



Arboricultural Impact Assessment

Client Name: Gail Hilton
Site Address: 3 Coolawin Road, Avalon NSW
Authors Details: Hugh Millington
Email: hugh@hughtheArborist.com.au
Phone: 0426836701
Date Prepared: 16th May 2025

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1. INTRODUCTION

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

Table 1: Documents Reviewed For The Assessment

Title	Author	Date	Reference on document
Survey Plan	C&A Surveyors	14/06/2022	21959-22DET/ID
Architectural Plans	Action Plans	12/02/2025	Revision A

NO.	DRAWING NAME
DA00	COVER
DA01	NOTATION
DA02	SAFETY NOTES
DA03	SITE ANALYSIS
DA04	SITE / ROOF / SEDIMENT EROSION / WASTE MANAGEMENT / STORMWATER CONCEPT PLAN
DA05	EXISTING GROUND FLOOR PLAN
DA06	EXISTING FIRST FLOOR PLAN
DA07	PROPOSED GROUND FLOOR PLAN
DA08	PROPOSED FIRST FLOOR PLAN
DA09	NORTH / EAST ELEVATION
DA10	SOUTH / WEST ELEVATION
DA11	LONG / CROSS SECTION
DA12	AREA CALCULATIONS
DA13	WINTER SOLSTICE 9 AM
DA14	WINTER SOLSTICE 12 PM
DA15	WINTER SOLSTICE 3 PM
DA16	SAMPLE BOARD
DA17	BASIX COMMITMENTS

- 1.2 The site and tree inspections were carried out on 8th May 2025. Access was available to the subject site and adjoining public areas only. All tree data was collected during this time.

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 trees located on and adjoining the site within five metres of the proposed works.
 - 2.1.2 For the purpose of this report, a tree is taken to have a height equal to or greater than 5 metres.
 - 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 Recommend methods to mitigate development impacts where possible.
 - 2.1.6 Recommend tree protection measures for any tree to be retained in accordance with AS4970 Protection of trees on development sites (2009).

3. LIMITATIONS

- 3.1 The 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 of the inspection.
- 3.2 All observations were carried out from ground level. No additional detailed testing was carried out on trees or soil on site and none of the surrounding surfaces were lifted for investigated.
- 3.3 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.
- 3.4 The report reflects the subject tree(s) as found on the day of the inspection. Any changes to the growing environment of the subject trees, 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.
- 3.5 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.

- 3.6 All diagrams, plans and photographs included in this report are visual aids only, and are not to scale unless otherwise indicated.
- 3.7 Hugh The Arborist neither guarantees, nor is responsible for, the accuracy of information provided by others that is contained within this report.
- 3.8 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 the trees at the site.
- 3.9 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.
- 3.10 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.
- 3.11 Alteration of this report invalidates the entire report.

4. METHODOLOGY

- 4.1 The following information was collected during the assessment of the subject tree(s).
 - 4.1.1 Tree common name
 - 4.1.2 Tree botanical name
 - 4.1.3 Tree age class
 - 4.1.4 DBH (Trunk/Stem diameter at breast height/1.4m) - millimetres.
 - 4.1.5 DAB (Trunk diameter directly above the root buttress) – millimetres.
 - 4.1.6 Estimated height - metres
 - 4.1.7 Estimated crown spread (radius of crown) - metres
 - 4.1.8 Health
 - 4.1.9 Structural condition
 - 4.1.10 Amenity value
 - 4.1.11 Estimated remaining contribution years (SULE)¹
 - 4.1.12 Retention value (Tree AZ)²
 - 4.1.13 Notes/comments

¹ Barrell, J. (2001), 'SULE: Its use and status in the new millennium' in *Management of Mature Trees proceedings of the 4th NAAA Workshop*, Sydney, 2001. Barrell.

² Barrell Tree Consultancy, *Tree AZ version 10.10-ANZ*, <http://www.treeaz.com/>.

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- 4.2 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer, 1994).³
- 4.3 Trunk diameter was measured using a DBH tape or in some cases estimated. The trunk diameter of all trees in adjoining sites has been estimated. Tree height and tree canopy spread was measured with a clinometer or in some cases estimated. All other measurements were estimations unless otherwise stated. The other tool used during the assessment was a digital camera.
- 4.4 All information was imported into (GIS) PT-mapper pro software. This software was used to measure/calculate all encroachment estimates included in this report.
- 4.5 All DBH measurements, tree protection zones, and structural root zones were calculated in accordance with methods set out in AS4970 Protection of trees on development sites (2009) in a Microsoft Excel spreadsheet.⁴
- 4.6 Details of how the observations in this report have been assessed are listed in the appendices.

5. SITE LOCATION AND BRIEF DESCRIPTION OF PROPOSAL

- 5.1 The site is located in the suburb of Avalon within the Northern Beaches Local Government Area (LGA), this assessment has been carried out in accordance with the following legislation and policy.
 - 5.1.1 Pittwater Local Environmental Plan (LEP) 2014
 - 5.1.2 Pittwater 21 Development Control Plan (DCP) 2014
 - 5.1.3 State Environmental Planning Policy (Biodiversity and Conservation) 2021
- 5.1 The proposed works assessed in this report consist of alterations and additions including a new deck, alfresco area and swimming pool.
- 5.2 The site has not been identified as within a heritage conservation area but is within a area with mapped biodiversity according to the NSW Planning Portal Spatial Viewer.⁵ Accessed 12/05/2025. The significance of mapped biodiversity is outside the scope of this assessment.
- 5.3 The site is a battleaxe lot containing multiple significant trees.

³ Mattheck, C. & Breloer, H., *The body language of trees - A handbook for failure analysis*, The Stationary Office, London, England (1994).

⁴ Council Of Standards Australia, *AS4970 Protection of trees on development sites* (2009).

