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Arboricultural Impact Assessment Report

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Report Summary

This report has been commissioned by L. Anglicas to assess two adjoining sites 143 and 145 McCarrs Creek Road in Church Point.
The proposal consists of two separate dwellings with ancillary structures that will be submitted as one development application. For this reason, and the high number of trees assessed for each site, a report has been prepared for both 143 and 145 McCarrs Creek Road.
The tree survey data and tree tagging corresponds over both sites and 99 individual trees have been assessed, one tree (T5) has been removed from the report and is discussed in the scope.
Two communities of trees have been assessed as groups as they have not been recorded on the survey plans provided, one at the higher eastern side of the site and one in the lower gully (west) of the site.
The sites currently have no existing structures located on them. They contain a multitude of native trees and vegetation that has been described in the independent ecological report as;

'The lower south-western corner of the site is considered to contain Littoral Rainforest Endangered Ecological Community. it was determined that the site contains 2 PCTs, Lilly-Pilly- Cabbage Tree Palm Littoral Rainforest on escarpment slopes and gullies in the Sydney Basin (Littoral Rainforest Endangered Ecological Community PCT 1833), and Turpentine-Rough-barked Apple-forest Oak Moist Shrubby tall open forest of the Central Coast (Central Coast Escarpment Moist Forest PCT 1565).'

The site is heavily sloped from east to west and contains multiple natural rock shelves and floaters. The proposal to construct a dwelling on 145 McCarrs Creek Road has been on steel piers utilising the existing rock as footings where possible with some excavation proposed to the rear of the dwelling.
This has reduced the level of impact for the surrounding trees at the front of the dwelling however the tees that are located within the footprint of the proposed dwelling and have been recommended for removal. Trees closer to the rear of the dwelling will be subject to higher impacts due to the proposed excavation. The proposed driveway and garage will also require excavation into the slope at the lower western end of the site.
Fifty trees have been assessed on site 145. Nineteen trees have been recommended for removal, of these fourteen are high value category A trees and five are lower value category Z trees.
The remaining thirty one trees are proposed to be retained as are the two groups of trees at the top and bottom of the site.

Tree protection on a very steep site requires modification to the standard fencing to isolate tree protection zones. It has been recommended that a robust sediment fence be installed consisting of a fence installed with star pickets to allow a taller barrier with coir logs installed on the high sides. Two locations have been proposed for this sediment control and are detailed in the tree protection plan section. Trunk protection has been recommended for trees within close proximity to the development area, 1.8m galvanised fencing is likely to become a site hazard and has not been recommended. The materials proposed are lightweight and the access to the top of the site with machinery is limited. On the provision the structures are installed without damaging the surrounding area, the proposal is generally of low impact and the integrity of the tree communities can be retained.

Table of Contents

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1. INTRODUCTION

1.1 This report has been commissioned by Luke Anglicas to assess trees located on and adjoining the site that may be impacted by a proposed development.

1.2 The following table contains all documents and information provided to me by the client.

Table 1: documents provided for the assessment

Title	Author	Date	Reference on document
Survey Plan	Stutchbury Jaques	8/7/2019	10501/19
Proposed new dwelling (143 and 145)	Peter Princi Architects	August 2019	DA01
Driveway Engineering detail	M. Benitey	October 2019	SD1908-005
Overview of both sites, proposal and survey plan	Peter Princi Architects	August 2019	Not Stated
Ecological site description and species list	GIS Consultants	14th October 2019	Page 34

1.3 Tree and site data was collected over two days, 2nd and 3rd October 2019. Access was available to the subject site, and adjoining public areas only. All data was collected during these visits, the weather st the time of the inspection was fine with average visibility.

1.4 Trees located within the site boundaries have been identified with a numbered silver dog tag that corresponds to the tree inspection schedule and the site plans prepared for this report.

1.5 Neighbouring trees assessed for this report have not been applied a tag to avoid potential conflict however have been included in the numbering system and marked on site plans.

2. SCOPE OF THE REPORT

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

2.1.1 Two separate reports have been prepared for the sites for ease of assessment of the development application. The appendices section will refer to both sites and include all trees.

2.1.2 Due to severe weather conditions prior to the assessment, several trees have failed or been destroyed by storm damage. These trees have not been included as part of the assessment.

2.1.3 Conduct a visual assessment from ground level of trees located on and adjoining the site that have been identified on the survey plan provided.

2.1.4 For the purpose of this assessment a 'tree' is greater than 5 metres in height and 5 metres canopy diameter have been included in this report only.

2.1.5 Trees and vegetation less than 5 meters in height that feature on survey plans provided have not been included in this assessment.

2.1.6 High value Grass trees and small monocots will be recommended for transplanting and have not been individually assessed.

2.1.7 Dead and failed trees have not been included in the assessment.

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

2.1.9 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).

2.1.10 Recommend methods to mitigate development impacts where appropriate.

2.1.11 A detailed Ecological report has been prepared for the site by an Ecologist. This report will focus on the impact of the development on the subject trees only and will not take into account ecological values.

2.1.12 Due to the vegetation community on site it is considered that all category A1 trees potentially hold the value of category A4 as well.[1]

2.1.13 Recommend tree protection measures for any tree to be retained in accordance with AS4970 Protection of Trees on Development Sites - 2009.

[1] Barrell Tree Consultancy, *Tree AZ version 10.10-ANZ*, http://www.treeaz.com/.

3. LIMITATIONS

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

3.2 Storm water and services plans have not been provided for the purpose of this assessment.

3.3 Vegetation communities at the top and bottom of the site have not been included in the survey plan or site plans. Their location has been estimated and the description of the communities have been taken from the Ecological report.

3.4 No fixed structures or physical boundaries were available on site. All tree locations have been marked on site pans using the central surveyor's nails in rock and drill holes in rocks where available.

3.5 All observations were carried out from ground level. No detailed additional testing was carried out on trees or soil on site and none of the surrounding surfaces were lifted for investigation.

3.6 Access was not available to several neighbouring trees, these trees dimensions have been estimated from within the property boundary.

3.7 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.

3.8 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.

3.9 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.

3.10 All diagrams, plans and photographs included in this report are visual aids only, and are not to scale unless otherwise indicated.

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

3.12 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.

3.13 Where trees are stated as retainable under the current proposal, this will only be possible if all recommendations and specifications are followed with consultation with the Project Arborist.

3.14 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.

3.15 Several trees assessed have not featured on the plans provided. Their locations have been estimated using available setbacks collected on site and plotted on a scaled site plan.

3.16 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).

4.2 Tree common name

4.3 Tree botanical name

4.4 Tree age class

4.5 DBH (Trunk/Stem diameter at breast height/1.4m above ground level) - millimetres.

4.6 Estimated height - metres

4.7 Estimated crown spread (Radius of crown) - metres

4.8 Health

4.9 Structural condition

4.10 Amenity value

4.11 Estimated remaining contribution years (SULE)[2]

4.12 Retention value (Tree AZ)[3]

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

4.13 Notes/comments

4.14 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer, 1994).[4]

4.15 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 and a Leica DistoD410 digital laser tape.

4.16 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) [5] and in some cases estimated. See appendices for information.

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

5. SITE LOCATION AND BRIEF DESCRIPTION OF PROPOSAL

5.1 The site is located in the suburb of Church Point, New South Wales, which is located in the Northern Beaches Council area. All trees at the site are subject to protection under the following policy and legislation;

5.1.1 Pittwater Local Environmental Plan (LEP) 2014[6]

5.1.2 Pittwater 21 Development Control Plan (DCP) 2014.[7]

5.1.3 State Environmental Planning Policy (Vegetation in Non-Rural Areas 2017).

5.1.4 Threatened Species Conservation Act 1995

5.2 The following information and site description has been taken from the Ecological report prepared by GIS Environmental Consultants.

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[3] Barrell Tree Consultancy, *Tree AZ version 10.10-ANZ*, http://www.treeaz.com/.

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

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

[6] *Pittwater Local Environmental Plan 2014* https://legislation.nsw.gov.au/#/view/EPI/2014/320/historical2017-08-25/full.

[7] *Pittwater 21 Development Control Plan,* https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/pages/plan/book.aspx?exhibit=PDCP, accessed 29 October 2018.

5.3 The lower south-western corner of the site is considered to contain Littoral Rainforest Endangered Ecological Community. it was determined that the site contains 2 PCTs, Lilly-Pilly- Cabbage Tree Palm Littoral Rainforest on escarpment slopes and gullies in the Sydney Basin (Littoral Rainforest Endangered Ecological Community PCT 1833), and Turpentine-Rough-barked Apple-forest Oak Moist Shrubby tall open forest of the Central Coast (Central Coast Escarpment Moist Forest PCT 1565).

