	Good	Good	Medium	1. Long	Z3	4.8	0.0	Exempt species.
19	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
20	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
21	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
22	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
23	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
24	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
25	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
26	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
27	Bangalow Palm	*Archontophoenix cunninghamiana*	Semi-mature	6	2	180		180	0	Good	Good	Low	1. Long	Z3	2.2	0.0	Exempt species.
28	Cocos Palm	*Syagrus romanzoffianum*	Mature	6	3	200		200	0	Good	Good	Low	1. Long	Z3	2.4	0.0	Exempt species.
29	Cocos Palm	*Syagrus romanzoffianum*	Mature	6	3	200		200	0	Good	Good	Low	1. Long	Z3	2.4	0.0	Exempt species.
30	Illawara Flame	*Brachychiton acerifolius*	Mature	8	4	300		300	380	Good	Good	Medium	1. Long	Z3	3.6	2.2	Exempt species.
31	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	9	5	400	350	532	900	Fair	Poor	Medium	3. Short	Z4	6.4	3.2	Internal decay at base. Canopy sparse.
32	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	11	6	800		800	900	Good	Good	High	1. Long	A1	9.6	3.2	None.
33	Illawara Flame	*Brachychiton acerifolius*	Mature	10	4	230	230	325	400	Good	Good	Medium	1. Long	Z3	3.9	2.3	Exempt species.
34	Casuarina	*Casuarina Spp*	Mature	15	6	450		450	550	Good	Good	Very High	1. Long	AA1	5.4	2.6	Neighboring tree.
35	Bangalow Palm	*Archontophoenix cunninghamiana*	Mature	10	2	200		200	0	Good	Good	Low	1. Long	Z3	2.4	0.0	Exempt species.
35A	Macadamia	*Macadamia Spp.*	Mature	6	3	100		100	150	Good	Good	Medium	1. Long	A2	2.0	1.5	X 3 trees.
35B	African Olive	*Olea europaea subsp. cuspidata*	Mature	9	5	350		350	400	Good	Good	Low	1. Long	Z3	4.2	2.3	Exempt species.
36	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	6	4	160	200	256	400	Poor	Poor	Low	3. Short	Z10	3.1	2.3	Tree in severe decline.
37	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	9	4	160	200	256	400	Poor	Poor	Low	3. Short	Z10	3.1	2.3	Tree in severe decline.
38	Lilly Pilly	*Acmena smithii*	Mature	11	7	630		630	700	Good	Good	High	1. Long	A1	7.6	2.8	Bark inclusion between stems, partially fused.
39	Blue Jacaranda	*Jacaranda mimosifolia*	Mature	6	4	230		230	300	Good	Fair	Low	1. Long	Z3	2.8	2.0	Exempt species.
40	Cocos Palm	*Syagrus romanzoffianum*	Mature	8	3	200		200	0	Good	Good	Low	1. Long	Z3	2.4	0.0	Exempt species.
41	Cocos Palm	*Syagrus romanzoffianum*	Mature	8	3	200		200	0	Good	Good	Low	1. Long	Z3	2.4	0.0	Exempt species.
42	Cocos Palm	*Syagrus romanzoffianum*	Mature	8	3	200		200	0	Good	Good	Low	1. Long	Z3	2.4	0.0	Exempt species.
43	Coastal Banksia	*Banksia integrefolia*	Mature	10	3	210		210	300	Good	Fair	Medium	2. Medium	A2	2.5	2.0	May have been lopped in the past. Mature epicormic canopy structure.
44	Cocos Palm	*Syagrus romanzoffianum*	Mature	11	3	240		240	0	Good	Good	Low	1. Long	Z3	2.9	0.0	Exempt species.