⁵ <https://www.planningportal.nsw.gov.au/spatialviewerhistoric/#/find-a-property/address>

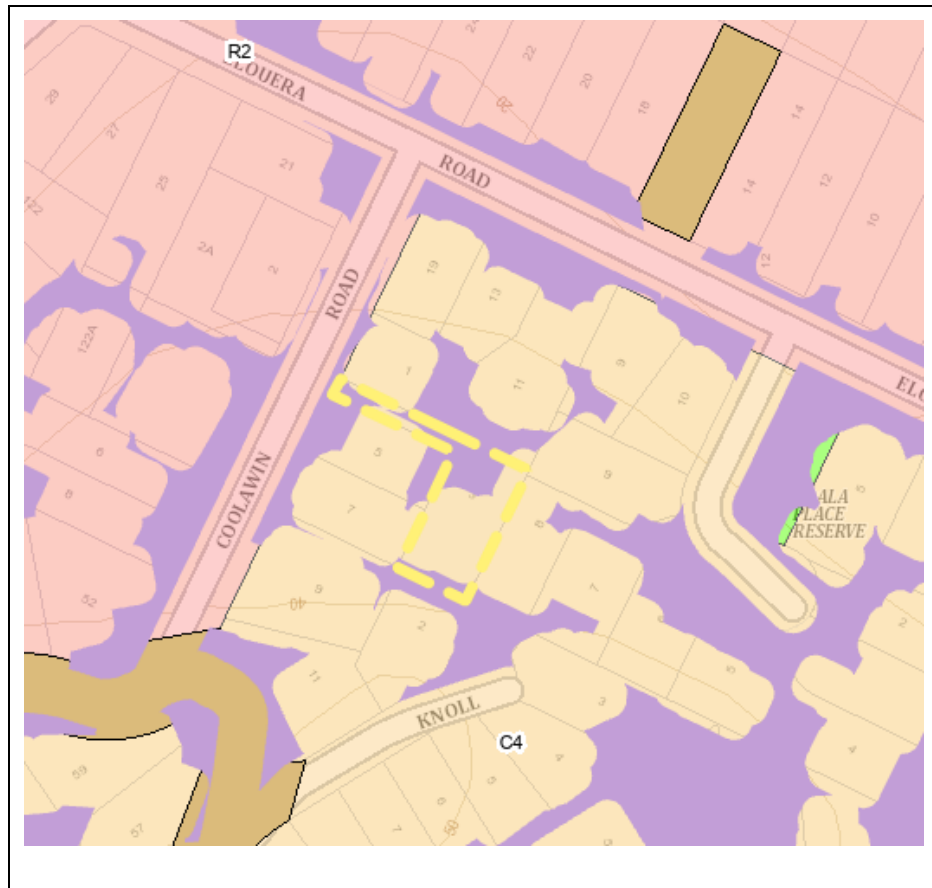
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Site Location ⁶



⁶ <https://www.planningportal.nsw.gov.au/spatialviewerhistoric/#/find-a-property/address>

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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 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:** In appendix 1 the tree information including canopy spread, TPZ and SRZ have been overlaid onto the received site plan.
- Appendix 1: Existing Site Plan
 - Appendix 1A: Proposed Site Plan and tree Protection Plan
- 6.3 **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.
- 6.4 **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.

- 6.5 **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.
- 6.6 **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. ASSESSMENT OF CONSTRUCTION IMPACTS

7.1 **Table 2:** In the table below, the impact of the proposed development has been assessed for all trees included in the report.

7.2 The following abbreviations have been used in this report. Tree Protection Zone (TPZ). Structural Root Zone (SRZ).

Tree ID	Botanical Name	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	<i>Eucalyptus paniculata</i>	A1	7.8	2.9	Major	A proposed low retaining wall encroaches into the TPZ and the SRZ by up to 22% which is a major encroachment. The proposed section plans indicate the purpose of the wall is to create a more level grass area for the landscaping. The proposed swimming pool works represent a minor encroachment as a standalone component, are included within the 22% and are located on the fringe of the TPZ only indicating the pool will be of negligible impact to the tree. The proposed retaining wall can be managed at an acceptable level of impact and the tree retained in a viable condition if the wall was constructed via tree sensitive methods and the fill material minimised. Refer to section 8.2 for specifications.	Tree sensitive construction
2	<i>Corymbia maculata</i>	A1	9.2	3.1	Major	The existing deck and dwelling occupies up to 32% of the TPZ and the SRZ area. The proposed deck occupies close to the same area and maintains the same setback from the trunk of the tree. The section plans provided show the deck to be installed as a raised structure with modifications to the western side to incorporate new stairs. On the provision the proposed deck can be installed via tree sensitive construction the tree will not be significantly impacted by the replacement of the deck. The proposed swimming pool is a new encroachment to the west of the tree and encroaches into the TPZ with no encroachment into the SRZ. The section plans provided show masonry walls to retain fill for the proposed pool to be installed to incorporate the fall of the natural ground. The wall footings are assumed to be continuous strip footings and will require root severance in the event roots are encountered. The loss of up to 15% of TPZ area is a major encroachment, however, may be offset with remediation within the remaining TPZ area and area contiguous to the current TPZ area to compensate for any loss. In summary, the	Tree sensitive construction

Tree ID	Botanical Name	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
						replacement of the existing deck does not represent an encroachment that will affect the viability of the tree providing it is constructed in the same way (raised on piers) as the existing deck. The proposed swimming pool will result in the loss of 15% TPZ area which is a major encroachment but is not considered likely to significantly affect the viability of the given the trees healthy condition and any effects from the works could be offset with remediation. Refer to section 8.2 and the recommendations section for specifications.	
3	<i>Archontophoenix cunninghamiana</i>	Z3	2.0	NA	Major	Tree located on adjoining land. The modifications to the existing deck will encroach into the TPZ by up to 13%. While this is a major encroachment it is not considered likely to affect the viability of a Palm tree and the existing stairs/level changes are likely to have affected the distribution of the tree roots which further reduces the level of impact.	Retain and protect
4	<i>Melaleuca quinquenervia</i>	A1	4.9	2.4	Minor	Tree located on adjoining land and has not been identified on the survey plan. Less than 10% encroachment into the TPZ and none in the SRZ from the proposed alfresco area. This is a minor encroachment that will not affect the viability of the tree.	Retain and protect
5	<i>Glochidion ferdinandi</i>	A1	2.6	1.8	None	Tree located on adjoining land. No encroachment proposed.	Retain and protect
6	<i>Eucalyptus grandis</i>	A2	5.9	2.6	None	Tree located on adjoining land. No encroachment proposed.	Retain and protect
7	<i>Eucalyptus punctata</i>	A2	2.0	2.8	None	Tree located on adjoining land. No encroachment proposed.	Retain and protect
8	<i>Corymbia maculata</i>	A2	5.3	2.5	None	No encroachment proposed.	Retain and protect
9	<i>Melaleuca Bracteata</i>	Z2	2.0	1.5	Major	The proposed works are located within the TPZ and the SRZ of the tree and consist of the replacement of the existing ramp like for like. The proposed works will not significantly affect the viability of the tree providing the pier	Tree sensitive construction