Tile 1: Site location[8] (no physical boundary between sites)

5.4 The site is steep with the lower section on the western side adjoining McCarrs Creek Road. A series of natural rock shelves and steep sections present throughout the site. The top of the site is assumed to have a shallow soil profile due to the level of exposed rock.

5.5 The proposal consists of the construction of a residential dwelling, a driveway and garage/carport with an inclinator leading to the house.

[8] https://maps.six.nsw.gov.au/

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

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

6.2 **Site plan:** Appendix 1 contains the proposal showing all the trees on site. Appendix 1a shows the proposal and the trees and the retained trees should the proposal proceed and provides tree protection advice for the development. Appendix 1b shows all trees across both sites.

6.3 All plans have overlaid the indicative TPZ and SRZ of each tree. Appendix 1a provides an overview less the trees recommended for removal and offers site management and tree protection advice.

6.4 **Tree protection zone (TPZ)**: The TPZ is 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 AS4970-2009 to be the extent 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 tree protection also incorporates the SRZ (see below for more information about the SRZ). I have calculated the TPZ of palms, other monocots, cycads and tree ferns at one metre outside the crown projection. In appendix 4 I have included additional information about the TPZ including information about calculating the TPZ and examples of TPZ encroachment.

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. 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 appendix 5 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.

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.

7. ASSESSEMENT OF CONSTRUCTION IMPACTS

7.1 **Table 2: In the table below I have summarised the impact of proposed development impact to all trees included in the report. As the exact location of all trees has not been identified on the proposed site plans, the TPZ encroachment percentage has been estimated based on the available information.**

Tree ID	Common name	Retention value	TPZ radius (m)	SRZ Radius (m)	TPZ encroachment	Discussion	Conclusion
51	Cabbage Palm	A1	3.0	0.0	Footprint	Tree located within the footprint of the dwelling.	Remove
52	Forest Oak	A1	4.4	2.3	Footprint	Tree located within the footprint of the dwelling.	Remove
53	Forest Oak	Z6	2.4	2.3	None	Tree will not be subject to encroachment but has partially failed and recommended for removal.	Remove
54	Forest Oak	Z10	8.4	3.0	Major	The proposed dwelling occupies up to 40% of the TPZ area and the SRZ. While it is noted the proposal is on piers, the tree has advanced internal decay and has been assessed as having poor architectural framework. The tree has multiple cavities that may be retained as a habitat tree retaining just the trunk.	Remove
55	Forest Oak	A1	2.4	1.9	Footprint	Tree located within the footprint of the dwelling.	Remove
56	Turpentine	A1	3.8	2.3	Footprint	Tree located within the footprint of the dwelling.	Remove
57	Cabbage Palm	A1	3.0	0.0	Footprint	Tree located within the footprint of the dwelling.	Remove
58	Red Mahogany	AA1	5.7	2.6	Major	The proposed dwelling occupies up to 21% of the TPZ area and some of the SRZ. One meter of excavation is proposed on the high side of the site and will require the severance of structural roots. Tree 58 has been identified an unusual species Eucalyptus scias that shares the same common name with another species.	Remove
59	Turpentine	A1	2.5	1.8	None	Tree will not be subject to encroachment.	Retain and protect
60	Forest Oak	Z10	3.8	2.4	None	Tree will not be subject to encroachment.	Retain and protect
61	Turpentine	A1	4.8	3.0	None	Tree will not be subject to encroachment.	Retain and protect
62	Forest Oak	A1	4.3	2.4	None	Tree will not be subject to encroachment.	Retain and protect
63	Turpentine	A2	2.2	1.7	None	Tree will not be subject to encroachment.	Retain and protect

Tree ID	Common name	Retention value	TPZ radius (m)	SRZ Radius (m)	TPZ encroachment	Discussion	Conclusion
64	Turpentine	A1	1.8	1.7	None	Tree will not be subject to encroachment.	Retain and protect
65	Forest Oak	A2	2.0	1.8	None	Tree will not be subject to encroachment.	Retain and protect
66	Forest Oak	A1	4.6	2.5	Minor	Less than 10% encroachment into the TPZ area and none proposed within the SRZ.	Retain and protect
67	Forest Oak	A1	2.7	1.9	Footprint	Tree located within the footprint of the dwelling.	Remove
68	Forest Oak	A1	2.4	1.9	None	Tree will not be subject to encroachment.	Retain and protect
69	Forest Oak	A2	2.2	1.8	None	Tree will not be subject to encroachment.	Retain and protect
70	Cabbage Palm	A1	3.0	0.0	None	Tree will not be subject to encroachment.	Retain and protect
71	Cabbage Palm	A1	3.0	0.0	None	Tree will not be subject to encroachment.	Retain and protect
72	Forest Oak	Z10	10.6	3.4	None	Tree will not be subject to encroachment.	Retain and protect
73	Cabbage Palm	A1	3.0	0.0	None	Tree will not be subject to encroachment.	Retain and protect
74	Cabbage Palm	A1	3.0	0.0	None	Tree will not be subject to encroachment.	Retain and protect
75	Smooth Barked Apple	Z10	3.8	2.4	None	Tree will not be subject to encroachment.	Retain and protect
76	Turpentine	A1	2.0	1.7	None	Tree will not be subject to encroachment.	Retain and protect
77	Forest Oak	A1	1.9	1.9	None	Tree will not be subject to encroachment.	Retain and protect
78	Cabbage Palm	A1	3.0	0.0	None	Less than 5% encroachment into the TPZ and none in the SRZ, this is of low and acceptable impact.	Retain and protect
79	Forest Oak	A1	3.0	2.4	Major	Up to 11% encroachment into the TPZ area from the proposed dwelling piers. No disturbance is proposed within the SRZ. This will be of acceptable impact to the tree.	Retain and protect
80	Forest Oak	A1	2.9	2.0	Footprint	Tree located within the footprint of the dwelling.	Remove

Tree ID	Common name	Retention value	TPZ radius (m)	SRZ Radius (m)	TPZ encroachment	Discussion	Conclusion
81	Cabbage Palm	A1	3.0	0.0	Major	The proposed dwelling occupies up to 50% of the TPZ area and the trunk of the tree is within 300mm of the proposed eaves. A significant volume of the canopy will be required to be removed to facilitate the dwelling. If the tree cannot be provided a greater setback of a minimum 500mm it will require removal. Under the current proposal the tree is not retainable.	Remove or transplant.
82	Forest Oak	A2	7.0	2.8	Footprint	Tree located within the footprint of the dwelling.	Remove
83	Forest Oak	A1	2.8	2.0	Footprint	Tree located within the footprint of the dwelling.	Remove
84	Turpentine	A1	3.8	2.4	Footprint	Tree located within the footprint of the dwelling.	Remove
85	Turpentine	A1	7.3	3.7	Major	The proposed inclinator is set back 5.5m from the tree trunk and extends through 7% of the TPZ area. The proposed dwelling occupies up to 19.2% of the TPZ and some in the SRZ area. All structures are proposed above ground and will retain roots between the piers. In addition, there are several large rocks within the TPZ area and calculated encroachment area that will be used, requiring no excavation. The impact on tree 85 will be of acceptable impact on the provision the rocks are utilized within the TPZ area to foot the piers.	Retain and protect
86	Forest Oak	Z4	2.4	1.9	None	Tree will not be subject to encroachment.	Retain and protect
87	Forest Oak	A1	2.3	1.9	None	Tree will not be subject to encroachment.	Retain and protect
88	Forest Oak	A2	2.3	2.0	Major	The proposed inclinator is set back 1.3m from the tree trunk and extends through 18.3% of the TPZ area. The inclinator will be able to pass the tree and the tree may be retained providing none of the piers required for the inclinator rail are	Retain and protect

Tree ID	Common name	Retention value	TPZ radius (m)	SRZ Radius (m)	TPZ encroachment	Discussion	Conclusion
						within 2 meters of the tree.	
89	Forest Oak	Z10	3.8	2.3	Footprint	Tree located within the proposed footprint of the inclinator.	Remove
90	Turpentine	A1	3.7	2.2	Major	The proposed inclinator is set back 2.1m from the tree trunk and extends through 15% of the TPZ area. The inclinator will be able to pass the tree and the tree may be retained providing none of the piers required for the inclinator rail are within 2.2 meters of the tree.	Retain and protect
91	Forest Oak	A1	3.7	2.3	None	Tree will not be subject to encroachment.	Retain and protect
92	Cabbage Palm	A1	3.0	0.0	Footprint	Tree located within the footprint of the inclinator (it will not be able to pass the trunk).	Remove
93	Turpentine	A1	1.6	1.5	None	Tree will not be subject to encroachment.	Retain and protect
94	Forest Oak	A1	4.4	2.3	None	Tree will not be subject to encroachment.	Retain and protect
95	Forest Oak	A1	4.9	2.5	None	Tree will not be subject to encroachment.	Retain and protect
96	Cabbage Palm	A1	3.0	0.0	None	Tree will not be subject to encroachment.	Retain and protect
97	Turpentine	Z10	11.4	3.7	Footprint	Tree located within the footprint of the inclinator (it will not be able to pass the trunk).	Remove
98	Turpentine	Z10	3.2	3.0	Footprint	Tree located within the footprint of the proposed garage.	Remove
99	Turpentine	A2	4.6	2.3	Footprint	Tree located within the footprint of the proposed garage.	Remove
100	Cabbage Palm	A1	3.0	0.0	Major	Up to 11% encroachment into the TPZ area from the proposed inclinator rail. This will be of acceptable impact to the tree.	Retain and protect
Group 1	Central Coast Escarpment	AA1	N/A	N/A	Minor	Group 1 is located atop of the natural rock shelf at the western side of the site. The group is a community as described in the	Retain and protect

