Moore Trees
Arboricultural Services

ABN 90887347745

Arboricultural Development Assessment Report

Anglicare, St Lukes
4 Lindsay Evans Place, Dapto NSW 2530
RAC PROJECT
16th July 2019

Prepared for: Anglicare
c/o RJA Projects

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Summary

This report has been compiled for RJA Projects on behalf of Anglicare. The report concerns a proposed Development Application for Anglicare, St Lukes Dapto NSW 2530. This Arborist Report refers to one hundred and fifteen (115) trees.

This report contains the following information required in Wollongong City Council Development guidelines:-

1) All trees were assessed for Safe Useful Life Expectancy (SULE).
2) Genus and species of each tree.
3) Impact of the proposed development on each tree.
4) Impact of retaining tree on the proposed development.
5) The Tree Protection Zone (TPZ) for each tree to be retained.
6) Any branch or root pruning that may be required for trees.
7) List trees within fifteen (15) metres of the site boundary.

Based on the proposed designs require the following trees to be removed being; 103, 104, 105, 106, 107, 108, 109, 110, 204, 205, 208, 209, 210, 226, 227, 228, 229, 230, 237, 238, 239, 240, 241, 242, 243, 246, 247, 250, 342, 352, 355, 356, 357, 359, 376, 377, 378, 379, 380, 385, 386, 387, 388, 389, 390, 391, 393, 395, 396, 397, 398, 400, 403 and 404. Total tree removal and retention numbers can be seen in tabulated format in Appendix 2. Trees to be retained and removed can be seen in the Tree Protection Plan (Appendix 1).

Trees to be retained will require various site specific tree protection measures as specified in Section 5.2 of this report.

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VERSION CONTROL

Date of Issue	Details
16th July 2019	Final

1 INTRODUCTION

1.1 This report has been conducted to assess the health and condition of one hundred and fifteen (115) trees have been assessed for this report however only trees directly adjacent to the RAC building will be affected by the works. An initial Arboricultural Report was undertaken by Hugh Taylor for Asplundh dated 11.10.2017. The numbering of the trees within my report are based on the actual tree numbered tags present at the time of inspection on the 4th June 2019. The individual tree assessments can be seen in Appendix 2. Additional numbered trees are shown on the Tree Protection Plan and Tree Location Plan (Appendix 1) within this report for reference. The subject trees are located at Anglicare St Lukes Village, Dapto (Diagram 1). The study area can be seen in Diagram 2.

The subject trees assessed for this report are not consecutively numbered. The numbering in this report is based on the tags that are currently affixed to the site trees. The tree locations are based on the Dennis Smith Survey Plans 2015. An additional column in Appendix 2 (Tree Health and Condition Schedule) list both numbering systems from the survey and the site tree tags.

The subject trees were assessed for their health and condition. Also included in this report are tree protection measures that will help retain and ensure that the long term health of the trees to be retained are not adversely affected by the proposed development in the future.

As specified in the Wollongong City Council Development Application guidelines the following data was collected for each tree:

1) A site plan locating all trees over three (3) metres in height, including all street trees.
2) All trees were assessed for Safe Useful Life Expectancy (SULE), health and amenity value.
3) Genus and species identification of each tree.
4) Impact of the proposed development on each tree.
5) The Tree Protection Zone (TPZ) for each tree to be retained.
6) Any branch or root pruning that may be required for trees.

Also noted for the purpose of this report were:

- Health and Vigour; using foliage colour and size, extension growth, presence of deadwood, dieback and epicormic growth throughout the tree.

- Structural condition using visible evidence of bulges, cracks, leans and previous pruning.
- The suitability of the tree taking into consideration the proposed development.
- Age rating; Over-mature (>80% life expectancy), Mature (20-80% life expectancy), Young, Sapling (<20% life expectancy).

1.2 Documents and information provided: I have been informed the Independent Living Units (ILU) will be undergoing a renovation of the existing structure.

1.3 Location: The proposed development site is located at 4 Lindsay Evans Place, Dapto NSW 2530. The proposed development site from herein will be referred to as "the Site".