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1 (mm)	Stem 2 (mm)	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
45	Port Jackson Fig	*Ficus rubiginosa*	Mature	5	5	220	180	284	350	Good	Fair	Medium	2. Medium	A2	3.4	2.1	Beetles Growing out of rock, has been lopped in the past.
46	Red Mahogany	*Eucalyptus resinifera*	Mature	12	6	300	300	424	500	Fair	Good	Medium	2. Medium	A2	5.1	2.5	Canopy slightly sparse.
47	Blue Jacaranda	*Jacaranda mimosifolia*	Mature	8	4	160	100	189	400	Good	Good	Low	1. Long	Z3	2.3	2.3	Exempt species.
48	Lawsons Cypress	*Chamycyparis lawsoniana*	Mature	17	3	600		600	700	Good	Good	Medium	1. Long	Z3	7.2	2.8	Lawson's Exempt species.
49	Coastal Banksia	*Banksia integrefolia*	Mature	8	3	110		110	190	Good	Good	Medium	1. Long	A1	1.3	1.6	None.
50	Grey Gum	*Eucalyptus punctata*	Mature	13	7	560		560	600	Good	Poor	High	6. Unstable	Z5	6.7	2.7	Heavy lean to north west. Cambium decay on trunk. Transverse crack on tension side of lean considered partially failed. Owner to be notified, tree orientated towards neighboring garden.
51	Blue Jacaranda	*Jacaranda mimosifolia*	Mature	6	4	150	150	235	400	Good	Good	Low	1. Long	Z3	2.8	2.3	Exempt species.
52	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	13	7	400	400	566	500	Good	Good	High	1. Long	A1	6.8	2.5	Forms part of group.
53	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	13	7	400	400	566	500	Good	Good	High	1. Long	A1	6.8	2.5	Forms part of group.
54	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	13	5	400		400	500	Good	Good	High	1. Long	A1	4.8	2.5	Measurement averaged. Part of group.
55	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	13	5	400		400	500	Good	Good	High	1. Long	A1	4.8	2.5	Measurement averaged. Part of group.
56	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	13	5	400		400	500	Good	Good	High	1. Long	A1	4.8	2.5	Measurement averaged. Part of group.
57	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	10	4	280		280	300	Good	Good	High	1. Long	A1	3.4	2.0	Part of group.
58	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	13	5	330	300	537	500	Good	Good	High	1. Long	A1	6.4	2.5	Part of group.
59	Broad Leaved Paperbark	*Melaleuca quinquenervia*	Mature	8	4	380		380	410	Good	Good	High	1. Long	A1	4.6	2.3	Neighboring tree.
60	Blue Jacaranda	*Jacaranda mimosifolia*	Mature	5	3	150		150	200	Good	Good	Low	1. Long	Z3	2.0	1.7	Exempt species.
61	Red Ironbark	*Eucalyptus sideroxlyon*	Semi-mature	5	3	140		140	180	Fair	Fair	Low	3. Short	Z10	2.0	1.6	Suppressed, conflicting with other trees and minor decline.
62	Old Man Banksia	*Banksia serrata*	Mature	5	4	150	180	234	500	Good	Good	High	1. Long	A1	2.8	2.5	None.
63	Sydney Peppermint	*Eucalyptus piperita*	Mature	12	6	500		500	700	Good	Good	High	1. Long	A1	6.0	2.8	Tree leans to the north.
64	Old Man Banksia	*Banksia serrata*	Mature	5	3	180		180	300	Good	Good	High	1. Long	A1	2.2	2.0	None.
65	Smooth Barked Apple	*Angophora costata*	Mature	6	5	290		290	310	Fair	Poor	Low	3. Short	Z10	3.5	2.0	Heavy lean to north. May have partially failed.
66	Smooth Barked Apple	*Angophora costata*	Mature	12	4	280		280	310	Fair	Good	High	2. Medium	A2	3.4	2.0	Large dead wood in canopy. Some drying of the cambium on main stem.
67	Smooth Barked Apple	*Angophora costata*	Mature	14	5	350		350	400	Fair	Fair	High	2. Medium	A2	4.2	2.3	Canopy sparse. Dry bark and splits on trunk, minor.
68	Sydney Peppermint	*Eucalyptus piperita*	Young	6	5	120		120	150	Fair	Poor	Low	3. Short	Z10	2.0	1.5	Heavy lean to north. No apical leader formed.
69	Old Man Banksia	*Banksia serrata*	Mature	8	4	370		370	450	Good	Fair	Medium	1. Long	A2	4.4	2.4	None.
70	Old Man Banksia	*Banksia serrata*	Mature	6	0	260		260	300	Good	Fair	Medium	2. Medium	A2	3.1	2.0	Heavy Lean to north.
71	Sweet Pittosporum	*Pittosporum undulatum*	Mature	8	5	310		310	400	Good	Good	Medium	2. Medium	A1	3.7	2.3	None.
72	Old Man Banksia	*Banksia serrata*	Mature	5	4	300		300	380	Good	Good	High	1. Long	A1	3.6	2.2	Neighboring tree.
72A	Red Mahogany	*Eucalyptus resinifera*	Mature	17	10	448		448	510	Good	Good	High	1. Long	A1	5.4	2.5	None.
73	Old Man Banksia	*Banksia serrata*	Mature	5	3	200		200	350	Good	Fair	High	1. Long	A2	2.4	2.1	None.
74	Swamp Oak	*Casuarina glauca*	Mature	10	4	180		180	210	Fair	Good	Low	2. Medium	A1	2.2	1.7	Suppressed.
75	Camphor Laurel	*Cinnamomum camphora*	Mature	10	5	300		300	400	Good	Good	Low	1. Long	Z3	3.6	2.3	Exempt species.
76	Camphor Laurel	*Cinnamomum camphora*	Mature	10	5	300		300	400	Good	Good	Low	1. Long	Z3	3.6	2.3	Exempt species.
77	Sweet Pittosporum	*Pittosporum undulatum*	Mature	8	2	150		150	200	Fair	Good	Medium	2. Medium	A2	2.0	1.7	None.
78	Sweet Pittosporum	*Pittosporum undulatum*	Mature	8	2	150		150	200	Fair	Good	Medium	2. Medium	A2	2.0	1.7	None.