Tree ID	Common name	Retention value	TPZ radius (m)	SRZ Radius (m)	TPZ encroachment	Discussion	Conclusion
	Moist Forest PCT 1565					independent ecological assessment and section 5.3 of this report. No trees will be subject to encroachment as a result of the installation of the structures, however may require some canopy thinning to comply with Bushfire regulations. As a community the development is likely to be of low impact.	
Group 2	Littoral Rainforest Endangered Ecological Community PCT 1833	AA1	N/A	N/A	Major	Group 2 is located at the lower eastern side of the site. The group is a community as described in the independent ecological assessment and section 5.3 of this report. Trees closest to the development have been assessed independently and some have been identified for removal. Given the steep nature of the site, the community will be vulnerable to contamination from site runoff and a detailed sediment control plan is required to be prepared that will withstand the potential pressure of a significant rain event. On the provision this is implemented the development will be of acceptable impact.	Retain and protect

8. CONCLUSIONS

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

Impact	Reason	A	Z
Trees to be removed	Building construction, new surfacing and/or proximity, or trees in poor condition.	51,52,55,56,57,58, 67,80,81, 82,83,84,92,99 (Fourteen Trees)	53,54,89,97,98, (Five Trees)
Retained trees that will be subject to TPZ encroachment	Removal of existing surfacing/structures and/or installation of new surfacing/structures	66,79,85,88,90,100 (Six Trees)	None
Trees to be retained that will not be subject to TPZ encroachment	Space for development	59,61,62,63,64,65,68,69, 70,71,73,74,76,77,78,87, 91,93,94,95,96, (Twenty One Trees)	60,72,75,86, (Four Trees)
Trees requiring further investigation (Root Mapping)	Soil characteristics, topography and level changes within the TPZ	None	None

9. PHOTOGRAPHS

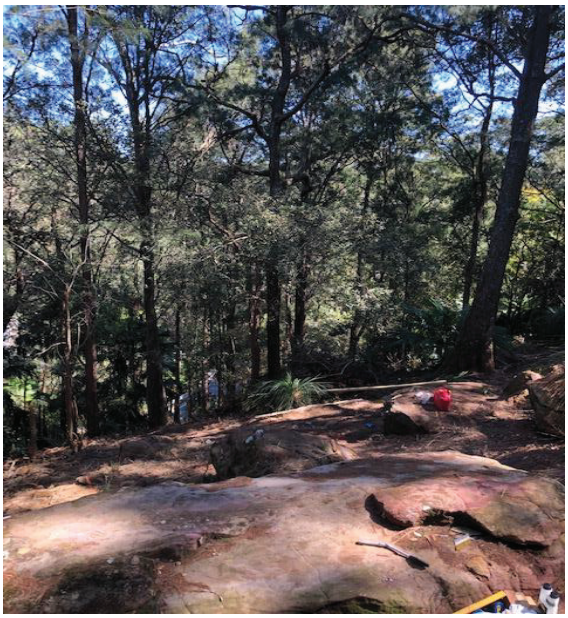

Photo a: Looking to the north of the site where the proposed dwellings are to be constructed.

Photo b: Looking and the existing access and area for the proposed driveway to both sites.

Photo c: Looking up from the west at site 143.

Photo d: Looking to the southern side of the site.

Photo e: Looking east at the top of the site and Group 1.

Photo f: Looking down to the west of the site the area proposed for the garages.

10. RECOMMENDATIONS

10.1 This report assesses the impact of a proposed development at the site to fifty individual trees in accordance with AS4970 Protection of trees on development sites (2009).

10.2 **Refer to the table in section 8 for individual tree identification.**

10.3 Nineteen trees have been recommended for removal to facilitate the development. Of these, fourteen are higher value category A trees. The remaining five trees are lower value category Z trees.

10.4 Six trees will be impacted by the development but are retainable on the provision the recommendations section in this report is implemented. These six are recommended to be retained and protected and all higher value category A trees.

10.5 Twenty Five trees will not be subject to encroachment into the TPZ areas. These trees are also recommended to be retained and protected.

10.6 The main contributing factors of impact requiring the removal of trees are the locations of trees within the footprint of the proposed structures. One metres excavation has been proposed for the eastern higher side of the site and the garage at the bottom of the site. The remaining structures will be constructed above ground on piers.

10.7 **The following recommendations are made to assist with managing a sustainable level of impact for all retained trees on site.**

10.8 All small monocots, Xanthorrhoea and young Cabbage Palms are to be transplanted to another location within the site boundaries.

10.9 **Pier locations** are to be situated on rock above ground where available. All piers are to be located outside the structural root zones of retained trees and the areas bridged or cantilevered. No roots greater than 40mm in diameter are to be damaged or pruned within the structural root zones of retained trees.

10.10 **Pier excavations** are to be carried out manually for the dwelling and the inclinator piers.

10.11 Engineering plans provided for the proposed driveway show up to 1.5 metres of fill to be added to the lowest western sections and from 500mm to 1000mm of grading/cut in the higher western section. It is recommended that the driveway be constructed on piers to reduce the volume of fill and associated battering on the low sections of the access handle. Civil machinery is required to be used under the guidance of the project Arborist and the size of machine be selected to minimise soil erosion to the lower western side of the site.

10.12 Movement of materials is to be manual or using powered barrows which are small and lightweight. It is recommended an access road is constructed to minimise the impact of tracked machinery. Excavators are not to be tracked up and down the site for the movement of material.

10.13 **Excavations for the garage** may be carried out using an excavator only after the high side of the bank has been pruned clear of retained tree roots under the guidance of the Project Arborist.

10.14 **Tree pruning** must be assessed by the project Arborist prior to the commencement of works.

10.15 **Major roots** are considered to be 40 millimetres in diameter or greater and should be allowed 100 millimetres setback from piers to also for future growth.

Roots less than 50 millimetres in diameter should be pruned and documented by the Project Arborist.

10.16 **Storm water services** are to be installed above ground and not involve excavation or the severance of tree roots.

10.17 **Replacement trees** are recommended to consist of native Palm trees and native canopy trees consistent with the specific vegetation group on site. Tree stock is to comply with Australian Standard 2303 Tree Stock for Landscape use (2015). All transplants are to be carried out by an Arborist or Horticulturalist experienced in major tree transplants.

10.18 **Risk assessment** of large trees is recommended to be carried out on a 12 monthly basis. The reason is the occupation rate on site is to become constant.

10.19 **Sediment control** is to be implemented throughout the site.

10.20 **New footpaths and hard surfaces**, 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, manually excavated and retrain roots greater than 40 millimetres in diameter.

10.21 All construction activity is to comply with Australian Standard AS4970 Protection of Trees on Development Sites (2009), sections 7, 10 and 11 of this report.

10.22 No canopy pruning has been recommended for any retained tree to accommodate the development.

10.23 No service or landscaping plan has been assessed as part of this report. 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. Section 4.5.5 of AS4970-2009 says that 'The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees. For manual excavation of trenches the project Arborist should advise on roots to be retained and should monitor the works'.[9]

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

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.

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[9] Council of Standards Australia, *AS 4970 Protection of trees on development sites* (2009) page 18.

11.5 **Table 4: Site Specific Tree Protection Recommendations**

Tree Number	Protection specification
All retained trees	- Sediment fencing to be installed on the western edge of the proposed driveway and be installed using star pickets. - Sediment fencing to be installed on the western side of the proposed dwelling half way up the site. - Coir logs are to be laid on the high side of all sediment fencing. - Sediment fencing is to be regularly checked and maintained throughout construction.
59,60,66,79, 85,86,88,90, 96,100	- Trunk protection recommended.
All trees	- Due to the steep nature of the site, tree protective fencing will be ineffective and a potential site hazard and is not recommended.
All retained trees	- The Project Arborist may assist with substituting tree protective measures as the development progresses. The substitutes must be agreed in writing and be in accordance with AS4970-2009 Protection of Trees on Development Sites.