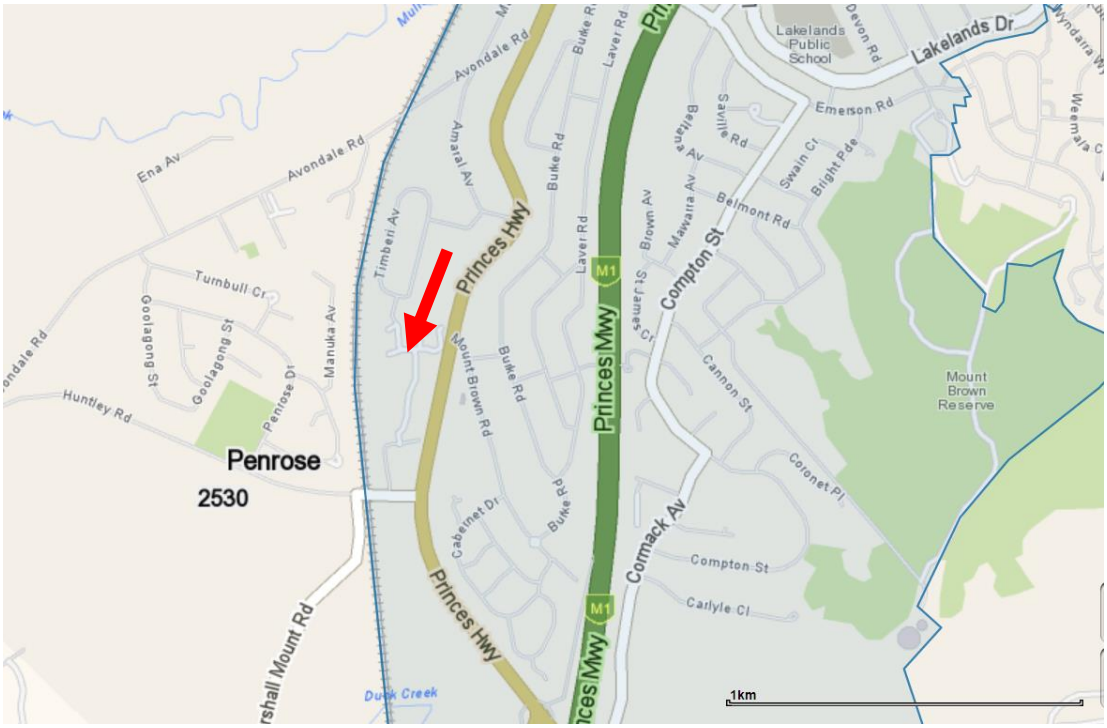


Diagram 1: Location of subject site, Anglicare, St Lukes Dapto (Red arrow) (whereis.com.au, 2019)

Diagram 2: Location of the study area (Google earth 2019)

2 METHODOLOGY

2.1 To record the health and condition of the trees, a Visual Tree Assessment (VTA) was undertaken on the subject trees on 4th June 2019 and the 10th July 2019. This method of tree evaluation is adapted from Matheny and Clark, 1994 and is recognised by The International Society of Arboriculture. Individual tree assessments are listed in Appendix 2 of this report. All inspections were undertaken from the ground. No diagnostic devices were used on these trees.

2.2 This report is only concerned with trees on the site that come under the Tree management permit policy that is part of the Wollongong City Council Development Control Plan, 2009 (Chapter E17 Preservation and management of Trees and vegetation). Under this Chapter (E17), a person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any prescribed tree or other vegetation, without development consent or a permit being granted by Council. Refer to Part 3 (Chapter E17) Definitions for the meaning of 'prescribed tree' and 'prescribed other vegetation'. Two application processes have been established to deal with the assessment and approval for prescribed trees:

a) Tree Management Permit (generally for individual/small scale tree removal and pruning in urban areas) - refer to Council's website for the Tree Management Permit Policy;

b) Development consent via either Complying Development or Development Application. This Chapter of the DCP should be read in conjunction with clauses 5.10 Heritage conservation, 5.11 Bush fire hazard reduction work and 7.2 Natural resource sensitivity – biodiversity of Wollongong Local Environmental Plan 2009.

This Report is required as per clause (b) via a Development Application for the site. This report takes no account of any tree or shrub under three (3) metres in height.

2.3 **Height:** The heights and distances within this report have been measured with a Bosch DLE 50 laser measure.

2.4 Tree Protection Zones (TPZ): The TPZ is the principal 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. TPZ's have been calculated for each tree to determine construction impacts. The TPZ calculation is based on the Australian Standard *Protection of trees on development sites,* AS 4970, 2009.