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Tree ID	Botanical Name	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
						footings are installed via tree sensitive construction methods. Refer to section 8.2.	
10	<i>Corymbia maculata</i>	A1	5.5	2.6	Minor	Less than 10% encroachment into the TPZ and none in the SRZ from the proposed replacement of the timber ramp. This is a minor encroachment that will not affect the viability of the tree.	Retain and protect
11	<i>Corymbia maculata</i>	A1	2.8	2.0	None	Tree located on adjoining land. No encroachment proposed.	Retain and protect
12	<i>Eucalyptus punctata</i>	A1	3.2	2.0	None	Tree located on adjoining land. No encroachment proposed.	Retain and protect
13	<i>Melaleuca quinquenervia</i>	A1	2.2	1.7	None	No encroachment proposed.	Retain and protect
14	<i>Livistona australis</i>	Z1	2.5	NA	None	No encroachment proposed.	Retain and protect
15	<i>Melaleuca Bracteata</i>	A1	4.5	2.2	None	No encroachment proposed.	Retain and protect
16	<i>Corymbia maculata</i>	A1	7.7	2.9	Major	The proposed low retaining wall will encroach into the TPZ but not the SRZ by up to 13%. While this is a major encroachment it is only just above the threshold for minor encroachment. The wall is proposed as a landscaping feature and the associated impact will be further reduced as the wall has been recommended to be installed via tree sensitive construction for Tree 1.	Retain and protect

8. CONCLUSIONS

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

Impact	Reason	Category A	Category Z	Total
		A	Z	
Trees to be removed	Building/landscape construction, new surfacing and/or proximity, or trees in poor condition.	-	-	0
Retained trees subject to TPZ encroachment or no encroachment	Removal of existing surfacing/structures and/or installation of new surfacing/structures will not significantly impact the tree	4,5,6,7,8, 10,11,12,13, 15,16	3,14	13
Trees requiring tree sensitive construction to mitigate development impacts	Proposed impacts may result in the severance of roots leading to the decline or destabilization of trees assessed	1,2	9	3

8.2 **Construction Design/Specification Requirements:** The proposed works have the potential to affect the viability of several trees on and adjoining the site. To ensure the trees are not adversely impacted by the construction, it must be demonstrated the following design and construction specifications can be implemented within the TPZ of the tree. If the construction cannot be completed in accordance with these specifications, the tree may not be viable for retention.

8.2.1 **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.

8.2.2 Landscaping and low retaining wall: 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 than 200mm without assessment by a consulting Arborist.
- 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, consider 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 40mm in diameter.

8.2.3 Tree Sensitive Pier Footings (All decking within TPZ areas): To minimise root loss in the TPZ of the trees, the footings of the proposed post/pier must be located to avoid significant tree roots in the TPZ and SRZ. To ensure that significant tree roots are retained, it must be demonstrated that the following construction methods can be implemented;

- All horizontal boards/joists and bearers are to be installed on or above the existing natural ground level.
- Excavations in the TPZ should be for pier footings only. All excavations for piers must be carried out manually under the supervision of the project Arborist (see section 11 for details of manual excavation and project Arborist).
- The location of piers must be flexible to avoid significant roots (roots greater than 40mm in diameter). If practical, it is recommended that piers are located to avoid the SRZ of the trees.

- All roots greater than 40mm in diameter must be retained unless the project arborist has assessed and approved in writing that the root(s) are not critical to the health or stability of the tree.

8.2.4 **Underground Services:** AS4970 Protection of trees on development sites (2009) recommends that all underground services located inside the TPZ of any tree to be retained should be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention.

If directional drilling is proposed, section 4.5.5 of AS4970-2009 says that 'The directional drilling bore should be at least 600 mm deep. The project Arborist should assess the likely impacts of boring and bore pits on retained trees'.⁷

If manual excavations are proposed, all excavations for the services should be carried out manually under the supervision of the project Arborist (minimum qualification AQF 5). Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. All roots greater than 40mm in diameter should be retained in the service trench. The service pipe should then be threaded below the retained roots where practical. Roots greater than 40mm within the alignment of the service pipe should only be severed/pruned under the approval of the project Arborist. All root pruning should be in accordance with AS4373 Pruning of amenity trees (2007).

Open trenching in the SRZ of trees can be impractical without impacting significant roots, as often dense root growth is present in the SRZ. Open trenching should therefore be avoided in the SRZ. It is recommended that any section of pipe that is located in the SRZ of trees to be retained is installed via sub-surface boring/directional drilling methods only. The feasibility of sub-surface boring/directional drilling will need to be investigated by a sub-surface boring/directional drilling specialist. The project Arborist should provide advice and supervise excavations for bore pits, which must be carried out manually if located within the TPZ. The top of the pipe must be at least 600mm below the existing soil grade. The location of bore pits should be flexible in the TPZ to avoid significant roots, the project Arborist should assess and advise in writing the impact of any significant root severance to the condition of the tree.

⁷ Council Of Standards Australia, *AS 4970 Protection of trees on development sites* (2009) page 18.

9. RECOMMENDATIONS

- 9.1 This report assesses the impact of a proposed development at the subject site to sixteen trees located on and adjoining the site in accordance with AS4970 Protection of Trees on Development Sites (2009).
- 9.2 **Refer to section 8 for individual tree retentions, removals and tree sensitive recommendations.**
- 9.3 No trees are proposed to be removed as part of the development.
- 9.4 Thirteen trees consisting of two category Z trees and eleven category A trees can be retained under acceptable levels of impacts under the existing proposal.
- 9.5 Three trees consisting of one category Z tree and two category A trees will require tree sensitive construction methods to be implemented to assist with minimising development impacts. Construction methods have been recommended in section 8.2 of this report.
- 9.6 In addition to tree sensitive construction, remediation is recommended for Tree 2 to assist with offsetting the loss of up to 15% TPZ. Mulch and timed irrigation is recommended to be set up within the Tree Protection Zone area to assist with maintaining tree health and encourage the development of new tree roots.
- 9.7 Due to the extent of overlapping TPZ areas, the entire front setback of the site is required to be treated as a Tree Protection Area. Ground protection for site storage and the movement of equipment will require consideration at the Construction Management Plan stage to ensure the trees can be adequately protected while maintaining efficiency for the development to progress.
- 9.8 No services or landscape plan has been assessed as part of this report. See section 8 for general guidance when landscaping within the TPZ of trees to be retained.
- 9.9 This report does not provide approval for tree removal or pruning works. All recommendations in this report are subject to approval by the relevant authorities and/or tree owners. This report should be submitted as supporting evidence with any tree removal/pruning or development application.

