



## Arboricultural Impact Assessment Report

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## 1. INTRODUCTION

- 1.1 This report has been commissioned By Sanctum Design on behalf of Kevin Mooney to provide an Arboricultural Impact Assessment Report for trees located on and adjoining the site in relation to a proposed development.
- 1.2 All tree data was collected during one site inspection that was carried out on Wednesday 15<sup>th</sup> August 2019.

**Table 1: documents provided:**

A 00 COVERPAGE		A 15 NORTH ELEVATION	1:100
A 00 SURVEY		A 16 3D VIEWS	
A 01 SITE PLAN	1:200	A 17 AREA CALCULATIONS	1:250
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## 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 sixteen trees located on and adjoining the site as identified on the plans provided. For the purpose of this report, a tree taken to have height greater than 5 metres.
- 2.1.2 Determine the trees estimated contribution years and remaining, useful life expectancy and award the trees a retention value.
- 2.1.3 Provide an assessment of the potential impact the proposed development is likely to cause to the condition of the subject trees in accordance with AS4970 Protection of trees on development sites (2009).
- 2.1.4 Provide pragmatic recommendations for the management of trees and mitigation of construction impacts on retained trees.
- 2.1.5 Specify tree protection measures for trees to be retained in accordance with AS 4970-2009.

### 3. LIMITATIONS

- 3.1 The findings of this report are based on the observations and site conditions at the time of inspection.
- 3.2 Where access was limited, measurements have been estimated.
- 3.3 All of the observations were carried out from ground level. The accuracy of the assessment of the subject trees structural condition and health is limited to the visibility of the tree at the time of inspection.
- 3.4 The tree inspections were visual from ground level only. No soil or tissue testing was carried out as part of the tree inspection. None of the surrounding surfaces adjacent to trees were lifted or removed during the tree inspections.
- 3.5 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.
- 3.6 The report reflects the subject tree(s) as found on the day of inspection. Any changes to the growing environment of the subject tree, or tree management works beyond those recommended in this report may alter the findings of the report. There is no warranty, expressed or implied, that problems or deficiencies relating to the subject tree, or subject site may not arise in the future.
- 3.7 Tree identification is based on accessible visual characteristics at the time of inspection. As key identifying features are not always available the accuracy of identification is not guaranteed. Where tree species is unknown, it is indicated with a spp.
- 3.8 All diagrams, plans and photographs included in this report are visual aids only, and are not to scale unless otherwise indicated.
- 3.9 Hugh The Arborist neither guarantees, nor is responsible for, the accuracy of information provided by others that is contained within this report.
- 3.10 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.
- 3.11 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.

3.12 Alteration of this report invalidates the entire report.

## 4. METHODOLOGY

- 4.1 The following information was collected during the assessment of the subject tree(s).
  - 4.1.1 Tree common name
  - 4.1.2 Tree botanical name
  - 4.1.3 Tree age class
  - 4.1.4 DBH (Trunk/Stem diameter at breast height/1.4m above ground level) - millimetres.
  - 4.1.5 Estimated height - metres
  - 4.1.6 Estimated crown spread (Radius of crown) - metres
  - 4.1.7 Health
  - 4.1.8 Structural condition
  - 4.1.9 Amenity value
  - 4.1.10 Estimated remaining contribution years (SULE)<sup>1</sup>
  - 4.1.11 Retention value (Tree AZ)<sup>2</sup>
  - 4.1.12 Notes/comments
- 4.2 An assessment of the trees condition was made using the visual tree assessment (VTA) model (Mattheck & Breloer, 1994).<sup>3</sup>
- 4.3 Tree diameter was measured using a DBH tape or in some cases estimated. All other measurements were estimations unless otherwise stated. The other tools I used during the assessment were a digital camera, Japanese made 170mm blade digging knife and a Leica DistoD410 digital laser tape.
- 4.4 All DBH measurements, tree protection zones, and structural root zones were calculated in accordance with methods set out in AS4970 Protection of trees on development sites (2009). See appendices for more information.
- 4.5 Details of how the observations in this report have been assessed are listed in the appendices.

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

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

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

## 5. SITE LOCATION AND BRIEF DESCRIPTION OF THE PROPOSAL

- 5.1 The site is located in the Northern Beaches Council suburb of Balgowlah Heights. All trees at the site are managed under the Warringah Local Environmental Plan (LEP) 2011<sup>4</sup>, Warringah Development Control Plan (DCP) 2011, Northern Beaches Tree Management Controls and State Environmental Planning Policy (Vegetation in Non-Rural Areas 2017).
- 5.2 The site is a corner block flanked by Tabalum Road and Cutler Road. The site falls significantly from the north east to the south west. The front of the site is east facing and contains all planted vegetation, predominantly Palm trees and succulent vegetation.
- 5.3 The site has not been identified as containing high terrestrial biodiversity. It is not located within a Heritage Conservation Area however has been identified as within the Scenic Foreshore Protection Area.<sup>5</sup>
- 5.4 The proposed development consists of the demolition of the existing structures and the development of a new residence with associated ancillary structures.

### **Tile 1: Site Location<sup>6</sup>**



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

<sup>5</sup> <https://services.northernbeaches.nsw.gov.au/icongis/index.html>

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

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

- 6.1 **Tree information:** Details of each individual tree assessed, including the observations taken during the site inspection, can be found in the tree inspection schedule in appendix 2, where the indicative tree protection zone (TPZ) and Structural Root Zone (SRZ) has been calculated for each of the subject trees. The TPZ and SRZ should be measured in radius from the centre of the trunk. Each of the subject trees have been awarded a retention value based on the observations using the Tree AZ method. Tree AZ is used to identify higher value trees worthy of being a constraint to development and lower value trees that should generally not be a constraint to the development. The Tree AZ categories sheet (Barrell Tree Consultancy) has been included in appendix 3 to assist with understanding the retention values. The retention value that has been allocated to the subject trees in this report is not definitive and should only be used as a guideline.
- 6.2 **Site plan:** Appendix 1 contains an existing site plan. Appendix 1A contains a site plan showing the proposal and the subject trees locations, appendix 1B contains a tree protection plan. Information including canopy spread, TPZ and SRZ have been overlaid on both plans.
- 6.3 **Tree protection zone (TPZ):** The TPZ is the principle means of protecting trees on development sites and is an area required to maintain the viability of trees during development. It is commonly observed that tree roots will extend significantly further than the indicative TPZ, however the TPZ is an area identified in AS4970-2009 to be the area where root loss or disturbance will generally impact the viability of the tree. The TPZ is identified as a restricted area to prevent damage to trees either above or below ground during a development. Where trees are intended to be retained proposed developments must provide an adequate TPZ around trees. The TPZ is set aside for the tree's root zone, trunk and crown and it is essential for the stability and longevity of the tree. The TPZ also incorporates the SRZ (see below for more information about the SRZ). The TPZ is calculated by multiplying the DBH by twelve, with the exception of palms, other monocots, cycads and tree ferns, the TPZ of which have been calculated at one metre outside the crown projection. Additional information about the TPZ is included in appendix 3.