2.5 Structural Root Zone (SRZ): The SRZ is a specified distance measured from the trunk that is set aside for the protection of tree roots, both structural and fibrous. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. For the purpose of this report the SRZ is within the TPZ so no additional fencing will be required. The TPZ and SRZ are measured as a radial measurement from the trunk. No roots should be severed within this area. A detailed methodology on the TPZ and SRZ calculations can be found in Appendix 4.

2.6 Safe Useful Life Expectancy (SULE): The subject trees were assessed for a Safe Useful Life Expectancy (SULE). The SULE rating for each tree can be seen the Tree Assessment Schedule (Appendix 2). A detailed explanation of SULE can be found in Appendix 3.

2.7 Impact Assessment: An impact assessment was conducted on the site trees. This was conducted by assessing the proposed site plan provided by Merrin & Cranston marked project A220 SD.S.107 dated 23/11/18. Sections 4 and 5 number SD.R. 306 and 307 dated 6.6.19. The plans provided were assessed for the following:

- Reduced Level (R.L.) at base of tree.
- Incursions into the Tree Protection Zone (TPZ).
- Assessment of the likely impact of the works

3 RELEVANT BACKGROUND INFORMATION

3.1 The site is part of the St Lukes Village Anglicare site located between the Illawarra Railway and the Princes Highway just south-west of Dapto. The site contains multi-level buildings surrounded by gardens and court yard areas. The proposed works entail demolition of the existing structure and construction of a new structure.

3.2 **Environmental Significance**: All trees in the Wollongong Local Government Area are protected and cannot be removed without the adequate requirements being met. Specifications relating to what can and cannot be removed are detailed in the Wollongong City Council Development Control Plan (DCP), 2009 in Chapter E17 *'Preservation of trees & management of trees and vegetation'*. This DCP protects all trees above three (3) metres in height with a girth of twenty (20) centimetres or more, measured at a distance of one hundred (100) centimetres above the ground.

As Council is the consent authority regarding the site trees, Council may not agree with the views expressed in this report and condition that certain trees are to be retained. This may entail redesign or minor alterations of the project. In this instance, the Architect or Draftsperson should refer to the TPZ and SRZ measurements to enable adequate distances to be maintained between the tree and any proposed works.

3.3 **OEH Native vegetation Mapping:** The online Native Vegetation Regulatory (NVR) Map was prepared by OEH under Part 5A of the amended *Local Land Services Act 2013* (LLS Act) and supporting regulation.

The Native Vegetation Regulatory Map is a tool to give landholders certainty when planning future management of their land. The Map is a regulatory requirement. Part 5A of the Local Land Services Act 2013 (LLS Act), requires the Chief Executive of the Office of Environment and Heritage (OEH) to prepare and maintain a Native Vegetation Regulatory (NVR) Map.

The NVR Map generally covers rural land in NSW. It categorises land where management of native vegetation can occur without approval or where management of native vegetation may be carried out in accordance with Part 5A of the LLS Act. A summary of categories used in the NVR Map is shown below (Table 1). The site is mapped as *Excluded land.*

Colour	Category	Definition
Blue	**Category 1** Unregulated Land	Rural lands where clearing is not regulated by the Part 5A of the LLS Act. Other legislation may apply.
Yellow	**Category 2** Regulated Land	Rural lands where clearing is regulated and can be carried out in accordance with the Part 5A of the LLS Act or other legislation. This includes complying with the Codes and Allowable activities.
Orange	**Category 2** Vulnerable Regulated Land	Rural land where clearing of native vegetation is more restricted than on other Category 2 land. This includes steep and highly erodible lands and riparian land and special category land (as declared).
Pink	**Category 2** Sensitive Regulated Land	Rural lands where clearing of native vegetation is more restricted than other Category 2 land. This includes lands that are Sensitive Lands due to factors such as the presence of coastal wetlands, littoral rainforests, rainforest, or land that is subject to protection covenants such as conservation or incentive property vegetation plans.
Grey	Excluded Land	Land not regulated by the Part 5A of the LLS Act. This land includes urban zones, environmental conservation zones and R5 large lot residential as gazetted under a Local Environment Plan (LEP). It also includes public conservation lands such as National Parks and State Forests.