10. ARBORICULTURAL WORK METHOD STATEMENT (AMS) AND TREE PROTECTION REQUIREMENTS

- 10.1 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 with a copy of this report.
- 10.2 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.
- 10.3 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).
- 10.4 Initial site meeting/on-going regular inspections:** The project Arborist is to hold a pre-construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to tree protection that may arise. In accordance with AS4970-2009, the project Arborist should carryout regular site inspections to ensure works are carried out in accordance with this document throughout the development process. I recommend regular site inspections on a frequency based on the longevity of the project, this is to be agreed in the initial meeting.
- 10.5 Tree protection Specifications:** It is the responsibility of the principal contractor to install tree protection prior to works commencing at the site (prior to demolition works) and to ensure that the tree protection remains in adequate condition for the duration of the development. The tree protection must not be moved without prior agreement of the project Arborist. The project Arborist must inspect that the tree protection has been installed in accordance with this document and AS4970-2009 prior to works commencing.

10.6 Site Specific Tree Protection Recommendations:

Table 4: Protection Requirements: See appendix 1A for indicative fencing location. See section 10 for general specifications of tree protection.

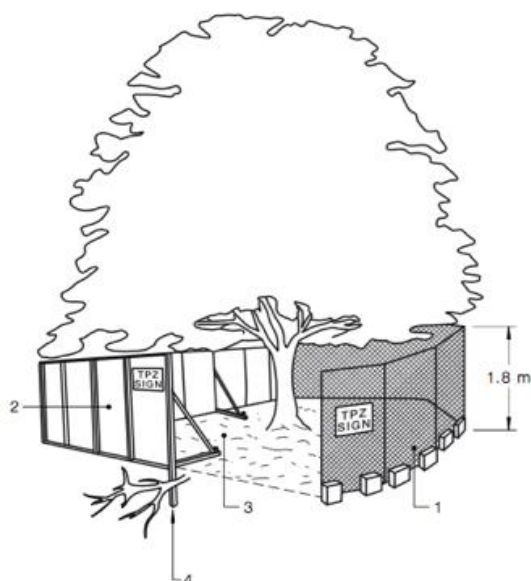
Tree Number	Protection Specification
1	- Fencing to isolate the SRZ area and ground protection elsewhere in the TPZ. -
2	- Fencing to isolate the SRZ area and ground protection elsewhere in the TPZ. -
3,4,5,6,7	- Site boundary fencing will isolate the trees from the works.
8	- Not required, tree is isolated from the works.
9,10,11,12,13, 14,15	- Fencing at the edge of the garden bed.
16	- Trunk protection and ground protection outside of the existing driveway.

10.7 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.

10.8 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

- 10.9 **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.
- 10.10 **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.
- 10.11 **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.

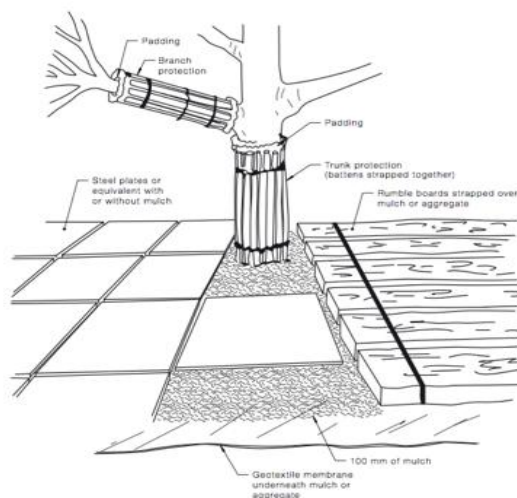


LEGEND:

- 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 AS4970-2009,⁸ with example tree protection.

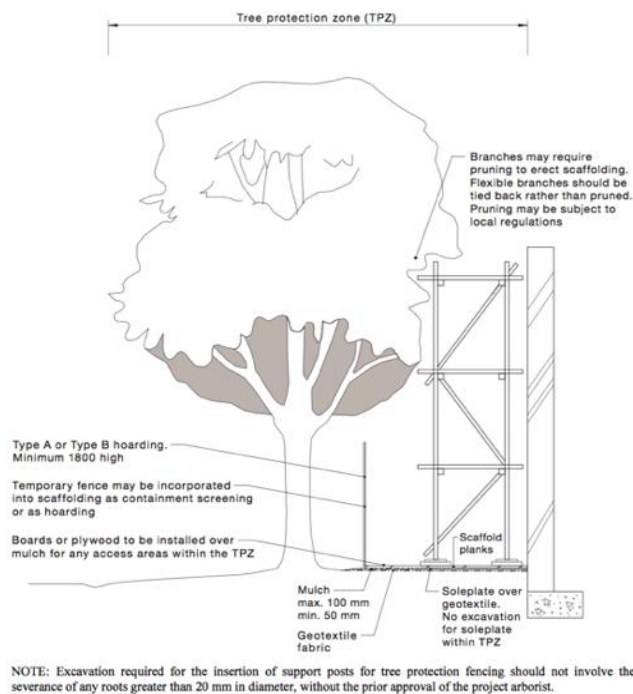
⁸ Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 16.
Report on trees at: 3 Coolawin Road Avalon NSW
Prepared for: Gail Hilton
Prepared by: Hugh Millington, hugh@hughtheArborist.com.au
Date prepared: 16th May 2025



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 AS4970-2009,⁹ with example tree protection.



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20 mm in diameter, without the prior approval of the project arborist.

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

⁹ Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 17.

¹⁰ Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 19.

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- 10.12 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 40 millimetres in diameter and produce a report discussing the significance of the findings. No roots 40 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.
- 10.13 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.
- 10.14 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.

- 10.15 **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 40mm 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).¹¹ The tree root is to be pruned back to a branch root if possible. Make a clean cut and leave as small a wound as possible.
- 10.16 **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.
- 10.17 **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.
- 10.18 **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.
- 10.19 **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.
- 10.20 **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 Council Of Standards Australia, AS 4373 *Pruning of amenity trees* (2007) page 18

- 10.21 **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.
- 10.22 **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.
- 10.23 **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.

11. HOLD POINTS

- 11.1 **Hold Points:** Below is a sequence of hold points requiring project Arborist certification throughout the development process. The hold points 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.