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

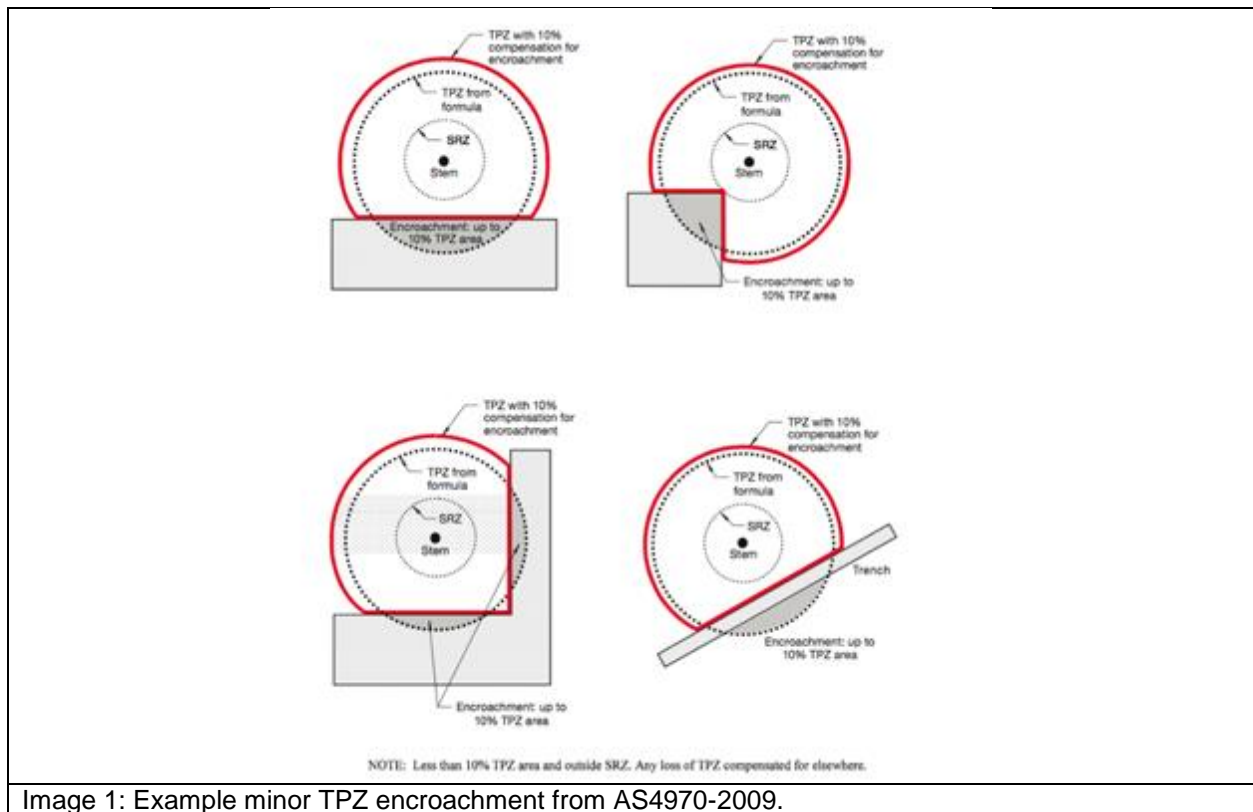


Image 1: Example minor TPZ encroachment from AS4970-2009.



- 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. Root investigations may be required to identify roots that will be impacted during major TPZ encroachment (see appendix 3 for more information in relation to root investigations).

## 7. ASSESSEMENT OF CONSTRUCTION IMPACTS

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

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
1	<i>Hymenosporum flavum</i> (Native Frangipanni)	A1	2.8	1.9	Footprint	Council owned street tree located within the footprint of the proposed driveway and garage, see plan A06 Garage. Tree is not retainable under the current Proposal.	Remove and replace
2	<i>Acmenia smithii</i> (Lilly Pilly)	Z4	3.8	2.2	Footprint	Tree located within the footprint of the proposed driveway and garage, see plan A06 Garage. Tree is not retainable under the current Proposal. Tree 2 has been identified as having a short SULE due to apical decline and heavy defoliation from animals.	Remove and replace
3	<i>Livistona australis</i> (Cabbage Palm)	A1	3	-	Major	Tree set back 0.9 meters from the proposed retaining wall for the driveway. This will contribute a major encroachment of up to 31% into the TPZ. While this is considered to be a major encroachment, Palms are commonly transplanted requiring severance of the TPZ on all sides. Encroachment of up to 31% may be managed at an acceptable level contributing a low to moderate impact on the trees health in the short term. This is achievable providing appropriate care and protection is provided during the development inclusive of the correct pruning of tree roots.  In addition, if the Palm is to be retained in situ, it is recommended that no other structures be placed within 3 meters of the tree.	Retain and protect.
4	<i>Waterhousia floribunda</i> (Giant Weeping Lilly Pilly)	A1	2	1.7	Footprint	Tree located within the footprint of the proposed driveway and garage, see plan A06 Garage. Tree is not retainable under the current Proposal.	Remove and replace

Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
5	<i>Livistona australis</i> (Cabbage Palm)	A1	3	-	Footprint	Tree located within the footprint of the proposed dwelling, see plan A07/A08 Level 2. Tree 5 is a locally indigenous Palm tree and its transplant should be considered to relocate it to outside of the development footprint and into the landscape proposal.	Transplant
6	<i>Livistona australis</i> (Cabbage Palm)	Z1	3	-	Footprint	Tree located within the footprint of the proposed dwelling, see plan A07/A08 Level 2. Tree 6 is a locally indigenous Palm tree and its transplant should be considered to relocate it to outside of the development footprint and into the landscape proposal.	Transplant
7	<i>Livistona australis</i> (Cabbage Palm)	A1	3	-	Major	Major encroachment of up to 12% from the proposed dwelling. The associated impact from the construction of the dwelling is likely to have only a low impact on the health of the tree on the provision tree roots are pruned in accordance with Australian Standards. There is potential for further disturbance through landscaping however this may be minimized by installing tree protection during the construction phases.	Retain and protect
8	Yucca Spp.	Z3	2	-	Footprint	Tree located within the footprint of the proposed dwelling, see plan A07 Level 2. Tree is not retainable under the current proposal. Species is not protected in NBLGA.	Remove and replace



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Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
9	Yucca Spp.	Z3	2	-	Footprint	Tree located within the footprint of the proposed dwelling, see plan A07 Level 2. Tree is not retainable under the current proposal. Species is not protected in NBLGA.	Remove and replace
10	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	Z3	3	-	None	Tree located on neighboring property. The tree is situated behind a stone wall and raised above the ground level of the subject site. The TPZ area is contained within the neighboring property and will not be impacted by the proposed development.	Retain and protect
11	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	Z3	3	-	None	Tree located on neighboring property. The tree is situated behind a stone wall and raised above the ground level of the subject site. The TPZ area is contained within the neighboring property and will not be impacted by the proposed development.	Retain and protect
12	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	Z3	2	-	None	Tree located on neighboring property. The tree is situated behind a stone wall and raised above the ground level of the subject site. The TPZ area is contained within the neighboring property and will not be impacted by the proposed development.	Retain and protect
13	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	Z3	2	-	None	Tree located on neighboring property. The tree is situated behind a stone wall and raised above the ground level of the subject site. The TPZ area is contained within the neighboring property and will not be impacted by the proposed development.	Retain and protect



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Tree ID	Species	Retention value	TPZ radius (m)	SRZ radius (m)	TPZ encroachment	Discussion/ Conclusion	Recommendation
14	<i>Howea forsteriana</i> (Kentia Palm)	Z3	3	-	None	Tree located on neighboring property. The tree is situated behind a stone wall and raised above the ground level of the subject site. The TPZ area is contained within the neighboring property and will not be impacted by the proposed development.	Retain and protect
15	<i>Howea forsteriana</i> (Kentia Palm)	Z3	3	-	Footprint	Tree is located within the footprint of the proposed dwelling, see plan A06 Level 1. Species is listed as exempt from protection in NBLGA.	Remove and replace
16	<i>Backhousia myrtifolia</i>	Z4	2	1.7	Footprint	Tree is located within the footprint of the proposed dwelling. See plan A07 Level 2. Tree has been identified as having a short SULE and in decline at the time of the inspection.	