Table 1: Categories used in the NVR Map (OEH 2018)

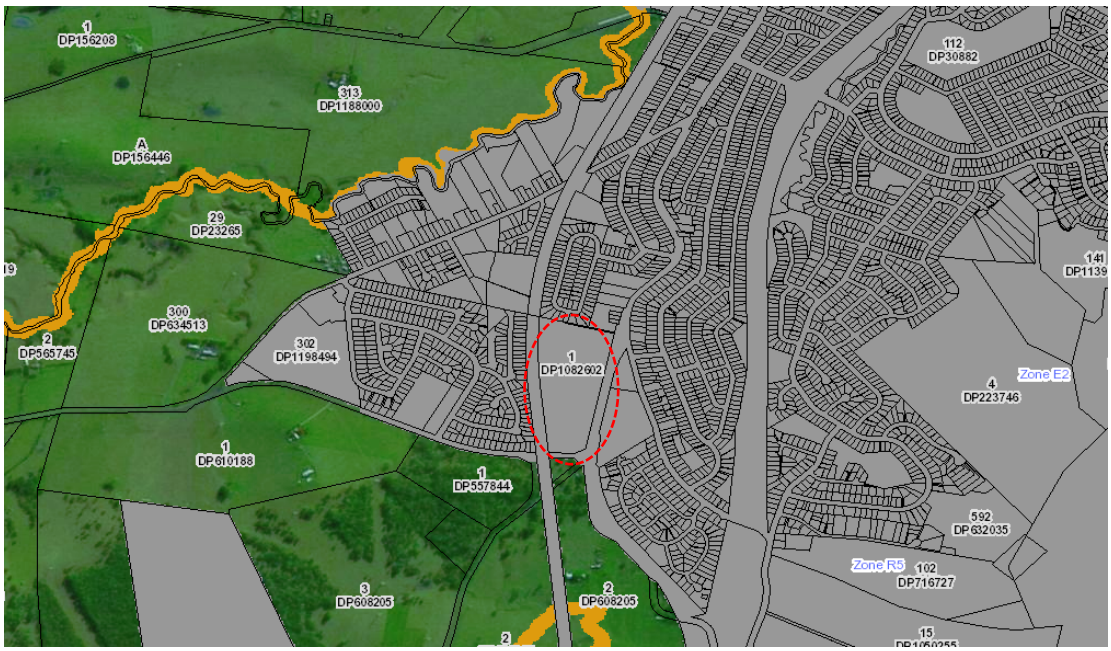


Diagram 3: Native Vegetation Regulatory Map showing the site and surrounding areas (OEH 2018)

3.4 **The Site Trees:** The site was inspected on 4th June 2019 and 10th July 2019. Each tree has been given a unique number for this site and can be viewed on the Tree Protection Plan (Appendix 1). This plan is based on the plan provided by Nicholas Bray Landscape Architects. All site trees have been tagged to correspond with the Tree Protection Plan tree numbers. The subject trees assessed for this report are not consecutively numbered. The numbering in this report is based on the tags that are currently affixed to the site trees. The tree locations are based on the Dennis Smith Survey Plans 2015. An additional column in Appendix 2 (Tree Health and Condition Schedule) list both numbering systems from the survey and the site tree tags

3.5 The site trees are mostly native specimens being Forest red gum *(Eucalyptus tereticornis), Melaleuca styphelioides,* White stringy bark *(Eucalyptus globoidia),* Swamp mahogany *(Eucalyptus robusta),* River she oak *(Casuarina cunninghamiana),* Brushbox *(Lophostemon confertus).* Exotic specimens consist of Olive *(Olea europaea),* Cocos palm *(Syagrus romanzoffiana),* Chinese elm *(Ulmus parvifolia)* and *Cupresses sp.*

3.6 Safe Useful Life Expectancy (SULE) is a method of evaluating individual trees. The evaluation is a subjective assessment, not an absolute judgement, because the nature of trees and opinions on trees can vary greatly. SULE assessments are made only by those who are experienced and knowledgeable in tree management. SULE is generally accepted and used world-wide as a method of evaluating trees. Each category has a number of sub-categories. These sub-categories should always be recorded to help future users of the information appreciate the reason for each allocation decision. It is normal to have instances where trees will not fit neatly into a single SULE category. The assessment of the site trees can be seen in Graph 1. In general, the trees were mostly assessed as being in good health. SULE results show that 70% of the site's tree population has a life expectancy of greater than forty (40) years and 17% had a medium life expectancy. Trees that have a short life expectancy total 8%.