Hold Point	Stage	Responsibility	Certification	Complete Y/N and date
Project Arborist to hold pre construction site meeting with principal contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to feasibility of tree protection requirements that may arise.	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 carry out 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 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	Construction	Principle contractor	Project Arborist	

Hold Point	Stage	Responsibility	Certification	Complete Y/N and date
tree to be retained have been installed in accordance with AS4970-2009.				
All landscaping works/boundary walls 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	

12. BIBLIOGRAPHY/REFERENCES

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- Pittwater Local Environmental Plan (LEP) 2014
- Pittwater 21 Development Control Plan (DCP)
- State Environmental Planning Policy (Biodiversity and Conservation 2021)

13. LIST OF APPENDICES

The following are included in the appendices:

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

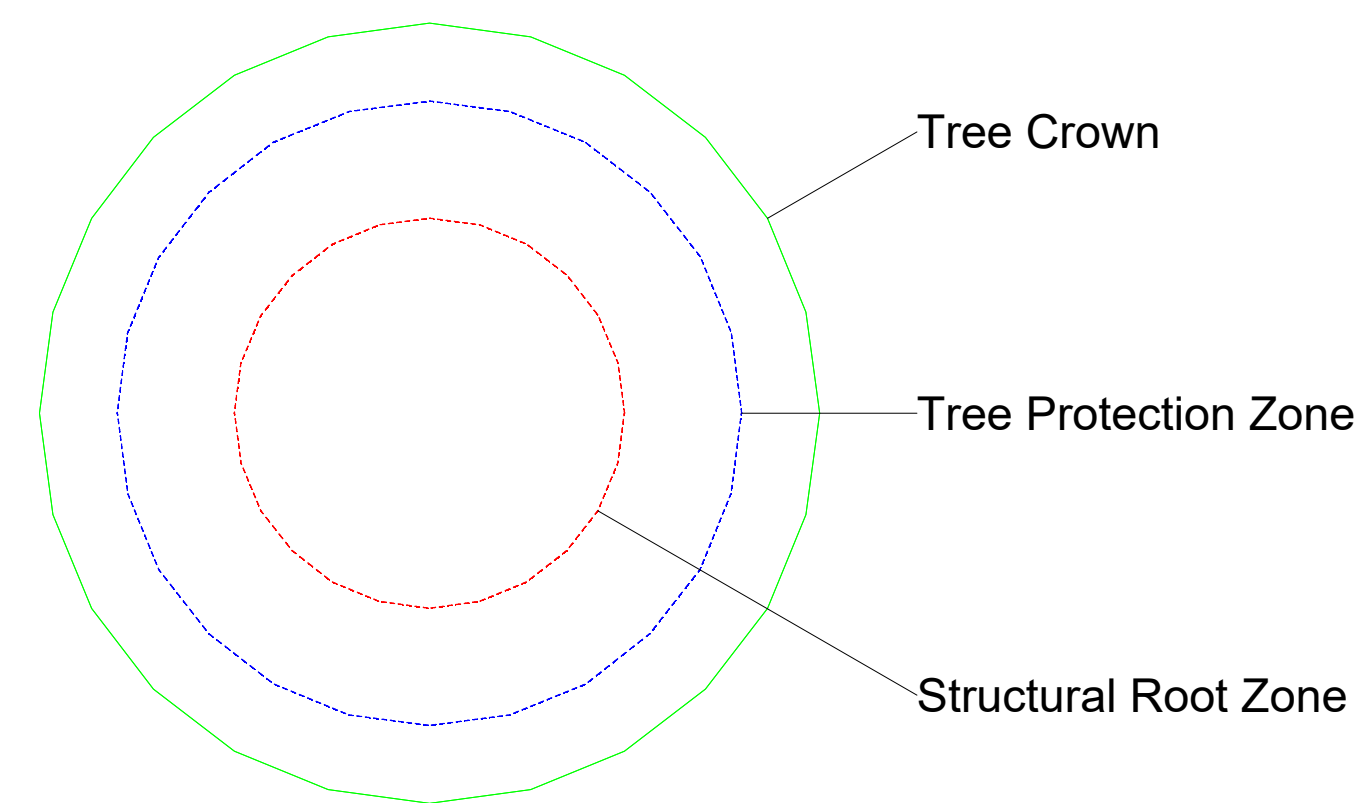
Hugh Millington



Diploma of Arboriculture (AQF5)
NC Forestry and Arboriculture III (UK)
RFS Tech. Cert. II (UK)
ISA Tree Risk Assessment Qualification
MAA, MISA