11.6 **Tree protection Specifications:** 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.

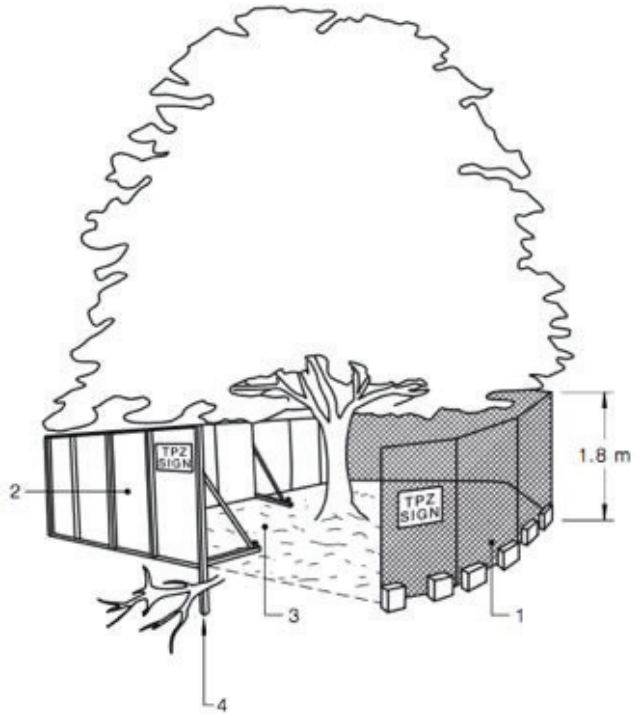
11.8 **TPZ signage:** Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:

- 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.

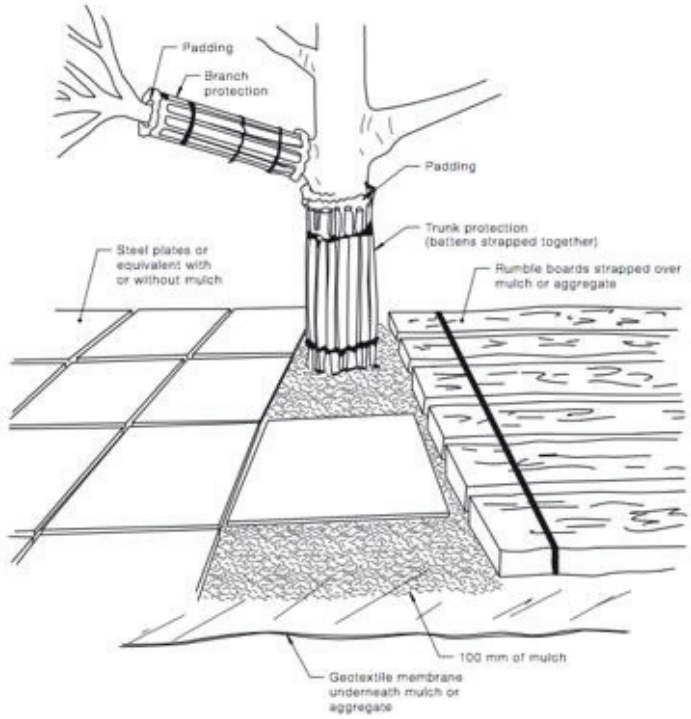
11.11 **Ground Protection:** Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to a depth of between 150-300mm, laid on top of geo textile fabric. 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,[10] with example tree protection.

[10] 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,[11] with example tree protection.

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

11.12 **Root investigations:** Where major TPZ encroachments require demonstrating the viability of trees the following method for root investigations is to be used. Non-destructive excavations are to be carried out along the outer edge of proposed or existing structures within the TPZ (excavation methods include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device). Excavations generally consist of a trench to a depth dictated by the location of significant roots, bedrock, unfavourable conditions for root growth, or the required depth for footings up to 1 metre. The investigation is to be carried out by AQF5 consulting Arborist who is to record all roots greater than 30 millimetres in diameter and produce a report discussing the significance of the findings. No roots 30 millimetres in diameter are to be frayed or damaged during excavation and the trench is to be backfilled as soon as possible to reduce the risk of roots drying out. In the event roots must be left exposed they are to be wrapped in hessian sack and regularly irrigated for the duration of exposure.

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

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

11.14 **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.

11.15 **Excavations and root pruning:** 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).[12] 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.

11.16 **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.

11.17 **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.

11.18 **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.

11.19 **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.

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

11.20 **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.

11.21 **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.

11.22 **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.

11.23 **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 supervise all pruning works to retained trees.	Prior to works commencing	Principal 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. I recommend site inspections on a bi-monthly frequency.	Ongoing throughout the development	Principle contractor	Project Arborist	
Project Arborist to oversee all initial pier excavations 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	
All landscaping works/boundary walls within the TPZ of trees to be retained are to be undertaken in consultation with the project	Landscape	Principle contractor	Project Arborist	

Arborist to minimize the impact to trees.				
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	

13. BIBLIOGRAPHY/REFERENCES

- Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009).
- Council of Standards Australia, *AS4373 Pruning of amenity trees* (2007).
- Mattheck, C. & Breloer, H., *The body language of trees - A handbook for failure analysis*, The Stationary Office, London, England (1994).
- Barrell Tree Consultancy, *SULE: Its use and status into the New Millennium*, TreeAZ/03/2001, http://www.treeaz.com/.
- Barrell Tree Consultancy, *Tree AZ version 10.10-ANZ*, http://www.treeaz.com/.
- *Pittwater Local Environmental Plan 2014* https://legislation.nsw.gov.au/#/view/EPI/2014/320/historical2017-08-25/full.
- *Pittwater 21 Development Control Plan,* https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/pages/plan/book.aspx?exhibit=PDCP.
- *Northern Beaches Council - Removing and Pruning Trees on Private Land*, https://www.northernbeaches.nsw.gov.au/planning-development/tree-management/private-land
- State Environmental Planning Policy (Vegetation in non-rural areas 2017)
- Threatened Species Conservation Act 1995

14. LIST OF APPENDICES

The following are included in the appendices:

Appendix 1 - Proposed site plan
Appendix 1a – Site Management and Tree Protection Plan
Appendix 1b – Overview of Both Sites and Tree Data
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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MAA
MISA

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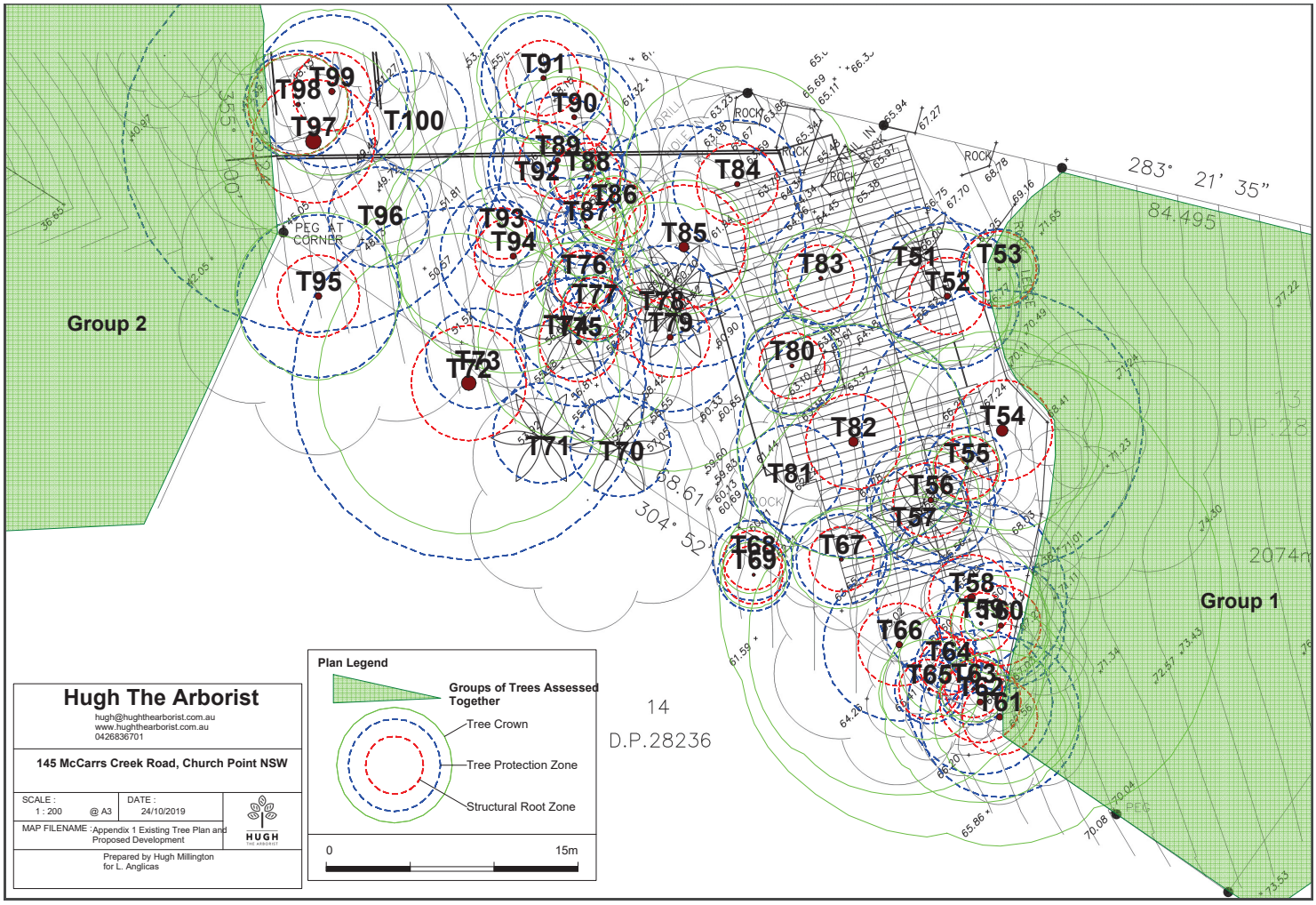