## 8. CONCLUSIONS

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

Impact	Reason	Category A	Category Z
		A	Z
Trees to be removed	Building/landscape construction, new surfacing and/or proximity, or trees in poor condition.	1,4 (Two Trees)	2,8,9,15,16 (Five Trees)
Retained trees subject to TPZ encroachment	Removal of existing surfacing/structures and/or installation of new surfacing/structures will not significantly impact the tree	3, 7 (Two Trees)	None
Retained trees subject to no TPZ encroachment	Located outside of the construction area	None	10,11,12,13,14 (Five Trees)
Trees to be transplanted	High value trees and Palms that will tolerate relocation may be given additional consideration	5 (One Tree)	6 (One Tree)



## 9. PHOTOGRAPHS



**Photo A:** Trees 1, 2, 3 and 4.



**Photo B:** Vegetation exempt from protection to the north of the site.



**Photo C:** Tree 16 in a state of decline.

## **10. RECOMMENDATIONS**

- 10.1 This report assesses the impact of a proposed development at the site to sixteen trees located on and adjoining the site.
- 10.2 Trees that will require removal to facilitate the development consist of two category A trees and five category Z trees. The category Z trees are species not protected in the Northern Beaches LGA, have short useful life expectancies or are below five metres in height.
- 10.3 It is recommended all trees removed through the development process are replaced with a species and ratio consistent with Councils tree and landscape management objectives.
- 10.4 Two category A trees located on the site may be retained under an acceptable level of impact on the provision they are provided protection and management during the development process. No neighbouring trees will be impacted by the proposed development.
- 10.5 Two trees (5 and 6) are recommended to be transplanted from the south eastern corner of the site to an area suitable for them to be retained and managed in the long term. It is recommended they be relocated outside of the development footprint to an area that can be fenced off for the entire duration of the works and trees can begin reestablishment. Landscape plans are to detail the trees new location within the site.
- 10.6 It is recommended if the Palms are to be approved for transplant, a detailed work method statement, management and protection plan specific to transplanting be prepared to ensure their viability in the long term.
- 10.7 Tree number 3 will require manual excavations at the edge of the proposed driveway cut (western side of the tree) to locate and prune roots clear of the proposal. The Project Arborist is to oversee the excavations and certify the roots have been pruned clear of the development area.
- 10.8 Manual excavations will be required within three metres of retained tree number 7. The Project Arborist is to oversee the excavations and certify the roots have been pruned clear of the development area.
- 10.9 It is recommended that no other structures be installed within 3 metres of tree numbers 3 and 7 to minimise development impacts.
- 10.10 All root pruning is to be carried out in accordance with AS4373 Pruning of Amenity Trees (2007).
- 10.11 All works within the TPZ and SRZ of retained trees are to be overseen by an AQF5 Consulting Arborist to assist with minimising development impact.

- 10.12 No services plan has been assessed in this report, all services plans should be subject to review by a consulting Arborist. Where possible underground services should be located outside the TPZ of trees to be retained. All underground services located inside the TPZ of any tree to be retained must be installed via tree sensitive techniques. This should include either directional drilling methods or manual excavations to minimise the impact to trees identified for retention.

## **11. ARBORICULTURAL WORK METHOD STATEMENT (AMS) AND TREE PROTECTION REQUIREMENTS**

- 11.1 **Use of this report:** All contractors must be made aware of the tree protection requirements prior to commencing works at the site and be provided a copy of this report.
- 11.2 **Project Arborist:** Prior to any works commencing at the site a project Arborist should be appointed. The project Arborist should be qualified to a minimum AQF level 5 and/or equivalent qualifications and experience, and should assist with any development issues relating to trees that may arise. If at any time it is not feasible to carryout works in accordance with this, an alternative must be agreed in writing with the project Arborist.
- 11.3 **Tree work:** All tree work must be carried out by a qualified and experienced Arborist with a minimum of AQF level 3 in arboriculture, in accordance with NSW Work Cover Code of Practice for the Amenity Tree Industry (1998) and AS4373 Pruning of amenity trees (2007).
- 11.4 **Initial site meeting/on-going regular inspections:** The project Arborist is to hold a pre-construction site meeting with principle contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to tree protection that may arise. In accordance with AS4970-2009, the project Arborist should carryout regular site inspections to ensure works are carried out in accordance with this document throughout the development process. I recommend regular site inspections on a frequency based on the longevity of the project, this is to be agreed in the initial meeting.

### 11.5 Site Specific Tree Protection Recommendations:

**Table 5: Protection Requirements:** See appendix 1B for indicative protection location.

Tree Number	Protection Specification
3	<ul style="list-style-type: none"> <li>- Tree protective fencing to be installed at 0.9m to the west and 3 metres elsewhere.</li> <li>- Application of mulch within the fenced area for the duration of works.</li> </ul>
5 and 6	<ul style="list-style-type: none"> <li>- Protective fencing to be installed in the location specified by the Landscape Architect in trees new location on site. Recommendations in the transplant management plan are to be implemented and followed by the Project Arborist.</li> </ul>
7	<ul style="list-style-type: none"> <li>- Tree protective fencing to be installed at 1.6 metres west and three metres elsewhere.</li> <li>- Application of mulch within the fenced area for the duration of works.</li> </ul>
10 through 14 inclusive	Neighbouring trees will be protected by the existing boundary wall and site fencing as exclusion. No additional protection required.

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

**11.7 Protective fencing:** Where it is not feasible to install fencing at the specified location due to factors such restricting access to areas of the site or for constructing new structures, an alternative location and protection specification must be agreed with the project Arborist. Where the installation of fencing is unfeasible due to restrictions on space, trunk and branch protection will be required (see below). The protective fencing must be constructed of 1.8 metre 'cyclone chainmesh fence'. The fencing must only be removed for the landscaping phase and must be authorised by the project Arborist. Any modifications to the fencing locations must be approved by the project Arborist.