Appendix 2 - Tree Inspection Schedule

Tree ID	Common Name	Botanical Name	Age Class	Height (m)	Canopy Spread Radius (m)	Stem 1 (mm)	Stem 2 (mm)	DBH (mm)	DAB (mm)	Health	Structure	Amenity Value	SULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	Notes
79	Illawara Flame	*Brachychiton acerifolius*	Mature	10	3	210		210	300	Fair	Good	Low	1. Long	Z3	2.5	2.0	None.

Explanatory Notes

Tree Species - Botanical name followed by common name in brackets. 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), Dead (D).
Diameter at Breast Height (DBH) - Measured with a DBH tape or estimated at approximately 1.4m above ground level. Where DBH has been estimated it is indicated with an 'est'. The (1) in
Diameter Above root Buttresses (DAB): Measured with a DBH tape or estimated above root buttresses (DAB) for calculating the SRZ.
Height - Height from ground level to top of crown. All heights are estimated unless otherwise indicated.
Spread - Radius of crown at widest section. All tree spreads are estimated unless otherwise indicated.
Tree Protection Zone (TPZ) - DBH x 12. Measured in radius from the centre of the trunk. Rounded to nearest 0.1m. For monocots, the TPZ is set at 1 metre outside the crown projection.
Structural Root Zone (SRZ) - $(DAB \times 50)^{0.42} \times 0.64$. Measured in radius from the centre of the trunk. Rounded up to nearest 0.1m.
Health - Good/Fair/Poor
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.

Appendix 3 – Condition/Overall health

Category	Example condition	Summary
Good	• Crown has good foliage density for species. • Tree shows no or minimal signs of pathogens that are unlikely to have an effect on the health of the tree. • Tree is displaying good vigour and reactive growth development. • Branch unions appear to be strong with no sign of defects. • There are no significant cavities. • The tree is unlikely to fail in usual conditions. • The tree has a balanced crown shape and form.	• The tree is in above average health and condition and no remedial works are required. • The tree is considered structurally good with well developed form.
Fair	• The tree may be starting to dieback or have over 25% deadwood. • Tree may have slightly reduced crown density or thinning. • There may be some discolouration of foliage. • Average reactive growth development. • There may be early signs of pathogens which may further deteriorate the health of the tree. • There may be epicormic growth indicating increased levels of stress within the tree. • The tree may have minor structural defects within the structure of the crown that 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 is in below average health and condition and may require remedial works to improve the trees health. • The identified defects are unlikely cause major failure. • Some branch failure may occur in usual conditions. • Remedial works can be undertaken to alleviate potential defects.
Poor	• The may be in decline, have extensive dieback or have over 30% deadwood. • The canopy may be sparse or the leaves may be unusually small for species. • Pathogens or pests are having a significant detrimental effect on the tree health. • The tree has significant structural defects. • Branch unions may be poor or weak. • The tree may have a cavity or cavities with excessive levels of decay that could cause catastrophic failure. • The tree may have root damage or is displaying signs of recent movement.	• The tree is displaying low levels of health and removal or remedial works may be required. • The identified defects are likely to cause either partial or whole failure of the tree.