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SCALE :	DATE :
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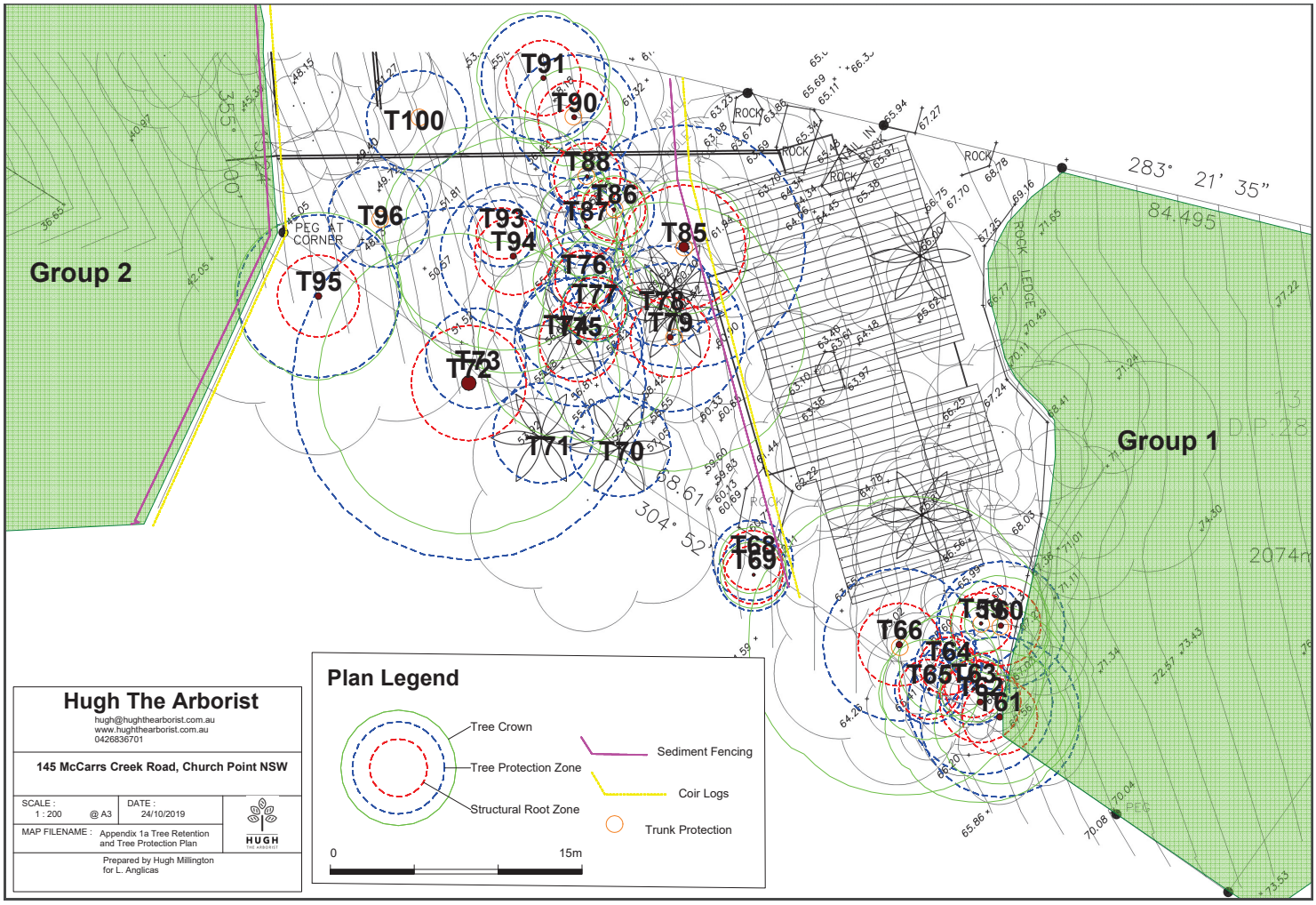
MAP FILENAME : Appendix 1 Existing Tree Plan and Proposed Development

Prepared by Hugh Millington for L. Anglicas



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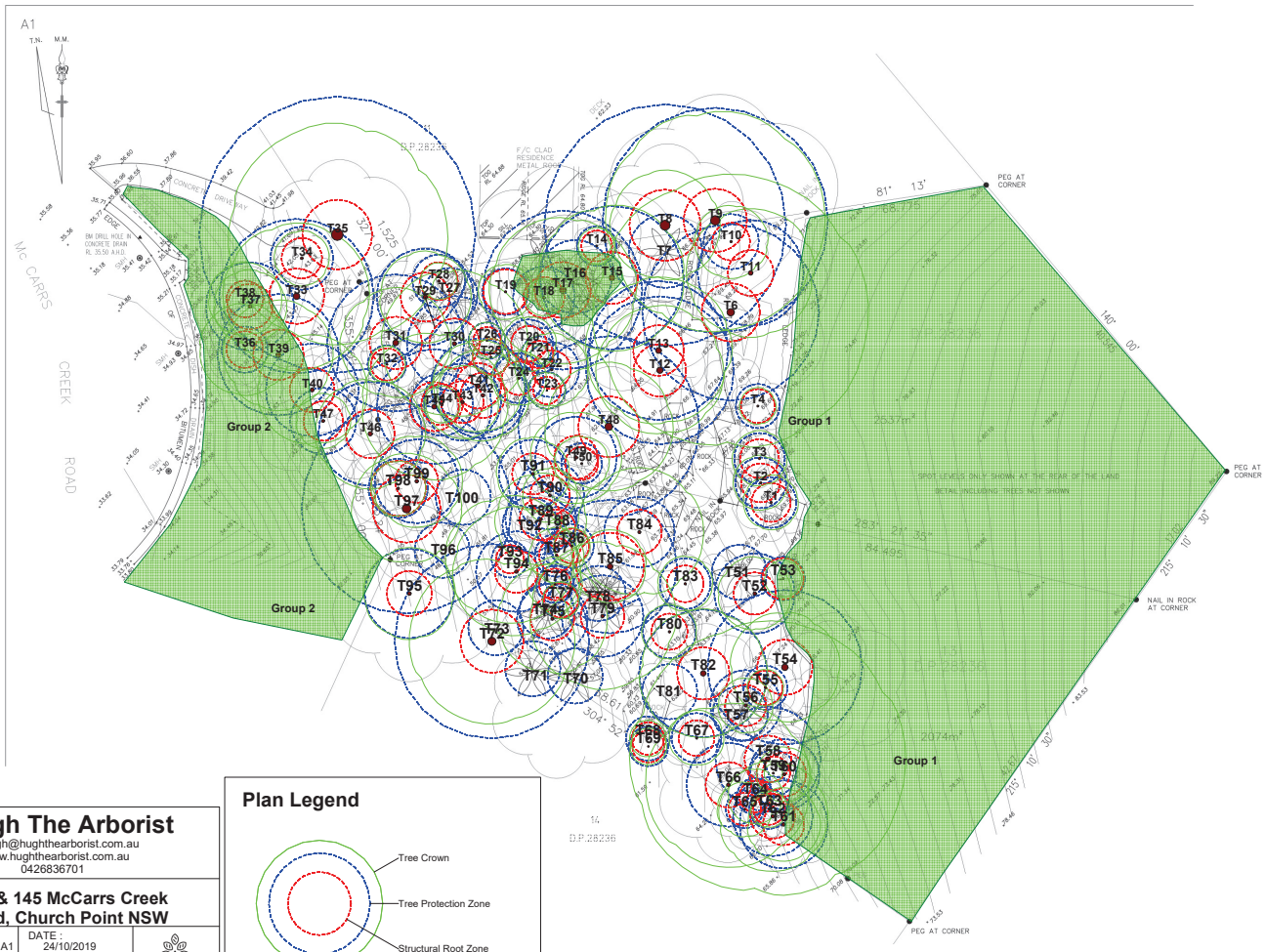
SCALE : 1 : 200 @ A3	DATE : 24/10/2019
MAP FILENAME : Appendix 1a Tree Retention and Tree Protection Plan	