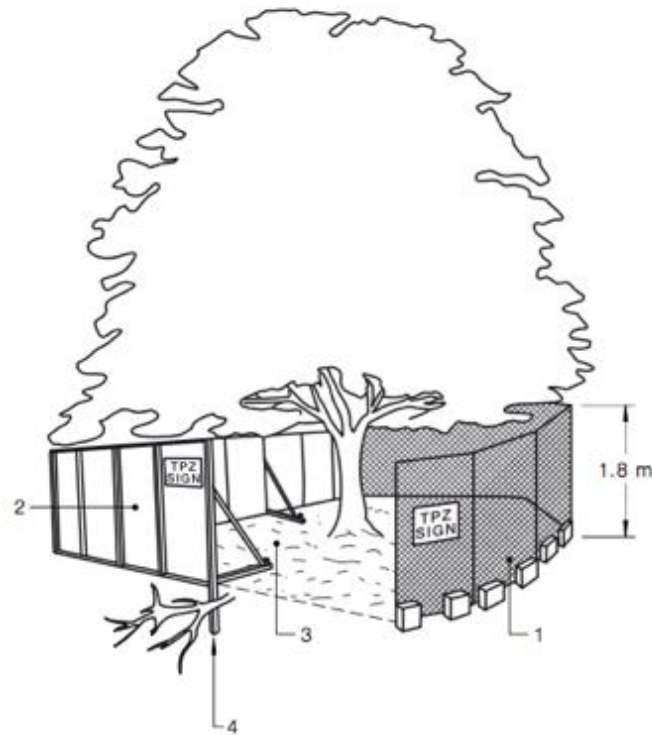
**11.8 TPZ signage:** Tree protection signage is to be attached to the protective fencing, displayed in a prominent position and the sign repeated at 10 metres intervals or closer where the fence changes direction. Each sign shall contain in a clearly legible form, the following information:

- Tree protection zone/No access.



- This fence has been installed to prevent damage to the tree/s and their growing environment both above and below ground. Do not move fencing or enter TPZ without the agreement of the project Arborist.
  - The name, address, and telephone number of the developer/builder and project Arborist
- 11.9 **Trunk and Branch Protection:** The trunk must be protected by wrapped hessian or similar material to limit damage. Timber planks (50mm x 100mm or similar) should then be placed around tree trunk. The timber planks should be spaced at 100mm intervals, and must be fixed against the trunk with tie wire, or strapping and connections finished or covered to protect pedestrians from injury. The hessian and timber planks must not be fixed to the tree in any instance. The trunk and branch protection shall be installed prior to any work commencing on site and shall be maintained in good condition for the entire development period.
- 11.10 **Mulch:** Any areas of the TPZ located inside the subject site (only trees to be retained directly adjacent to site works must be mulched to a depth of 75mm with good quality composted wood chip/leaf mulch.
- 11.11 **Ground Protection:** Ground protection is required to protect the underlying soil structure and root system in areas where it is not practical to restrict access to whole TPZ, while allowing space for construction. Ground protection must consist of good quality composted wood chip/leaf mulch to a depth of between 150-300mm, laid on top of geo textile fabric, overlaid with durable timber boards/plywood. If vehicles are to be using the area, additional protection will be required such as rumble boards or track mats to spread the weight of the vehicle and avoid load points. Ground protection is to be specified by the project Arborist as required.



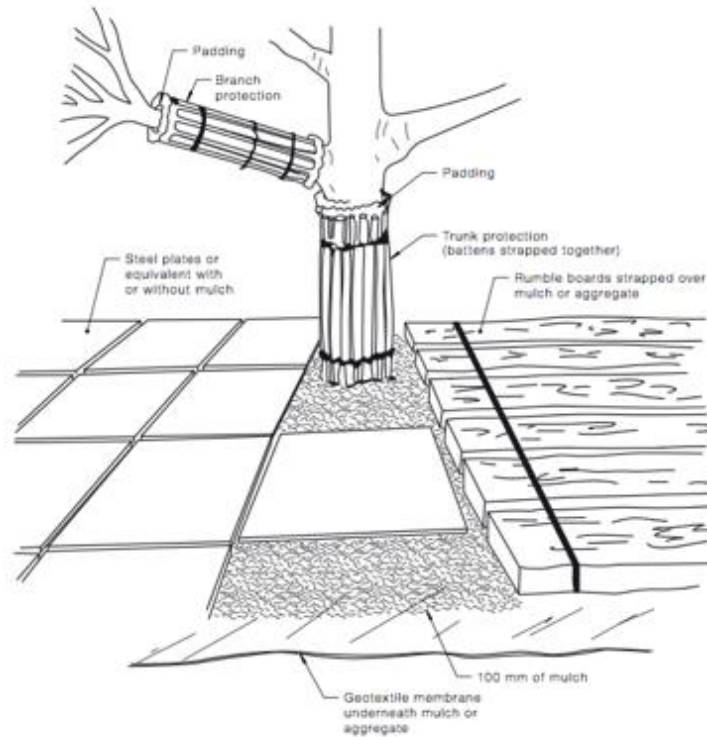


**LEGEND:**

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

An image from AS4970-2009,<sup>7</sup> with example tree protection.

<sup>7</sup> 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,<sup>8</sup> with example tree protection.

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

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

<sup>8</sup> Council of Standards Australia, *AS4970 Protection of trees on development sites* (2009), page 17.

- G) Wash down and cleaning of equipment.
  - H) Placement of fill.
  - I) Lighting of fires.
  - J) Soil level changes.
  - K) Any physical damage to the crown, trunk, or root system.
  - L) Parking of vehicles.
- 11.13 **Demolition:** The demolition of all existing structures inside or directly adjacent to the TPZ of trees to be retained must be undertaken in consultation with the project Arborist. Any machinery is to work from inside the footprint of the existing structures or outside the TPZ, reaching in to minimise soil disturbance and compaction. If it is not feasible to locate demolition machinery outside the TPZ of trees to be retained, ground protection will be required. The demolition should be undertaken inwards into the footprint of the existing structures, sometimes referred to as the 'top down, pull back' method.
- 11.14 **Excavations:** The project Arborist must supervise and certify that all excavations and root pruning are in accordance with AS4373-2007 and AS4970-2009. For continuous strip footings, first manual excavation is required along the edge of the structures closest to the subject trees. Manual excavation should be a depth of 1 metre (or to unfavourable root growth conditions such as bed rock or heavy clay, if agreed by project Arborist). Next roots must be pruned back in accordance with AS4373-2007. After all root pruning is completed, machine excavation is permitted within the footprint of the structure. For tree sensitive footings, such as pier and beam, all excavations inside the TPZ must be manual. Manual excavation may include the use of pneumatic and hydraulic tools, high-pressure air or a combination of high-pressure water and a vacuum device. No pruning of roots greater 30mm in diameter is to be carried out without approval of the project arborist. All pruning of roots greater than 10mm in diameter must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3. Root pruning is to be a clean cut with a sharp tool in accordance with AS4373 Pruning of amenity trees (2007).<sup>9</sup> The tree root is to be pruned back to a branch root if possible. Make a clean cut and leave as small a wound as possible.
- 11.15 **Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimize the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.