0426836701

hugh@hughtheArborist.com.au



hugh@hugththarborist.com.au
www.hugthearborist.com.au

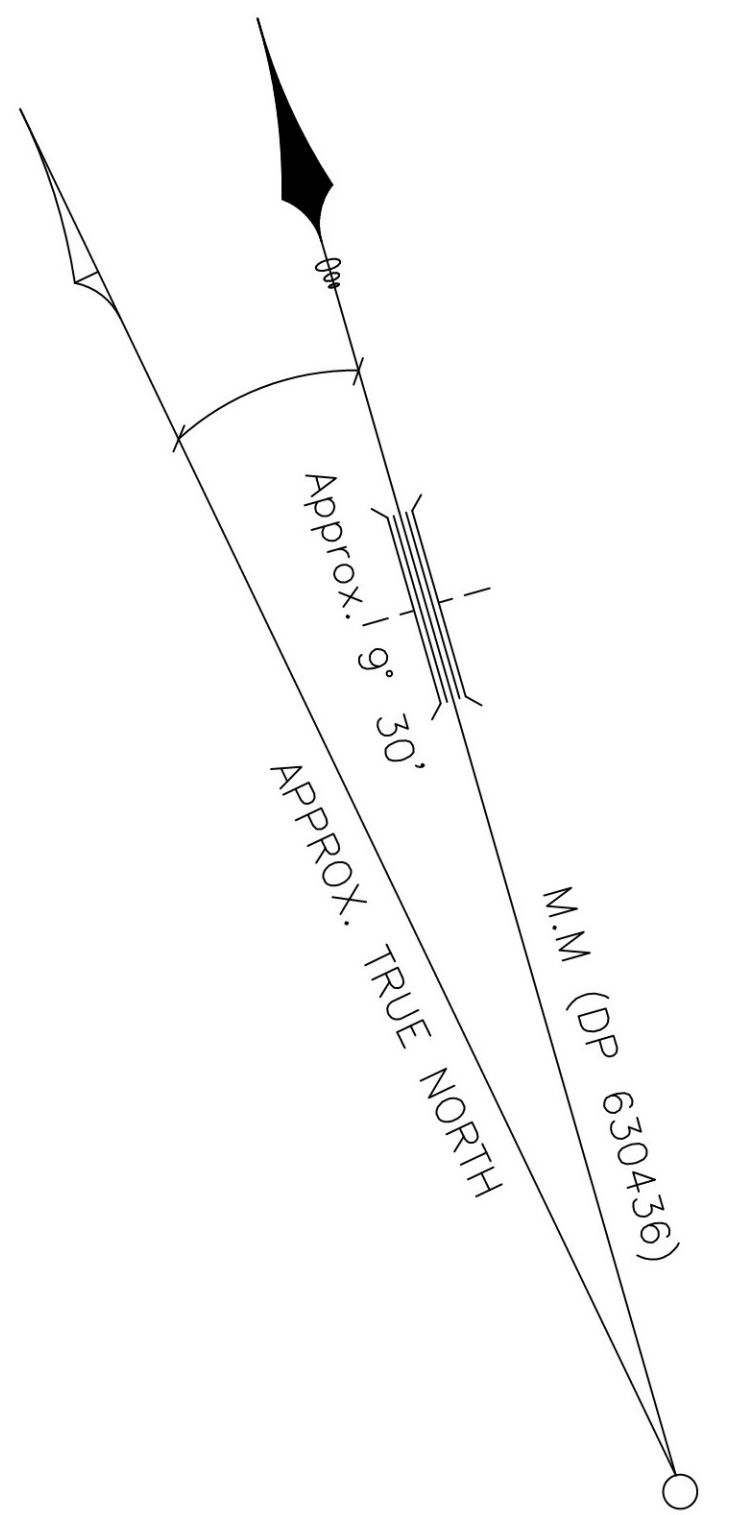
3 Coolawin Road Avalon NSW

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MAP FILENAME : Appendix 1 - Tree Location Plan



Prepared By Hugh The Arborist



Hugh The Arborist Pty Ltd

hugh@hughthearborist.com.au
www.hughthearborist.com.au


3 Coolawin Rd Avalon NSW

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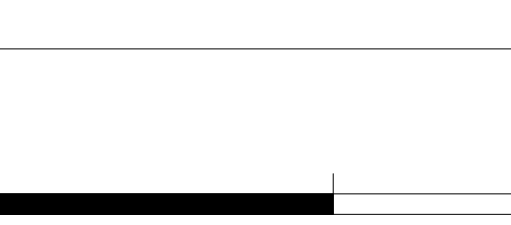
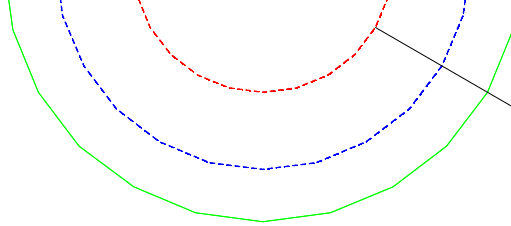
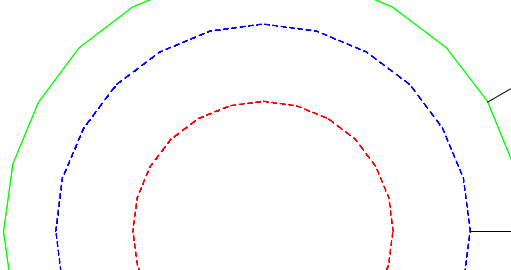
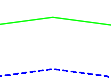

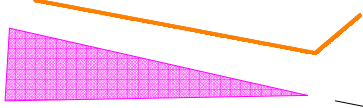
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16/05/2025