3.7 **Potential habitat:** For the purpose of this report, WCC defines a "Habitat tree" as follows; *Habitat tree means any tree which is a nectar feeding tree, roost and nest tree or a hollow-bearing tree which is suitable for nesting birds, arboreal marsupials (possums), micro-bats or which support the growth of locally indigenous epiphytic plants such as orchids.* (DCP, 2009, Chapter E17 *'Preservation of trees & management of trees and vegetation').*

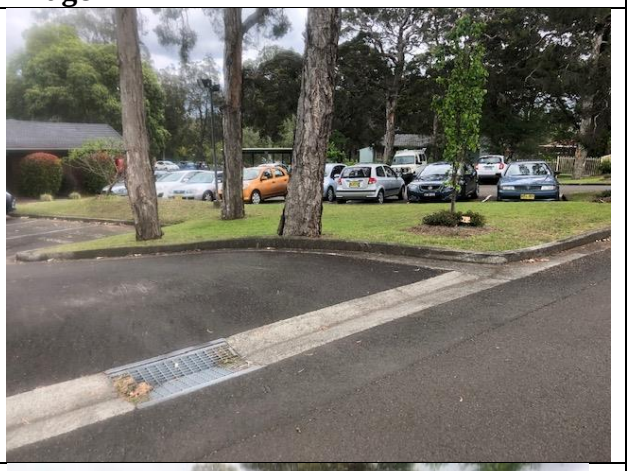
None of the site trees to be removed were assessed as having hollows.

3.8 Several trees have incursions to the TPZ areas. These have been detailed in Table 1. Provided the following recommendations in this report are implemented, it should be possible to retain these trees, with minor impacts to their health and condition.

Table 1

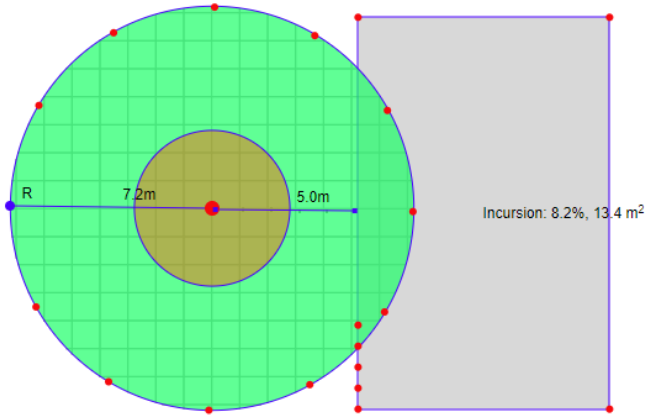
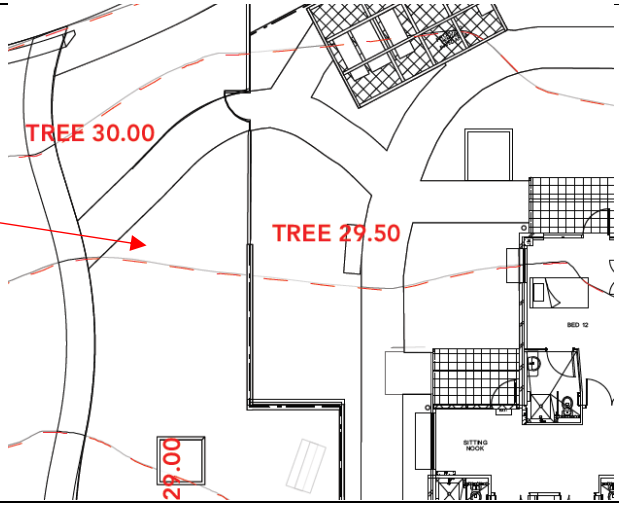
Tree No.	Anticipated Impacts	Image
351, 352, 354, 355, 356	Between Trees 352 and 354 (Red line) a distance of 4.8 metres is currently used. This existing trail could be used for the fire trail.	
Tree 248	Existing concrete foot paths can be removed with care. New footpaths can be installed with minimal impacts. Minor incursions from new retaining wall (See Table 2).	