	• The tree crown may have poor weight distribution which could cause failure.	
Dangerous	• The tree is dead or almost dead. • The tree is an imminent danger to people or property.	• The tree should generally be removed.

Appendix 4 - Tree Protection Zone (TPZ)

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 TPZ incorporates the structural root zone (SRZ).

Determining the TPZ

The radius of the TPZ is calculated for each tree by multiplying its DBH × 12.

TPZ = DBH × 12

Where

DBH = trunk diameter measured at 1.4 m above ground

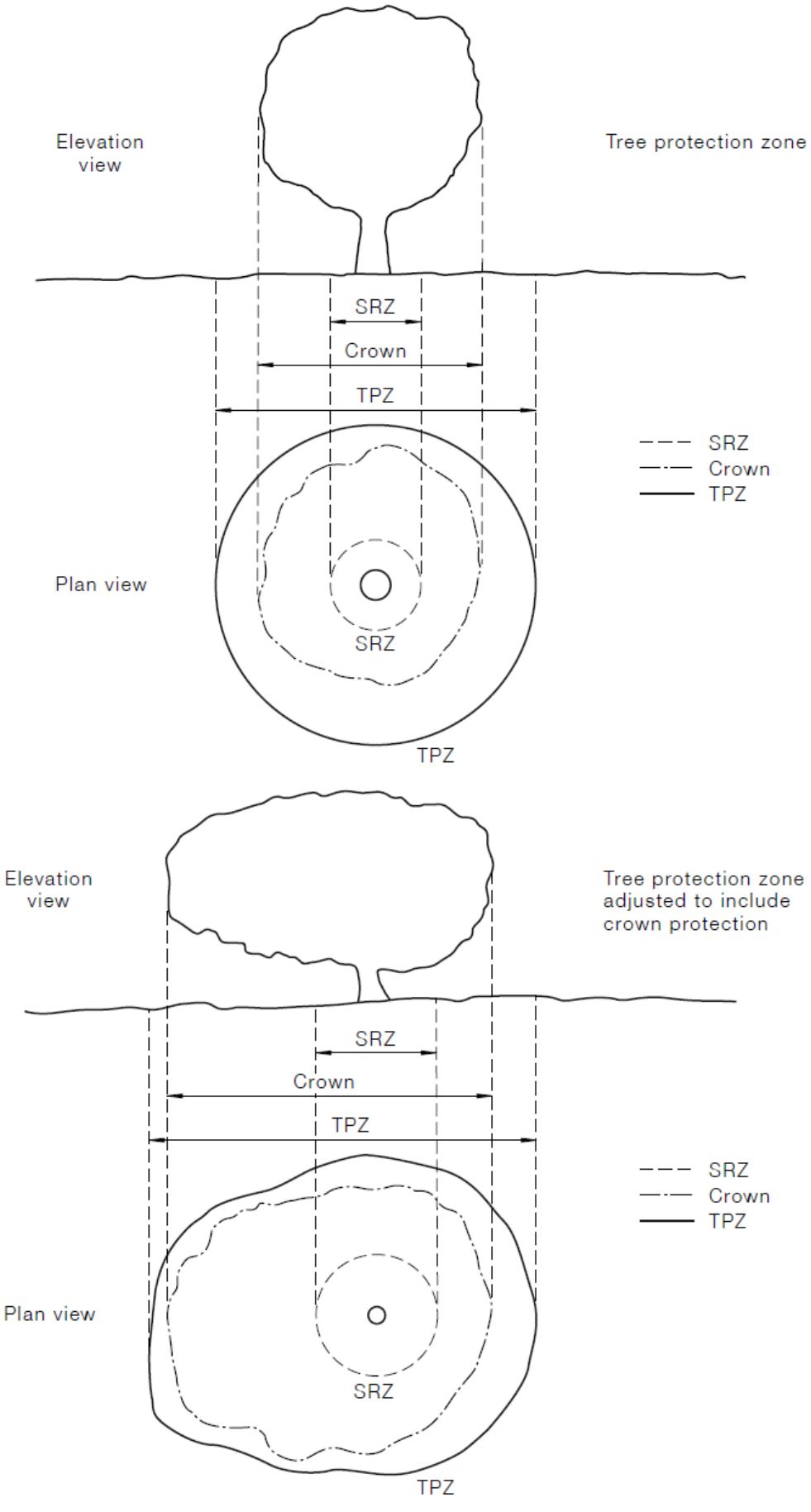
Radius is measured from the centre of the stem at ground level.
A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required).