Prepared by Hugh Millington for L. Anglicas



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SCALE : 1 : 200 @ A1
DATE : 24/10/2019
MAP FILENAME : Appendix 1b Tree Survey Data

Prepared by Hugh Millington for L. Anglicas

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	Forest Oak	*Allocasuaruna torulosa*	Mature	8	3	230		230	345	Good	Fair	Medium	2. Medium	A2	2.8	2.1	Epicormic canopies.
2	Forest Oak	*Allocasuaruna torulosa*	Mature	8	3	230		230	345	Good	Fair	Medium	2. Medium	A2	2.8	2.1	Epicormic canopies.
3	Forest Oak	*Allocasuaruna torulosa*	Mature	8	3	230		230	345	Good	Fair	Medium	2. Medium	A2	2.8	2.1	Epicormic canopies.
4	Forest Oak	*Allocasuaruna torulosa*	Mature	6	2	200		200	250	Good	Fair	Medium	2. Medium	A2	2.4	1.8	None.
5	Smooth Barked Apple	*Angophora costata*	0	0	0	0		0	0	0	0	0	0	0	0.0	0.0	Tree 5 has been removed from the assessment, see table of impact in main report.
6	Smooth Barked Apple	*Angophora costata*	Mature	23	15	800		800	900	Fair	Fair	High	3. Short	A2	9.6	3.2	Major failure on western side. Canopy sparse.
7	Cabbage Palm	*Livistona australis*	Mature	9	3	400		400	0	Good	Good	High	1. Long	A1	4.8	0.0	None.
8	Turpentine	*Syncarpia glomulifera*	Mature	15	6	630	400	1094	1450	Good	Fair	Very High	2. Medium	A1	13.1	3.9	Three stems included at base.
9	Grey Gum	*Eucalyptus punctata*	Mature	18	12	1020		1020	1100	Good	Good	Very High	1. Long	A1	12.2	3.4	Phototropic lean to west.
10	Forest Oak	*Allocasuaruna torulosa*	Mature	10	4	250		250	320	Poor	Fair	Medium	3. Short	Z4	3.0	2.1	Fungal bracket on trunk.
11	Red Mahogany	*Eucalyptus resinifera*	Mature	18	7	480		480	510	Good	Fair	High	2. Medium	A2	5.8	2.5	Natural lean to west.
12	Turpentine	*Syncarpia glomulifera*	Mature	10	7	670		670	700	Good	Good	High	1. Long	A1	8.0	2.8	Mechanical soil disturbance.
13	Forest Oak	*Allocasuaruna torulosa*	Mature	10	8	630		630	650	Good	Good	Medium	1. Long	A1	7.6	2.8	None.
14	Blueberry Ash	*Elaeocarpus reticulatus*	Mature	9	2	180		180	200	Fair	Good	Medium	2. Medium	A2	2.2	1.7	None.
15	Red Mahogany	*Eucalyptus resinifera*	Mature	13	8	650		650	700	Good	Good	High	1. Long	A1	7.8	2.8	None.
16	Cabbage Palm	*Livistona australis*	Mature	6	2	300		300	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
17	Turpentine	*Syncarpia glomulifera*	Semi-mature	10	8	720		720	820	Good	Good	High	1. Long	A1	8.6	3.0	None.
18	Forest Oak	*Allocasuaruna torulosa*	Mature	6	2	280		280	390	Fair	Poor	Low	3. Short	Z10	3.4	2.2	Lost apical leader.
19	Coachwood	*Ceratopetalum apetalum*	Mature	5	3	150	150	212	480	Good	Good	High	1. Long	A1	2.5	2.4	None.
20	Forest Oak	*Allocasuaruna torulosa*	Mature	5	3	220		220	280	Fair	Fair	Medium	2. Medium	A2	2.6	1.9	None.
21	Turpentine	*Syncarpia glomulifera*	Mature	5	1	120		120	150	Good	Good	High	1. Long	A1	1.4	1.5	None.
22	Forest Oak	*Syncarpia glomulifera*	Mature	10	4	250		250	340	Good	Good	Medium	1. Long	A1	3.0	2.1	None.
23	Forest Oak	*Allocasuaruna torulosa*	Semi-mature	7	2	120		120	150	Good	Fair	Medium	2. Medium	A2	1.4	1.5	Mechanical damage at base.
24	Forest Oak	*Allocasuaruna torulosa*	Mature	8	3	225		225	245	Good	Good	Medium	1. Long	A1	2.7	1.8	None.
25	Forest Oak	*Allocasuaruna torulosa*	Mature	6	2	110	120	163	300	Fair	Poor	Medium	3. Short	Z10	2.0	2.0	Cavities at base.
26	Forest Oak	*Allocasuaruna torulosa*	Mature	5	2	100		100	150	Fair	Good	Medium	2. Medium	A2	1.2	1.5	None.
27	Cabbage Palm	*Livistona australis*	Mature	4	2	300		300	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
28	Forest Oak	*Allocasuaruna torulosa*	Mature	8	2	240		240	320	Decline	Poor	Low	4. Remove	Z5	2.9	2.1	Severe decline. Fungal brackets in trunk.
29	Turpentine	*Syncarpia glomulifera*	Mature	9	5	440		440	600	Good	Fair	High	2. Medium	A2	5.3	2.7	Lost apical leader.
30	Forest Oak	*Allocasuaruna torulosa*	Mature	18	8	640		640	430	Good	Good	High	1. Long	A1	7.7	2.3	None.
31	Forest Oak	*Allocasuaruna torulosa*	Mature	18	6	620		620	700	Good	Good	High	1. Long	A1	7.4	2.8	None.
32	Turpentine	*Syncarpia glomulifera*	Mature	7	2	175		175	220	Good	Good	High	1. Long	A1	2.1	1.8	None.
33	Turpentine	*Syncarpia glomulifera*	Mature	13	8	700		700	800	Good	Good	High	1. Long	A1	8.4	3.0	Mechanical damage on major root.
34	Forest Oak	*Allocasuaruna torulosa*	Mature	6	3	285		285	380	Poor	Poor	Medium	4. Remove	Z6	3.4	2.2	Basal decay tension side and decayed twin stem.
35	Grey Ironbark	*Eucalyptus paniculata*	Veteran	28	12	1260		1260	1380	Good	Fair	Very High	2. Medium	A4	15.1	3.8	Large and old. Cavity's termites.
36	Grey Gum	*Eucalyptus punctata*	Mature	8	5	210		210	300	Good	Fair	High	2. Medium	A2	2.5	2.0	Canopy bias to the west. Unable to access base to assess. Located on bank.
37	Turpentine	*Syncarpia glomulifera*	Mature	10	4	400		400	500	Good	Fair	High	2. Medium	A2	4.8	2.5	Canopy bias to the west. Unable to access bade to assess. Located on bank.
38	Cheese Tree	*Glochidion ferdinandi*	Semi-mature	7	4	100	110	149	300	Good	Fair	Medium	2. Medium	A2	1.8	2.0	Canopy bias to the west. Unable to access bade to assess. Located on bank.
39	Turpentine	*Syncarpia glomulifera*	Mature	15	6	550		550	640	Good	Good	High	1. Long	A1	6.6	2.7	Soil disturbance at base from access.
40	Turpentine	*Syncarpia glomulifera*	Mature	13	6	420		420	475	Good	Good	High	1. Long	A1	5.0	2.4	Soil disturbance at base from access.
41	Turpentine	*Syncarpia glomulifera*	Mature	15	5	430		430	500	Good	Good	High	1. Long	A1	5.2	2.5	None.
42	Forest Oak	*Allocasuaruna torulosa*	Mature	15	5	390		390	490	Good	Good	High	1. Long	A1	4.7	2.5	None.
43	Turpentine	*Syncarpia glomulifera*	Mature	12	4	350		350	420	Good	Fair	Medium	1. Long	A2	4.2	2.3	Root disturbance from access to site.
44	Forest Oak	*Allocasuaruna torulosa*	Mature	10	2	200	200	283	395	Fair	Fair	Medium	3. Short	Z10	3.4	2.2	Basal disturbance from access to site.
45	Turpentine	*Syncarpia glomulifera*	Mature	16	8	520		520	600	Good	Fair	High	1. Long	A2	6.2	2.7	Basal disturbance from access to site.