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<sup>9</sup> Council Of Standards Australia, *AS 4373 Pruning of amenity trees* (2007) page 18

- 11.16 **Landscaping:** All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with a consulting Arborist to minimize the impact to trees. General guidance is provided below to minimise the impact of new landscaping to trees to be retained.
- Level changes should be minimised. The existing ground levels within the landscape areas should not be lowered by more than 50mm or increased by more 100mm without assessment by a consulting Arborist.
  - New retaining walls should be avoided. Where new retaining walls are proposed inside the TPZ of trees to be retained, they should be constructed from tree sensitive material, such as timber sleepers, that require minimal footings/excavations. If brick retaining walls are proposed inside the TPZ, 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 30mm in diameter.
- 11.17 **Sediment and Contamination:** All contamination run off from the development such as but not limited to concrete, sediment and toxic wastes must be prevented from entering the TPZ at all times.
- 11.18 **Tree Wounding/Injury:** Any wounding or injury that occurs to a tree during the construction process will require the project Arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. It is generally accepted that trees may take many years to decline and eventually die from root damage. All repair work is to be carried out by the project Arborist, at the contractor's expense.

- 11.19 **Completion of Development Works:** After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigour. If changes to condition are identified the project Arborist should provide recommendations for remediation.

## 12. HOLD POINTS

- 12.1 **Hold Points:** Below is a sequence of hold points requiring project Arborist certification throughout the development process. It provides a list of hold points that must be checked and certified. All certification must be provided in written format upon completion of the development. The final certification must include details of any instructions for remediation undertaken during the development.

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

Hold Point	Stage	Responsibility	Certification	Complete Y/N and date
Project Arborist to hold pre construction site meeting with principle contractor to discuss methods and importance of tree protection measures and resolve any issues in relation to feasibility of tree protection requirements that may arise.	Prior to work commencing.	Principle contractor	Project Arborist	
Project Arborist to assess and certify that tree protection has been installed in accordance with development conditions and AS4970-2009 prior to works commencing at site.	Prior to development work commencing.	Principle contractor	Project Arborist	
In accordance with AS4970-2009 the project arborist should carryout regular site inspections to ensure works are carried out in accordance with the recommendations.	Ongoing throughout the development	Principle contractor	Project Arborist	
Project Arborist to oversee all manual excavations 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 has been carried out in accordance with AS4373-2007. All root pruning must be carried out by a qualified Arborist/Horticulturalist with a minimum AQF level 3.	Construction	Principle contractor	Project Arborist	
Project Arborist to certify that all underground services including storm water inside TPZ of any tree to be retained have been installed in accordance with AS4970-2009.	Construction	Principle contractor	Project Arborist	
Project arborist to approve relocation of tree protection for landscaping. All landscaping works within the TPZ of trees to be retained are to be undertaken in consultation with the project Arborist to minimize the impact to trees.	Landscape	Principle contractor	Project Arborist	
After all construction works are complete the project Arborist should assess that the subject trees have been retained in the same condition and vigor and authorize the removal of protective fencing. If changes to condition are identified the project Arborist should provide recommendations for remediation.	Upon completion of construction	Principle contractor	Project Arborist	
Any wounding or injury that occurs to a tree during the demolition/construction process will require the project arborist to be contacted for an assessment of the injury and provide mitigation/remediation advice. All remediation work is to be carried out by the project arborist, at the contractor's expense.	Ongoing throughout the development	Principle contractor	Project Arborist	



### 13. BIBLIOGRAPHY/REFERENCES

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- Barrell, J. (2001), 'SULE: Its use and status in the new millennium' in *Management of Mature Trees proceedings of the 4th NAAA Workshop*, Sydney, 2001. Barrell
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- State Environmental Planning Policy (Vegetation in Non-Rural Areas 2017)
- *Warringah Local Environmental Plan 2011*
- *Warringah Development Control Plan 2011*
- <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>

### 14. LIST OF APPENDICES

The following are included in the appendices:

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

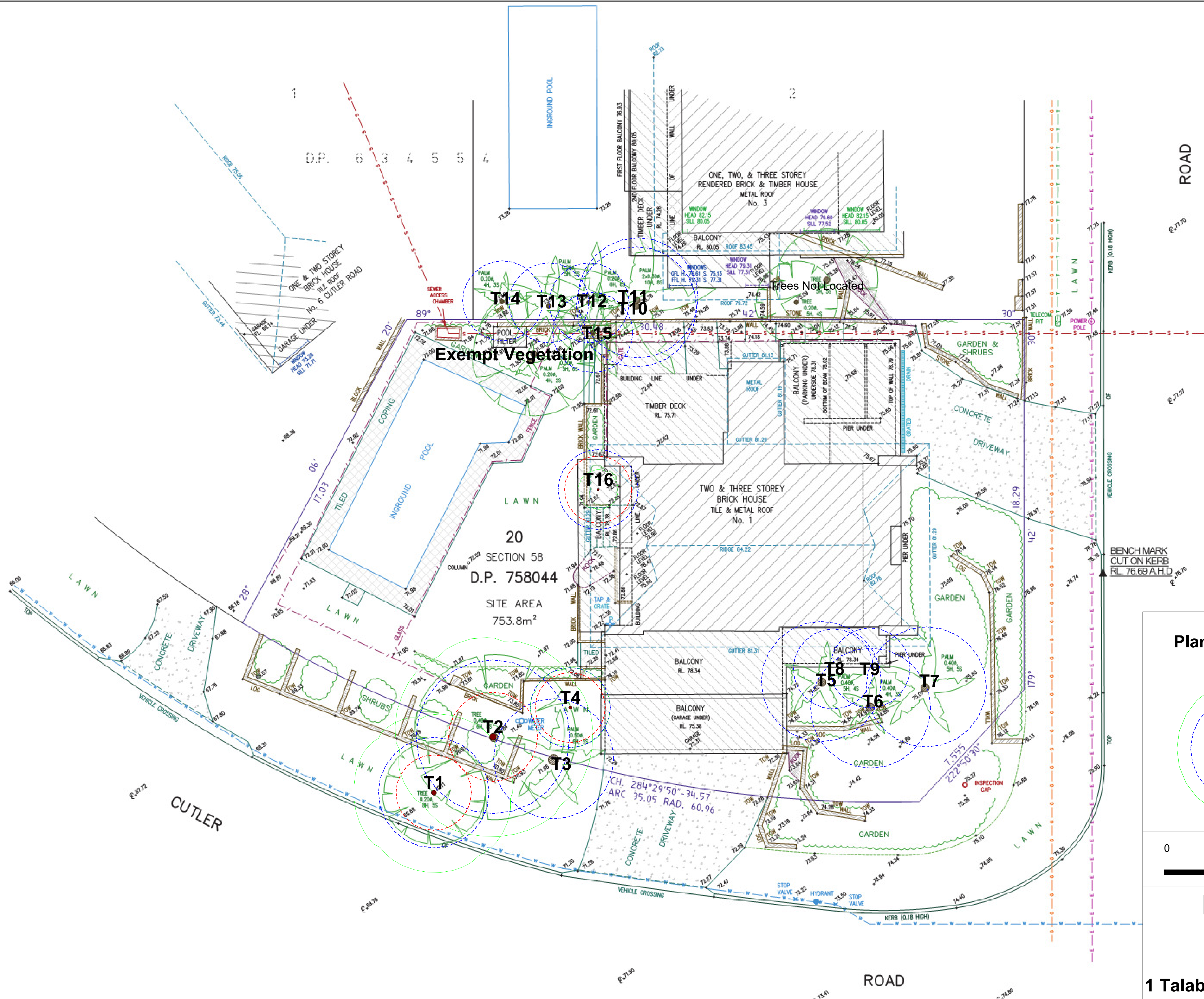
Hugh Millington



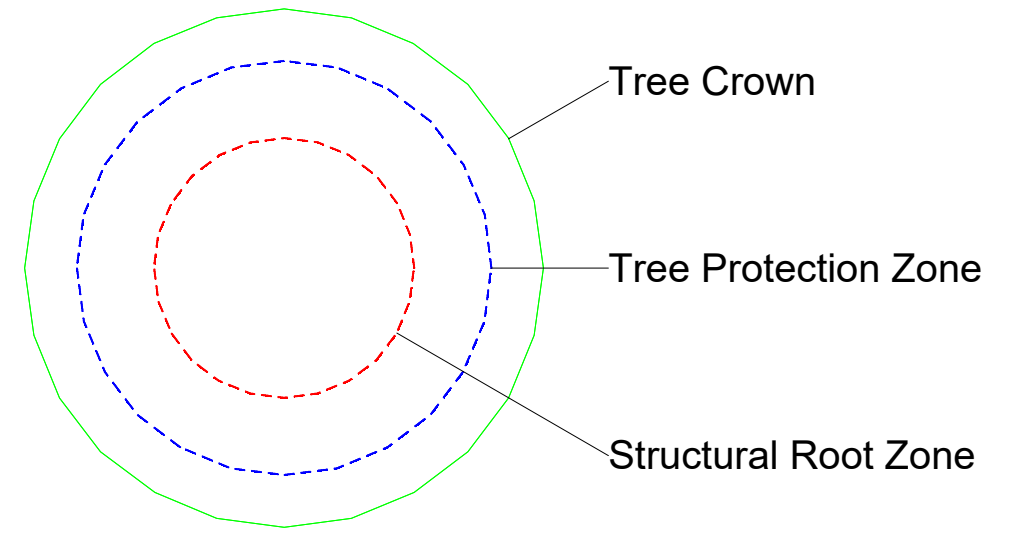
Diploma of Arboriculture (AQF5)  
NC Forestry and Arboriculture III (UK)  
RFS Tech. Cert. II (UK)  
QTRA Registered User  
ISA Tree Risk Assessment Qualification

0426836701

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Plan Legend



Hugh The Arborist

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0426836701

1 Talabum Road, Balgowlah Heights NSW

SCALE : 1 : 100 @ A1 DATE : 15/08/2019

MAP FILENAME : Appendix 1 Existing Site Plan



Prepared for Kevin Mooney and Sanctum Design







# Hugh The Arborist

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1 Tabalum Road, Balgowlah Heights  
NSW

SCALE :  
1 : 100 @ A4

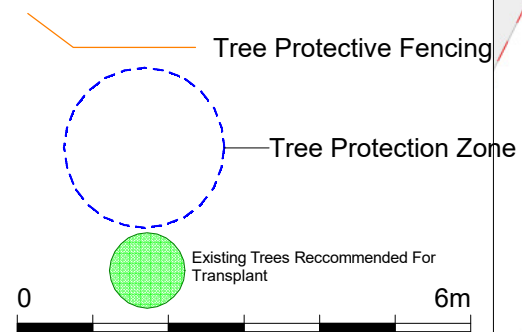
DATE :  
16/08/2019



MAP FILENAME :  
Appendix 1B - Tree Protection Plan

Prepared by Hugh Millington for  
Kevin Mooney and Sanctum Design

## Plan Legend



T14 T13 T12 T11

Exempt Vegetation





## Appendix 2 - Tree Inspection Schedule

Tree ID	Tree Species	Age Class	DBH (MM)	DAB (MM)	Height (M)	Spread (M)	TPZ radius (M)	SRZ radius (M)	Health	Structure	Amenity Value	SULE	Retention Value	Notes/comments
1	<i>Hymenosporum flavum</i> (Native Frangipanni)	M	230	260	7	4	2.8	1.9	Good	Good	High	1.Long	A1	Street Tree.
2	<i>Acmenia smithii</i> (Lilly Pilly)	M	320	390	6	5	3.8	2.2	Fair	Fair	Medium	3.Short	Z4	Apical leader dieback and heavily browsed by animals/insects.
3	<i>Livistona australis</i> (Cabbage Palm)	M	310	-	5	2	3	-	Good	Good	High	1.Long	A1	None.
4	<i>Waterhousia floribunda</i> (Giant Weeping Lilly Pilly)	M	160	220	6	2	2	1.7	Good	Good	High	1.Long	A1	None.
5	<i>Livistona australis</i> (Cabbage Palm)	M	310	-	5	2	3	-	Good	Good	High	1.Long	A1	None.
6	<i>Livistona australis</i> (Cabbage Palm)	M	300	-	4	2	3	-	Good	Good	High	1.Long	Z1	Below height threshold for protection in NBLGA.
7	<i>Livistona australis</i> (Cabbage Palm)	M	310	-	5	2	3	-	Good	Good	High	1.Long	A1	None.
8	Yucca Spp.	M	200	-	6	1	2	-	Good	Good	Low	1.Long	Z3	Species listed as exempt from protection in NBLGA.
9	Yucca Spp.	M	200	-	6	1	2	-	Poor	Fair	Low	3.Short	Z3	Species listed as exempt from protection in NBLGA.
10	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	M	100	-	4	2	3	-	Good	Good	Low	1.Long	Z3	Located on neighbouring property.
11	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	M	150	-	8	2	3	-	Good	Good	Low	1.Long	Z3	Located on neighbouring property.



## Appendix 2 - Tree Inspection Schedule

Tree ID	Tree Species	Age Class	DBH (MM)	DAB (MM)	Height (M)	Spread (M)	TPZ radius (M)	SRZ radius (M)	Health	Structure	Amenity Value	SULE	Retention Value	Notes/comments
12	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	E M	90	-	3	1	2	-	Good	Good	Low	1.Long	Z3	Located on neighbouring property.
13	<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	E M	90	-	3	1	2	-	Good	Good	Low	1.Long	Z3	Located on neighbouring property.
14	<i>Howea forsteriana</i> (Kentia Palm)	M	100	-	4	2	3	-	Good	Good	Low	1.Long	Z3	Located on neighbouring property.
15	<i>Howea forsteriana</i> (Kentia Palm)	M	150	-	5	2	3	-	Good	Good	Low	1.Long	Z3	Species Listed as exempt from protection in NBLGA.
16	<i>Backhousia myrtifolia</i>	M	130	200	5	1	2	1.7	Poor	Fair	Low	3.Short	Z4	Tree is in decline, located in retaining wall planter.

### Explanatory Notes

**Tree Species** - Botanical name followed by common name in brackets. Where species is unknown it is indicated with an '*spp*'.

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

**Diameter at Breast Height (DBH)** - Measured with a DBH tape or estimated at approximately 1.4m above ground level. Where DBH has been estimated it is indicated with an 'Est'. The (1) 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 center of the trunk. Rounded to nearest 0.1m. For monocots, the TPZ is set at 1 meter outside the crown projection.

**Structural Root Zone (SRZ)** -  $(DAB \times 50)^{0.42} \times 0.64$ . Measured in radius from the center 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.