Minor encroachment into the TPZ

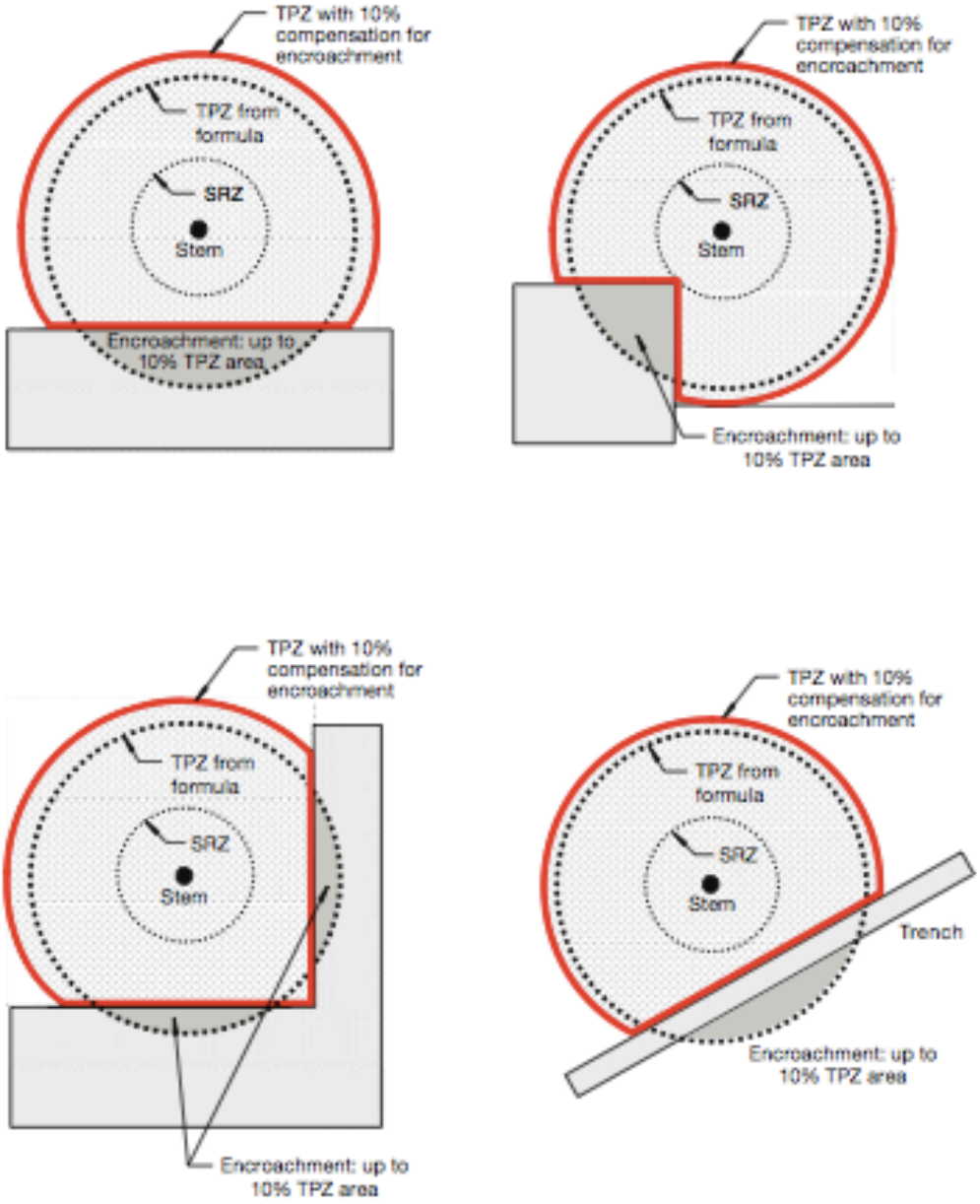
Where encroachment into the TPZ is unavoidable it is generally accepted that encroachment of under 10% of the total TPZ is possible without carrying out detailed root investigations. This minor loss of root area is normally compensated by the roots developing elsewhere.