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
46	Forest Oak	*Allocasuaruna torulosa*	Mature	12	6	470		470	590	Fair	Poor	Medium	3. Short	Z10	5.6	2.7	Basal disturbance from access to site. Structural root severance 50mm.
47	Red Mahogany	*Eucalyptus resinifera*	Mature	10	3	300		300	360	Fair	Poor	Medium	2. Medium	A2	3.6	2.2	Basal disturbance from access to site. Raised soil around base.
48	Forest Oak	*Allocasuaruna torulosa*	Mature	12	7	820		820	1000	Good	Good	High	1. Long	A1	9.8	3.3	None.
49	Forest Oak	*Allocasuaruna torulosa*	Mature	10	5	370		370	450	Good	Fair	Medium	2. Medium	A2	4.4	2.4	Unable to assess base due to acess.
50	Turpentine	*Syncarpia glomulifera*	Mature	5	3	185		185	235	Good	Fair	Medium	2. Medium	Z10	2.2	1.8	Heavily suppressed canopy.
51	Cabbage Palm	*Livistona australis*	Mature	5	2	230		230	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
52	Forest Oak	*Allocasuaruna torulosa*	Mature	12	4	365		365	420	Good	Good	Medium	1. Long	A1	4.4	2.3	None.
53	Forest Oak	*Allocasuaruna torulosa*	Mature	5	2	150	130	198	400	Fair	Poor	Medium	4. Remove	Z6	2.4	2.3	Growing on rock shelf, had part failed from wind throw.
54	Forest Oak	*Allocasuaruna torulosa*	Mature	12	6	700		700	800	Fair	Poor	Medium	3. Short	Z10	8.4	3.0	Extensive internal decay. Open longitudinal cavities throughout and extensive brown rot.
55	Forest Oak	*Allocasuaruna torulosa*	Mature	10	2	200		200	260	Good	Good	High	1. Long	A1	2.4	1.9	None.
56	Turpentine	*Syncarpia glomulifera*	Mature	10	3	320		320	400	Good	Good	High	1. Long	A1	3.8	2.3	None.
57	Cabbage Palm	*Livistona australis*	Mature	4	2	400		400	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
58	Red Mahogany	*Eucalyptus scias*	Mature	20	15	475		475	540	Good	Fair	Very High	2. Medium	AA1	5.7	2.6	Unusual tree. Cavity's on trunk. Habitat. Termite nest.
59	Turpentine	*Syncarpia glomulifera*	Mature	9	1	210		210	245	Good	Good	High	1. Long	A1	2.5	1.8	None.
60	Forest Oak	*Allocasuaruna torulosa*	Mature	13	3	320		320	460	Fair	Poor	Medium	3. Short	Z10	3.8	2.4	Failed apical leader.
61	Turpentine	*Syncarpia glomulifera*	Mature	10	4	345	200	399	800	Good	Good	High	1. Long	A1	4.8	3.0	None.
62	Forest Oak	*Allocasuaruna torulosa*	Mature	14	6	360		360	480	Good	Good	High	1. Long	A1	4.3	2.4	None.
63	Turpentine	*Syncarpia glomulifera*	Mature	6	2	180		180	210	Good	Good	High	1. Long	A2	2.2	1.7	Suppressed canopy.
64	Turpentine	*Syncarpia glomulifera*	Semi-mature	5	3	150		150	210	Good	Good	High	1. Long	A1	1.8	1.7	None.
65	Forest Oak	*Allocasuaruna torulosa*	Semi-mature	6	3	170		170	230	Good	Fair	Medium	2. Medium	A2	2.0	1.8	Suppressed canopy.
66	Forest Oak	*Allocasuaruna torulosa*	Mature	17	9	380		380	500	Good	Good	High	1. Long	A1	4.6	2.5	None.
67	Forest Oak	*Allocasuaruna torulosa*	Mature	10	3	225		225	280	Good	Good	High	1. Long	A1	2.7	1.9	None.
68	Forest Oak	*Allocasuaruna torulosa*	Mature	8	2	200		200	255	Good	Good	Medium	1. Long	A1	2.4	1.9	None.
69	Forest Oak	*Allocasuaruna torulosa*	Mature	8	2	180		180	220	Fair	Fair	Medium	3. Short	A2	2.2	1.8	Neighboring failed tree has damaged subject
70	Cabbage Palm	*Livistona australis*	Mature	9	2	360		360	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
71	Cabbage Palm	*Livistona australis*	Mature	7	2	280		280	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
72	Forest Oak	*Allocasuaruna torulosa*	Mature	20	9	880		880	1100	Good	Poor	High	3. Short	Z10	10.6	3.4	Extensive basal decay. Open cavities, high habitat value.
73	Cabbage Palm	*Livistona australis*	Mature	4	2	400		400	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
74	Cabbage Palm	*Livistona australis*	Mature	5	2	400		400	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
75	Smooth Barked Apple	*Angophora costata*	Mature	12	6	320		320	450	Good	Fair	Medium	3. Short	Z10	3.8	2.4	Lost apical leader. Canker growth in main union.
76	Turpentine	*Syncarpia glomulifera*	Semi-mature	6	3	170		170	210	Good	Good	High	1. Long	A1	2.0	1.7	None.
77	Forest Oak	*Allocasuaruna torulosa*	Semi-mature	6	2	155		155	255	Good	Good	Medium	1. Long	A1	1.9	1.9	None.
78	Cabbage Palm	*Livistona australis*	Mature	5	2	310		310	0	Good	Good	High	1. Long	A1	3.0	0.0	Group of three trees.
79	Forest Oak	*Allocasuaruna torulosa*	Mature	16	8	370		370	455	Good	Good	High	1. Long	A1	4.5	2.4	None.
80	Forest Oak	*Allocasuaruna torulosa*	Mature	10	3	240		240	290	Good	Good	Medium	1. Long	A1	2.9	2.0	None.
81	Cabbage Palm	*Livistona australis*	Mature	9	2	320		320	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
82	Forest Oak	*Allocasuaruna torulosa*	Mature	16	7	580		580	700	Good	Fair	High	2. Medium	A2	7.0	2.8	Cavity on trunk.
83	Forest Oak	*Allocasuaruna torulosa*	Mature	9	3	230		230	300	Good	Good	Medium	1. Long	A1	2.8	2.0	None.
84	Turpentine	*Syncarpia glomulifera*	Mature	10	7	320		320	480	Good	Good	High	1. Long	A1	3.8	2.4	None.
85	Turpentine	*Syncarpia glomulifera*	Mature	10	4	475	375	605	1300	Good	Good	High	1. Long	A1	7.3	3.7	None.
86	Forest Oak	*Allocasuaruna torulosa*	Mature	9	2	200		200	260	Fair	Fair	Medium	3. Short	Z4	2.4	1.9	Fungal brackets present, likely parasite.
87	Forest Oak	*Allocasuaruna torulosa*	Mature	9	3	195		195	260	Good	Good	Medium	1. Long	A1	2.3	1.9	None.
88	Forest Oak	*Allocasuaruna torulosa*	Mature	11	1	190		190	300	Good	Good	Medium	1. Long	A2	2.3	2.0	None.
89	Forest Oak	*Allocasuaruna torulosa*	Mature	9	5	320		320	420	Fair	Poor	Medium	3. Short	Z10	3.8	2.3	Included union failed from canopy.

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
90	Turpentine	*Syncarpia glomulifera*	Mature	12	3	310		310	365	Good	Good	High	1. Long	A1	3.7	2.2	None.
91	Forest Oak	*Allocasuaruna torulosa*	Mature	10	4	310		310	400	Good	Good	High	1. Long	A1	3.7	2.3	None.
92	Cabbage Palm	*Livistona australis*	Mature	5	2	245		245	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
93	Turpentine	*Syncarpia glomulifera*	Semi-mature	7	2	130		130	160	Good	Good	High	1. Long	A1	1.6	1.5	None.
94	Forest Oak	*Allocasuaruna torulosa*	Mature	14	7	365		365	430	Good	Good	High	1. Long	A1	4.4	2.3	None.
95	Forest Oak	*Allocasuaruna torulosa*	Mature	14	5	405		405	490	Good	Good	Medium	1. Long	A1	4.9	2.5	None.
96	Cabbage Palm	*Livistona australis*	Mature	8	2	325		325	0	Good	Good	High	1. Long	A1	3.0	0.0	None.
97	Turpentine	*Syncarpia glomulifera*	Mature	17	6	950		950	1300	Good	Poor	High	2. Medium	Z10	11.4	3.7	Extensive basal decay. Main union included bark.
98	Turpentine	*Syncarpia glomulifera*	Mature	9	3	230	140	269	800	Fair	Poor	Low	3. Short	Z10	3.2	3.0	Mature epicormic growth from old dead tree
99	Turpentine	*Syncarpia glomulifera*	Mature	10	5	380		380	440	Good	Fair	High	2. Medium	A2	4.6	2.3	Old co dominant leader dead.
100	Cabbage Palm	*Livistona australis*	Mature	7	2	320		320	0	Good	Good	High	1. Long	A1	3.0	0.0	None.