Report on trees at: 1 Tabalum Road, Balgowlah Heights, NSW

Prepared for: Kevin Mooney

Prepared by: Hugh Millington, hugh@hughtheArborist.com.au

Date of survey: 14<sup>th</sup> August 2019

### **Appendix 3 – Condition/Overall health**

<b><u>Category</u></b>	<b><u>Example condition</u></b>	<b><u>Summary</u></b>
Good	<ul style="list-style-type: none"> <li>• Crown has good foliage density for species.</li> <li>• Tree shows no or minimal signs of pathogens that are unlikely to have an effect on the health of the tree.</li> <li>• Tree is displaying good vigour and reactive growth development.</li> <li>• Branch unions appear to be strong with no sign of defects.</li> <li>• There are no significant cavities.</li> <li>• The tree is unlikely to fail in usual conditions.</li> <li>• The tree has a balanced crown shape and form.</li> </ul>	<ul style="list-style-type: none"> <li>• The tree is in above average health and condition and no remedial works are required.</li> <li>• The tree is considered structurally good with well developed form.</li> </ul>
Fair	<ul style="list-style-type: none"> <li>• The tree may be starting to dieback or have over 25% deadwood.</li> <li>• Tree may have slightly reduced crown density or thinning.</li> <li>• There may be some discolouration of foliage.</li> <li>• Average reactive growth development.</li> <li>• There may be early signs of pathogens which may further deteriorate the health of the tree.</li> <li>• There may be epicormic growth indicating increased levels of stress within the tree.</li> <li>• The tree may have minor structural defects within the structure of the crown that could potentially develop into more significant defects.</li> <li>• The tree may a cavity that is currently unlikely to fail but may deteriorate in the future.</li> <li>• The tree is an unbalanced shape or leans significantly.</li> <li>• The tree may have minor damage to its roots.</li> <li>• The root plate may have moved in the past but the tree has now compensated for this.</li> <li>• Branches may be rubbing or crossing.</li> </ul>	<ul style="list-style-type: none"> <li>• The tree is in below average health and condition and may require remedial works to improve the trees health.</li> <li>• The identified defects are unlikely cause major failure.</li> <li>• Some branch failure may occur in usual conditions.</li> <li>• Remedial works can be undertaken to alleviate potential defects.</li> </ul>
Poor	<ul style="list-style-type: none"> <li>• The may be in decline, have extensive dieback or have over 30% deadwood.</li> <li>• The canopy may be sparse or the leaves may be unusually small for species.</li> <li>• Pathogens or pests are having a significant detrimental effect on the tree health.</li> <li>• The tree has significant structural defects.</li> <li>• Branch unions may be poor or weak.</li> <li>• The tree may have a cavity or cavities with excessive levels of decay that could cause catastrophic failure.</li> <li>• The tree may have root damage or is displaying signs of recent movement.</li> </ul>	<ul style="list-style-type: none"> <li>• The tree is displaying low levels of health and removal or remedial works may be required.</li> <li>• The identified defects are likely to cause either partial or whole failure of the tree.</li> </ul>

	<ul style="list-style-type: none"> <li>• The tree crown may have poor weight distribution which could cause failure.</li> </ul>	
Dangerous	<ul style="list-style-type: none"> <li>• The tree is dead or almost dead.</li> <li>• The tree is an imminent danger to people or property.</li> </ul>	<ul style="list-style-type: none"> <li>• The tree should generally be removed.</li> </ul>

## **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.

$$\text{TPZ} = \text{DBH} \times 12$$

Where

DBH = trunk diameter measured at 1.4 m above ground

Radius is measured from the centre of the stem at ground level.

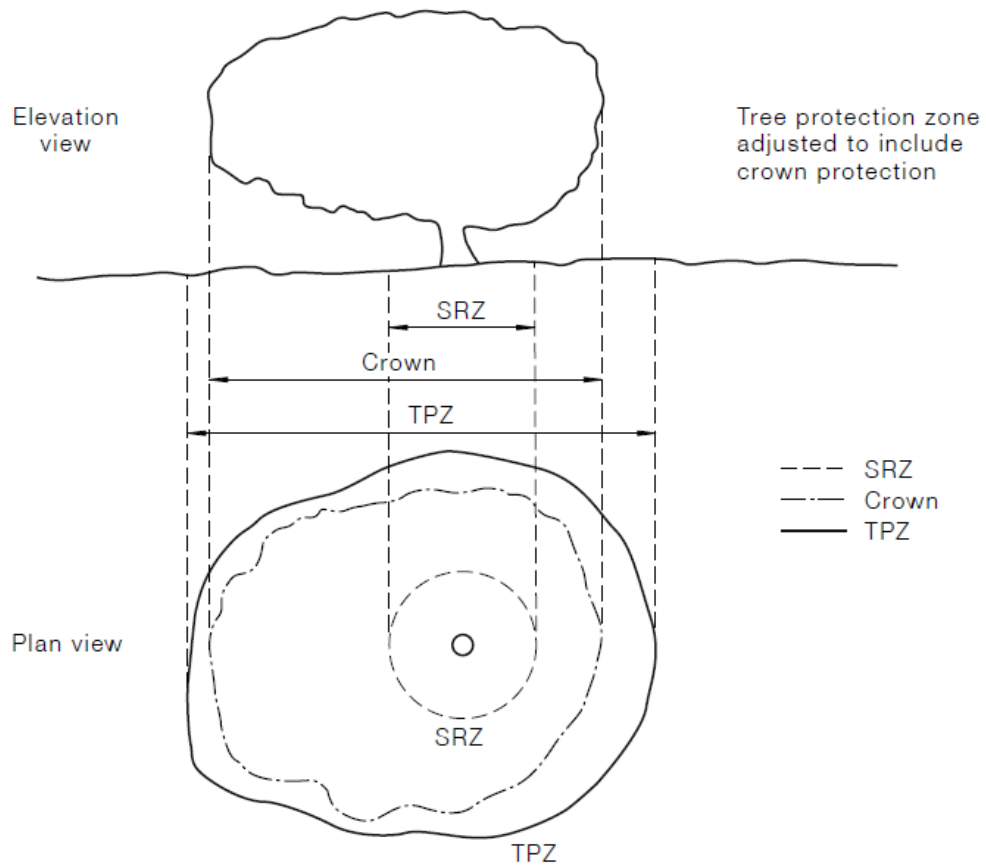
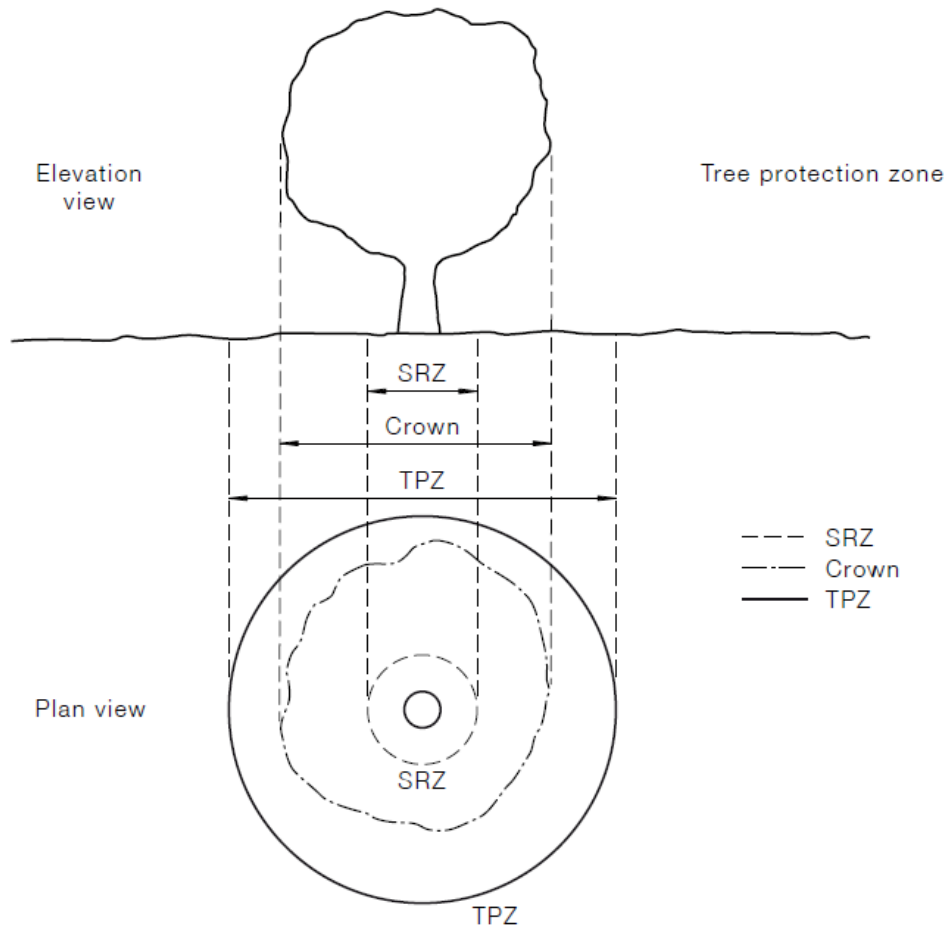
A TPZ should not be less than 2 m nor greater than 15 m (except where crown protection is required).