MAP FILENAME Appendix 1A - Proposed plan and Tree Protection Plan



HUGH
THE ARBORIST

Prepared by Hugh Millington



Fencing

Ground Protection

Trunk Protection

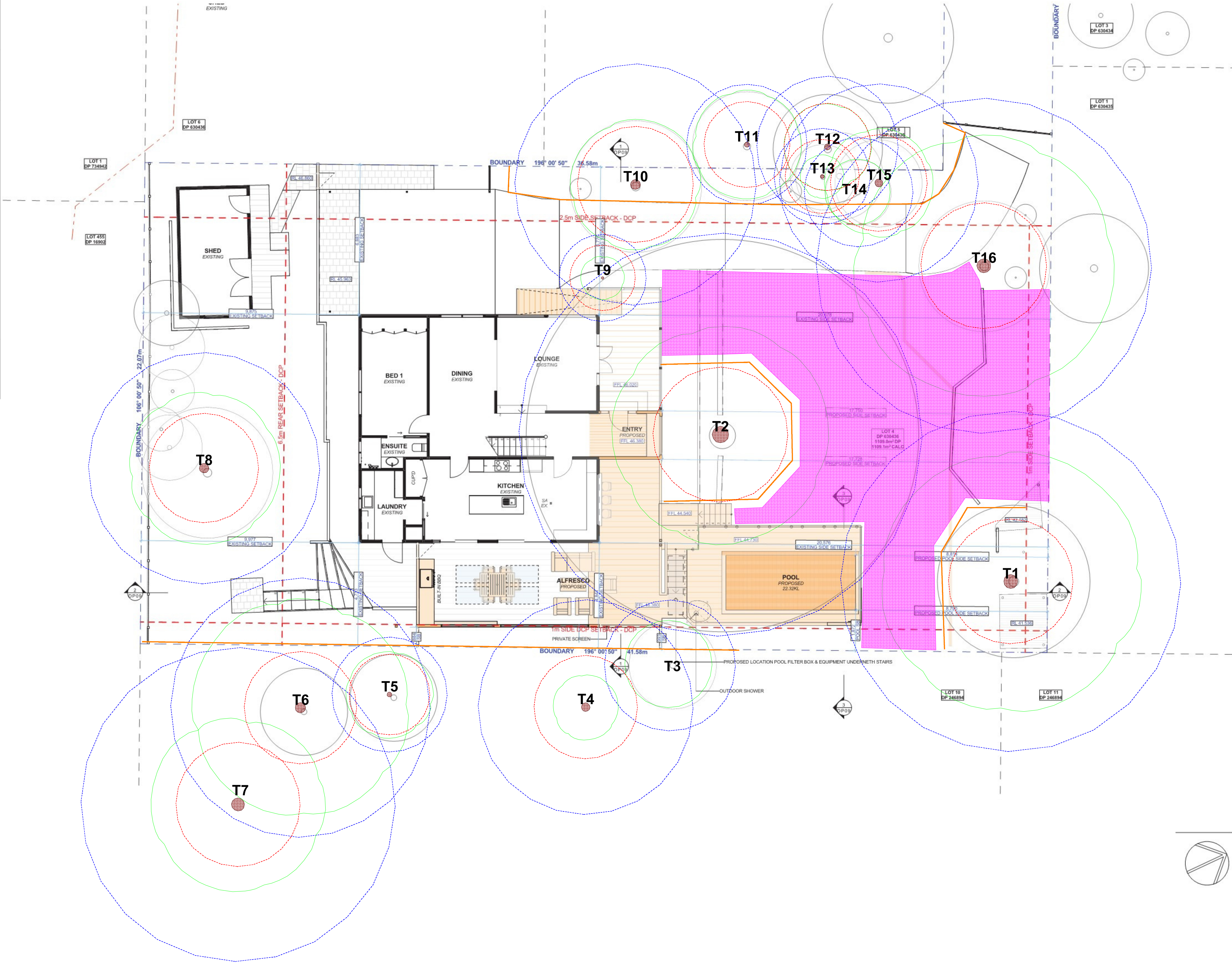
Tree Crown

Tree Protection Zone

Structural Root Zone

0

15m



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)	Stem 3	Stem 4	Stem 5	Stem 6	DBH (mm)	DAB (mm)	Health	Structure	Landscape Value	SULE	Trees AZ Value	TPZ Radius (m)	SRZ Radius (m)	Notes
1	Grey Ironbark	<i>Eucalyptus paniculata</i>	Mature	16	6	650						650	708	Good	Good	High	1. Long	A1	7.8	2.9	
2	Spotted Gum	<i>Corymbia maculata</i>	Mature	17	5	770						770	850	Good	Fair	High	1. Long	A1	9.2	3.1	Canopy asymmetric
3	Bangalow Palm	<i>Archontophoenix cunninghamiana</i>	Semi-mature	6	2	100						100	NA	Good	Good	Low	1. Long	Z3	2.0	NA	
4	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	7	1.5	410						410	450	Good	Good	Medium	1. Long	A1	4.9	2.4	Neighbors tree not on survey and estimated
5	Cheese Tree	<i>Glochidion ferdinandi</i>	Mature	6	2	220						220	250	Good	Good	Medium	1. Long	A1	2.6	1.8	Neighbors tree on higher rl
6	Flooded Gum	<i>Eucalyptus grandis</i>	Semi-mature	10	5	495						495	550	Fair	Good	Medium	2. Medium	A2	5.9	2.6	
7	Grey Gum	<i>Eucalyptus punctata</i>	Mature	12	4	600						600	700	Good	Fair	Medium	2. Medium	A2	2.0	2.8	Neighbors tree not on survey SB 7.7
8	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	9	3.5	442						442	520	Fair	Fair	Medium	2. Medium	A2	5.3	2.5	
9	Black Tea Tree	<i>Melaleuca Bracteata</i>	Semi-mature	5	1	120						120	150	Good	Good	Low	1. Long	Z2	2.0	1.5	Proximity
10	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	10	3	461						461	549	Good	Good	High	1. Long	A1	5.5	2.6	
11	Spotted Gum	<i>Corymbia maculata</i>	Semi-mature	9	2.5	230						230	290	Good	Good	High	1. Long	A1	2.8	2.0	
12	Grey Gum	<i>Eucalyptus punctata</i>	Semi-mature	12	2	270						270	301	Good	Good	High	1. Long	A1	3.2	2.0	
13	Broad Leaved Paperbark	<i>Melaleuca quinquenervia</i>	Semi-mature	7	1	108	110					184	205	Good	Good	Medium	1. Long	A1	2.2	1.7	
14	Cabbage Palm	<i>Livistona australis</i>	Young	4	1.5	300						300	NA	Good	Good	Low	1. Long	Z1	2.5	NA	
15	Black Tea Tree	<i>Melaleuca Bracteata</i>	Mature	8	2.5	379						379	385	Good	Good	Medium	1. Long	A1	4.5	2.2	
16	Spotted Gum	<i>Corymbia maculata</i>	Mature	17	6	640						640	720	Good	Good	High	1. Long	A1	7.7	2.9	

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’.

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

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

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

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

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

Health - Good/Fair/Poor/Dead

Structure - Good/Fair/Poor

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

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

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

(E) Indicates estimated measurements.

Appendix 3 – Assessment of Health

<u>Category</u>	<u>Example condition</u>	<u>Summary</u>
Good	<ul style="list-style-type: none">• Crown has good foliage density for species.• Tree shows no or minimal signs of pathogens that are unlikely to have an effect on the health of the tree.• Tree is displaying good vigour and reactive growth development.	<ul style="list-style-type: none">• The tree is in above average health and condition and no remedial works are required.
Fair	<ul style="list-style-type: none">• The tree may be starting to dieback or have over 25% deadwood.• Tree may have slightly reduced crown density or thinning.• There may be some discolouration of foliage.• Average reactive growth development.• There may be early signs of pathogens which may further deteriorate the health of the tree.• There may be epicormic growth indicating increased levels of stress within the tree.	<ul style="list-style-type: none">• The tree is in below average health and condition and may require remedial works to improve the trees health.
Poor	<ul style="list-style-type: none">• The may be in decline, have extensive dieback or have over 30% deadwood.• The canopy may be sparse or the leaves may be unusually small for species.• Pathogens or pests are having a significant detrimental effect on the tree health.	<ul style="list-style-type: none">• The tree is displaying low levels of health and removal or remedial works may be required.
Dead	<ul style="list-style-type: none">• The tree is dead or almost dead.	<ul style="list-style-type: none">• The tree should generally be removed.

Appendix 4 Landscape Value

RATING	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1. SIGNIFICANT	The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed on Council's Significant Tree Register	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999	The subject tree has a very large live crown size exceeding 300m ² with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species
	The subject tree forms part of the curtilage of a Heritage Item (building /structure /artefact as defined under the LEP) and has a known or documented association with that item	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to Commemorate an important historical event	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally-indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 200m ² ; a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence	The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link / Wildlife Corridor or has known wildlife habitat value	The subject tree has a large live crown size exceeding 100m ² ; The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% normal); The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this DCP.	The subject tree has a medium live crown size exceeding 40m ² ; The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crowndensity of more than 50% (thinning to normal); and The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a heritage item	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown size of less than 40m ² and can be replaced within the short term (5-10 years) with new tree planting
6. VERY LOW	The subject tree is causing significant damage to a heritage Item.	The subject tree is listed as an Environment Weed Species in the Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).
7. INSIGNIFICANT	The tree is completely dead and has no visible habitat value	The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993 within the relevant Local Government Area.	The tree is completely dead and represents a potential hazard.