Major encroachment into the TPZ

If an encroachment of more than 10% is proposed into the TPZ it would be necessary to demonstrate that the tree would remain viable. None destructive root investigations may be required to determine any potential impact the encroachment may have on the tree.


Elevation view
Tree protection zone
SRZ
Crown
TPZ
SRZ
Crown
TPZ
Plan view
SRZ
TPZ
Elevation view
Tree protection zone adjusted to include crown protection
SRZ
Crown
TPZ
SRZ
Crown
TPZ
Plan view
SRZ
TPZ

Encroachment into the tree protection zone (TPZ) is sometimes unavoidable. Figure D1 provides examples of TPZ encroachment by area, to assist in reducing the impact of such incursions.



NOTE: Less than 10% TPZ area and outside SRZ. Any loss of TPZ compensated for elsewhere.

Appendix 5 - 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 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.

Determining the SRZ

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

SRZ radius = $(D \times 50)^{0.42} \times 0.64$

where

D = trunk diameter in m, measured above the root buttress.

Note - The SRZ for trees with trunk diameters less than 0.15 will be 1.5m.

Appendix 6 - Amenity value

To determine the amenity value of a tree we assess a number of different factors which include but are not limited to the information below.

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

Appendix 7 - Age class

If 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.

Category	Description
Young/Newly planted	• Young or recently planted tree.
Semi Mature	• Up to 20% of the usual life expectancy for the species.
Early mature/Mature	• Between 20% - 80% of the usual life expectancy for the species.
Over mature	• Over 80% of the usual life expectancy for the species.
Dead	• Tree is dead or almost dead.

Appendix 8 - Structural condition

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

Appendix 9 - 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.

TreeAZ Categories (Version 10.04-ANZ)

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

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

Local policy exemptions: Trees that are unsuitable for legal protection for local policy reasons including size, proximity and species	
Z1	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
Z2	Too close to a building, i.e. exempt from legal protection because of proximity, etc
Z3	Species that cannot be protected for other reasons, i.e. scheduled noxious weeds, out of character in a setting of acknowledged importance, etc
High risk of death or failure: Trees that are likely to be removed within 10 years because of acute health issues or severe structural failure	
Z4	Dead, dying, diseased or declining
Z5	Severe damage and/or structural defects where a high risk of failure cannot be satisfactorily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, overgrown and vulnerable to adverse weather conditions, etc
Z6	Instability, i.e. poor anchorage, increased exposure, etc
Excessive nuisance: Trees that are likely to be removed within 10 years because of unacceptable impact on people	
Z7	Excessive, severe and intolerable inconvenience to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. dominance, debris, interference, etc
Z8	Excessive, severe and intolerable damage to property to the extent that a locally recognized court or tribunal would be likely to authorize removal, i.e. severe structural damage to surfacing and buildings, etc
Good management: Trees that are likely to be removed within 10 years through responsible management of the tree population	
Z9	Severe damage and/or structural defects where a high risk of failure can be temporarily reduced by reasonable remedial care, i.e. cavities, decay, included bark, wounds, excessive imbalance, vulnerable to adverse weather conditions, etc
Z10	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
Z11	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
Z12	Unacceptably expensive to retain, i.e. severe defects requiring excessive levels of maintenance, etc

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

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

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

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