### **Minor encroachment into the TPZ**

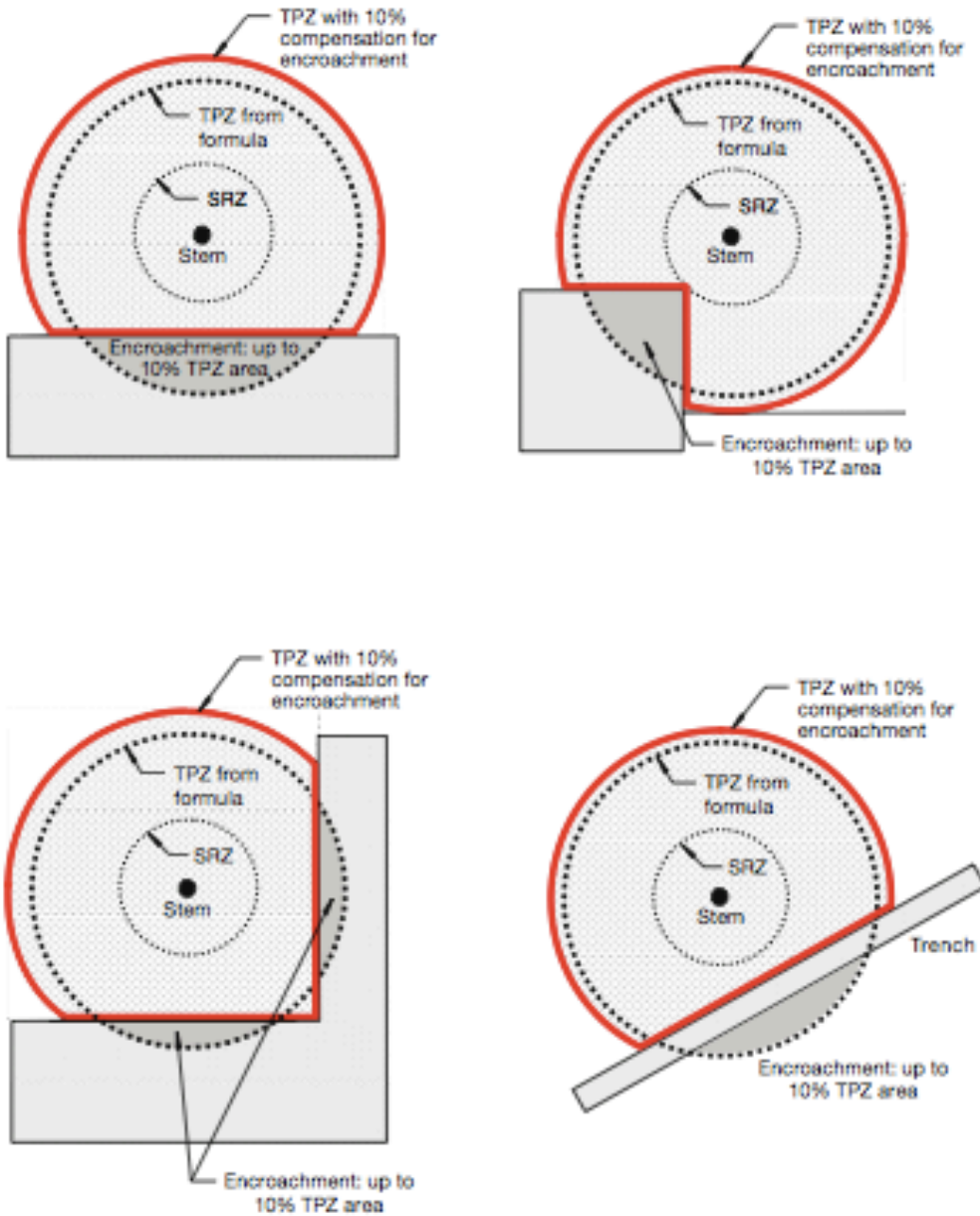
Where encroachment into the TPZ is unavoidable it is generally accepted that encroachment of under 10% of the total TPZ is possible without carrying out detailed root investigations. This minor loss of root area is normally compensated by the roots developing elsewhere.

### **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. Non destructive root investigations may be required to determine any potential impact the encroachment may have on the tree.



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.

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

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 statutory 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.

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

## **Appendix 8 - Structural condition**

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

## **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.

<b>Category</b>	<b>Description</b>
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.
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## 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](http://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

<b>Z1</b>	Young or insignificant small trees, i.e. below the local size threshold for legal protection, etc
<b>Z2</b>	Too close to a building, i.e. exempt from legal protection because of proximity, etc
<b>Z3</b>	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

<b>Z4</b>	Dead, dying, diseased or declining
<b>Z5</b>	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
<b>Z6</b>	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

<b>Z7</b>	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
<b>Z8</b>	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

<b>Z9</b>	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
<b>Z10</b>	Poor condition or location with a low potential for recovery or improvement, i.e. dominated by adjacent trees or buildings, poor architectural framework, etc
<b>Z11</b>	Removal would benefit better adjacent trees, i.e. relieve physical interference, suppression, etc
<b>Z12</b>	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

<b>A1</b>	No significant defects and could be retained with minimal remedial care
<b>A2</b>	Minor defects that could be addressed by remedial care and/or work to adjacent trees
<b>A3</b>	Special significance for historical, cultural, commemorative or rarity reasons that would warrant extraordinary efforts to retain for more than 10 years
<b>A4</b>	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.