Appendix 5 - Age class

Determining the exact age of a tree is difficult without carrying out potentially invasive testing. The age class of the subject tree has been estimated using the definitions below.

<u>Category</u>	<u>Description</u>
Young/Newly planted	<ul style="list-style-type: none">• Young or recently planted tree.
Semi Mature	<ul style="list-style-type: none">• Up to 20% of the usual life expectancy for the species.
Early mature/Mature	<ul style="list-style-type: none">• Between 20% - 80% of the usual life expectancy for the species.
Over mature	<ul style="list-style-type: none">• Over 80% of the usual life expectancy for the species.
Dead	<ul style="list-style-type: none">• Tree is dead or almost dead.

Appendix 6 - Structural condition

<u>Category</u>	<u>Example condition</u>	<u>Summary</u>
Good	<ul style="list-style-type: none">• Branch unions appear to be strong with no sign of defects.• There are no significant cavities.• The tree is unlikely to fail in usual conditions.• The tree has a balanced crown shape and form.	<ul style="list-style-type: none">• The tree is considered structurally good with well developed form.
Fair	<ul style="list-style-type: none">• The tree may have minor structural defects within the structure of the crown that could potentially develop into more significant defects.• The tree may have a cavity that is currently unlikely to fail but may deteriorate in the future.• The tree is an unbalanced shape or leans significantly.• The tree may have minor damage to its roots.• The root plate may have moved in the past but the tree has now compensated for this.• Branches may be rubbing or crossing.	<ul style="list-style-type: none">• The identified defects are unlikely cause major failure.• Some branch failure may occur in usual conditions.• Remedial works can be undertaken to alleviate potential defects.
Poor	<ul style="list-style-type: none">• The tree has significant structural defects.• Branch unions may be poor or weak.• The tree may have a cavity or cavities with excessive levels of decay that could cause catastrophic failure.• The tree may have root damage or is displaying signs of recent movement.• The tree crown may have poor weight distribution which could cause failure.	<ul style="list-style-type: none">• The identified defects are likely to cause either partial or whole failure of the tree.

Appendix 7 - Safe Useful Life Expectancy (SULE), (Barrel, 2001)

A tree's 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	Useful life expectancy over 40 years
2. Medium	Useful life expectancy 15 to 40 years
3. Short	Useful life expectancy 5 to 15 years
4. Remove	Useful life expectancy under 5 years
5. Small/Young	Trees that could be transplanted or replaced with similar specimen.
6. Unstable	Tree has become hazardous or structurally unstable.

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 <u>cannot</u> 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 <u>temporarily</u> 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.

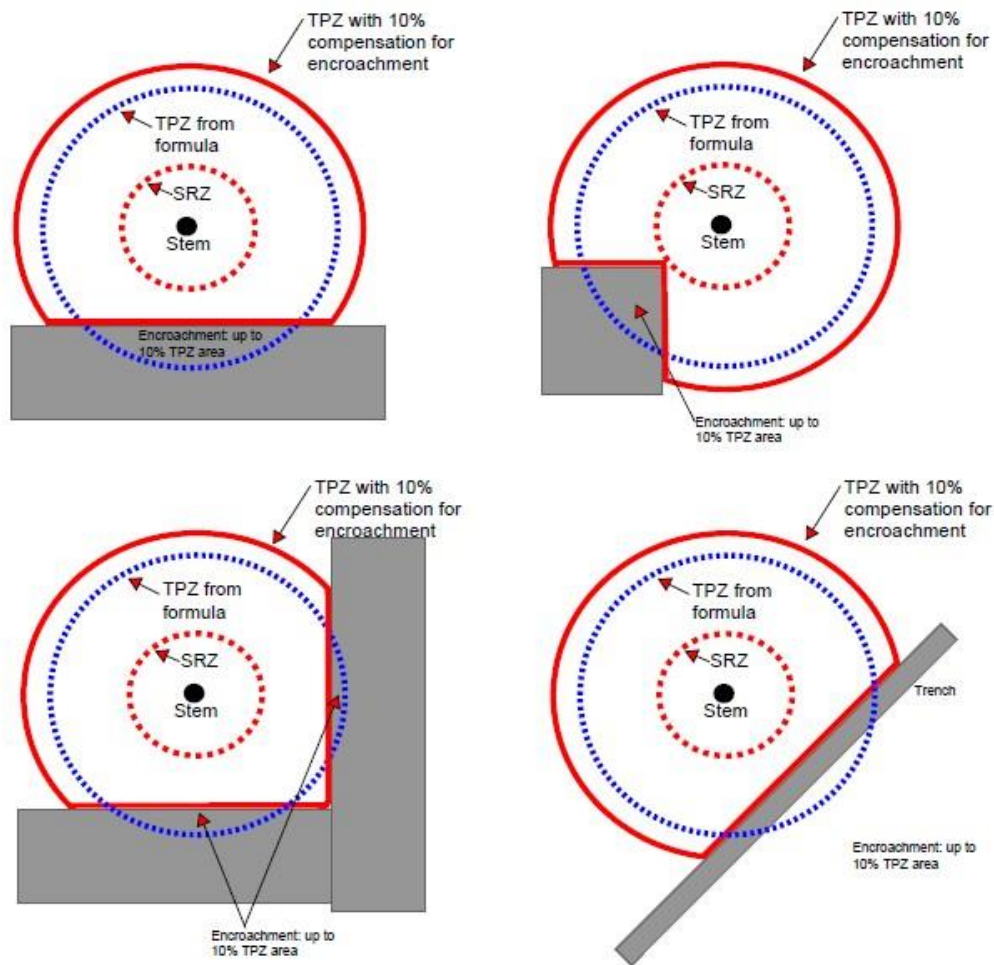
Category A: Important trees suitable for retention for more than 10 years and worthy of being a material constraint

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.

Appendix 9 – Examples of TPZ Encroachment

Encroachment into the Tree Protection Zone is sometimes unavoidable. The following diagram shows examples of acceptable levels of encroachment and how they may be compensated for by providing additional space contiguous to the TPZ area.



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