Explanatory Notes

Grey shading indicates trees located on site 143 McCarrs Creek Road

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) indicates the stem number and the (t) indicates the total DBH when calculated in accordance with AS4970-2009 definition.

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

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

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

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

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

Health - Good/Fair/Poor/Dead

Structure - Good/Fair/Poor

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

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

(x) Indicates the measurement taken for the diameter at tree base above the buttress roots.

(E) Indicates estimated measurements.

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

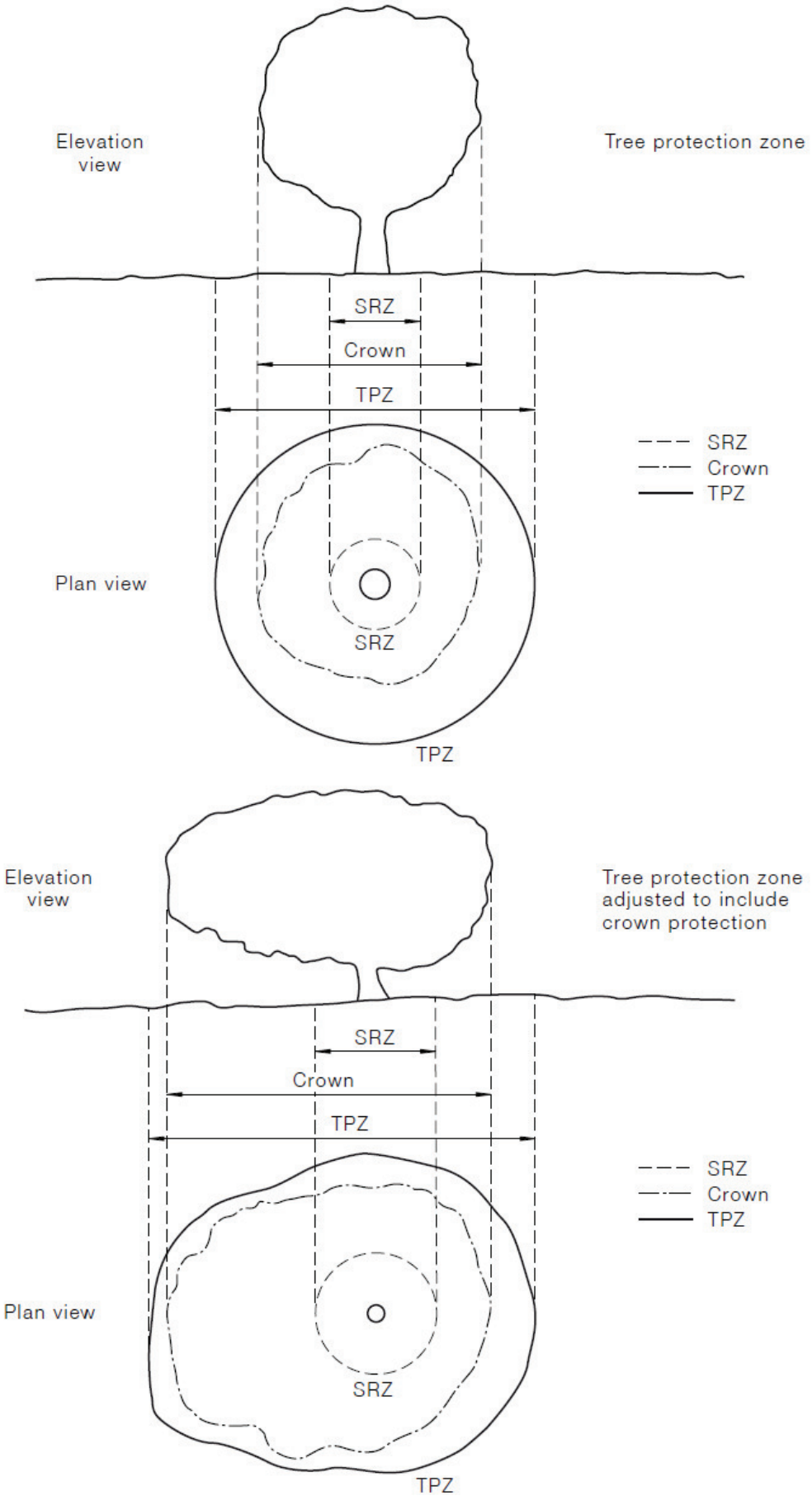
Radius is measured from the centre of the stem at ground level.
A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required).

Minor encroachment into the TPZ

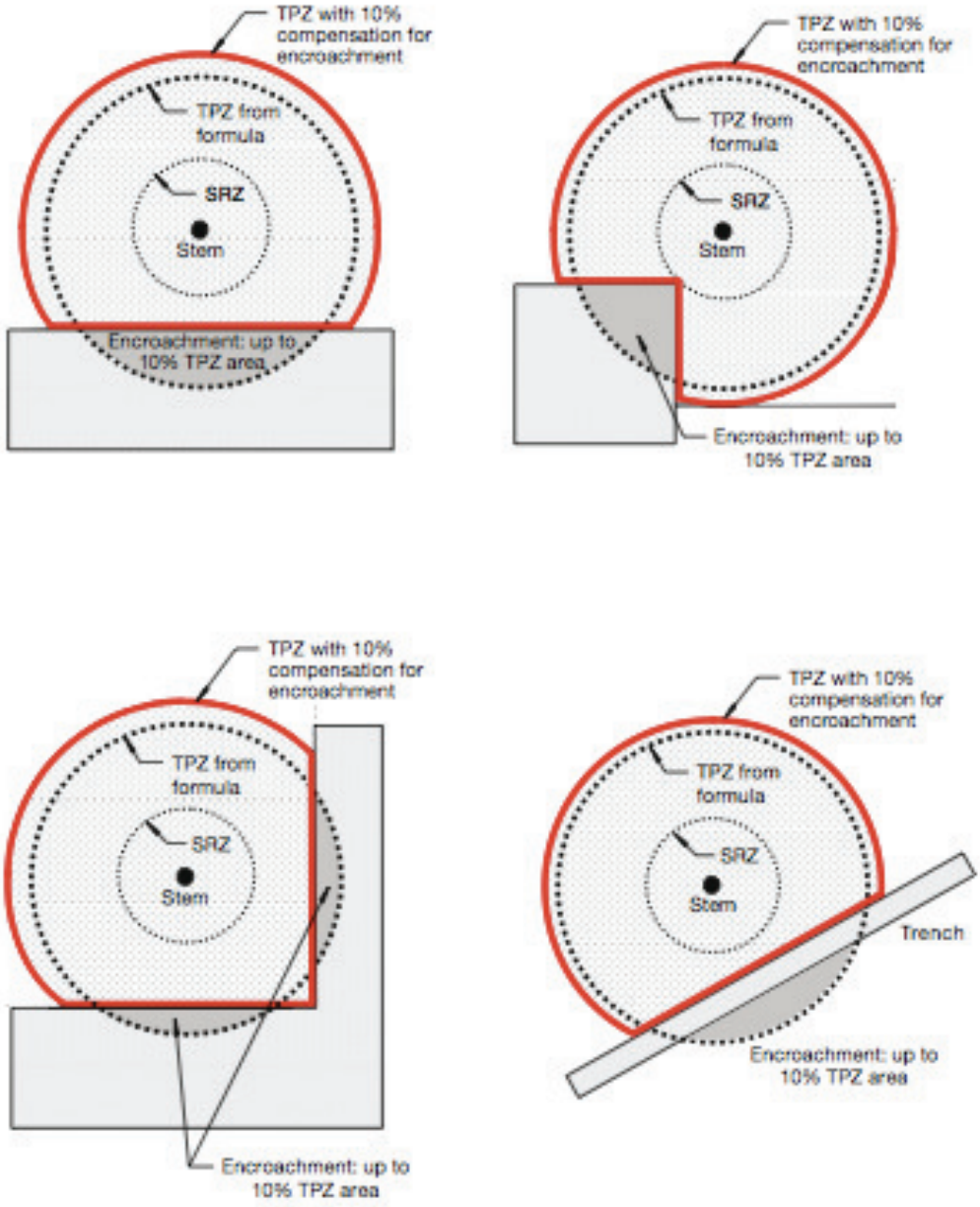
Where encroachment into the TPZ is unavoidable it is generally accepted that encroachment of under 10% of the total TPZ is possible without carrying out detailed root investigations. This minor loss of root area is normally compensated by the roots developing elsewhere.

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.