Tree No.	Anticipated Impacts	Image
Tree 249	Tree 249 has a low retaining wall near it however this is to enable the gradient to increase to the west. It will be important that soil does not build up around the trunk due to the level changes required. Existing concrete foot paths can be removed with care. New footpaths can be installed with minimal impacts.	
Tree 101	Tree 101 requires no level changes within the TPZ area. Existing concrete foot paths can be removed with care. New footpaths can be installed with minimal impacts. No subsurface drains shall breach the TPZ of this tree, being six (6) metres. See Table 2 for impacts.	
Tree 102	Tree 102 has been recommended to be retained by Council and will require tree protection measures to be implemented prior to works occuring.	

Tree No.	Anticipated Impacts	Image
	Image showing the hard surfaces below Tree 102.	
Tree 361 and 362	The Tree 362 and 362 (red arrow) will be retained.	
Tree 385	Tree 385 that has been nominated for removal to allow for the Rain garden area.	

Tree No.	Anticipated Impacts	Image
Tree 385	Stem wound on Tree 385	
Tree 381	This species is considered a weed species of palm however this group is currently proposed to be retained.	

Table 2: Impacts to TPZ incursion assessment of Trees 101, 248, 249 and 355

Tree #	TPZ SRZ	Issue	% breach of TPZ	Recommendations
101	TPZ: 7.2m SRZ: 2.8m	Incursion of 8.2% of TPZ due to structure.		Incursion less than 10% So considered minimal Based on AS 4970
248	TPZ: 7.2m SRZ: 2.8m	Incursion of TPZ due to level changes. Tree 248 has RL of 29.50. Retaining wall near this tree tapers to ground level.		RL at base of tree 248 almost at level of the nearest courtyard. See Diagram 1. Provided soil/fill is not mounded against the trunk the tree will tolerate this level increase within the TPZ. Fill over the TPZ to be free draining and not compacted.

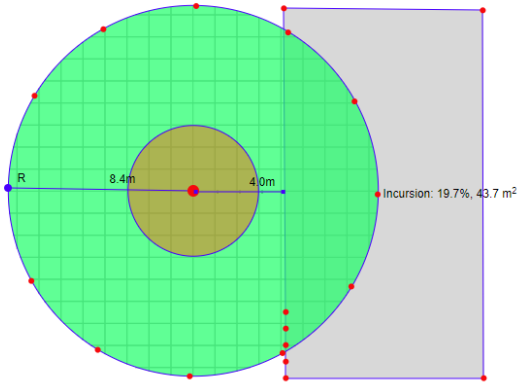
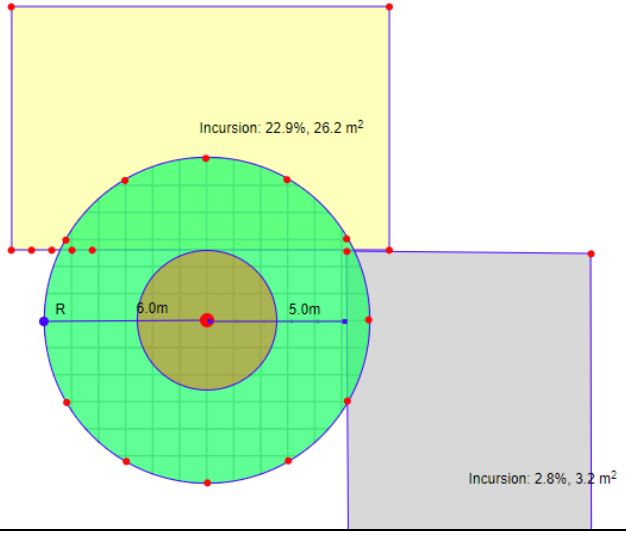
249	TPZ: 8.4m SRZ: 2.9m	Incursion of TPZ due to level changes. Tree 249 has RL of 29. Retaining wall near this tree will be block work. Incursion of 19.7% to TPZ due to wall footing.		Footing across the TPZ of Tree 249 to be pier and beam construction. See Diagram 1. Beam to be ABOVE grade. No soil level changes at base of Tree 249.
355	TPZ: 6m SRZ: 2.6m	Total incursion of TPZ is 25.7%. This is a large incursion however landscaping at the base of the tree by way of lawn removal and providing a mulched garden area with regular watering will help the tree cope with these construction impacts. The blue incursion is a paved courtyard so excavations will be minimal in this area of the TPZ.		Area to me mulched as part of the tree protection zone. See Diagram 2. Regular watering to occur once construction commences.

Diagram 1: Portion of Merrin & Cranston Architects Section near Trees 248 and 249.

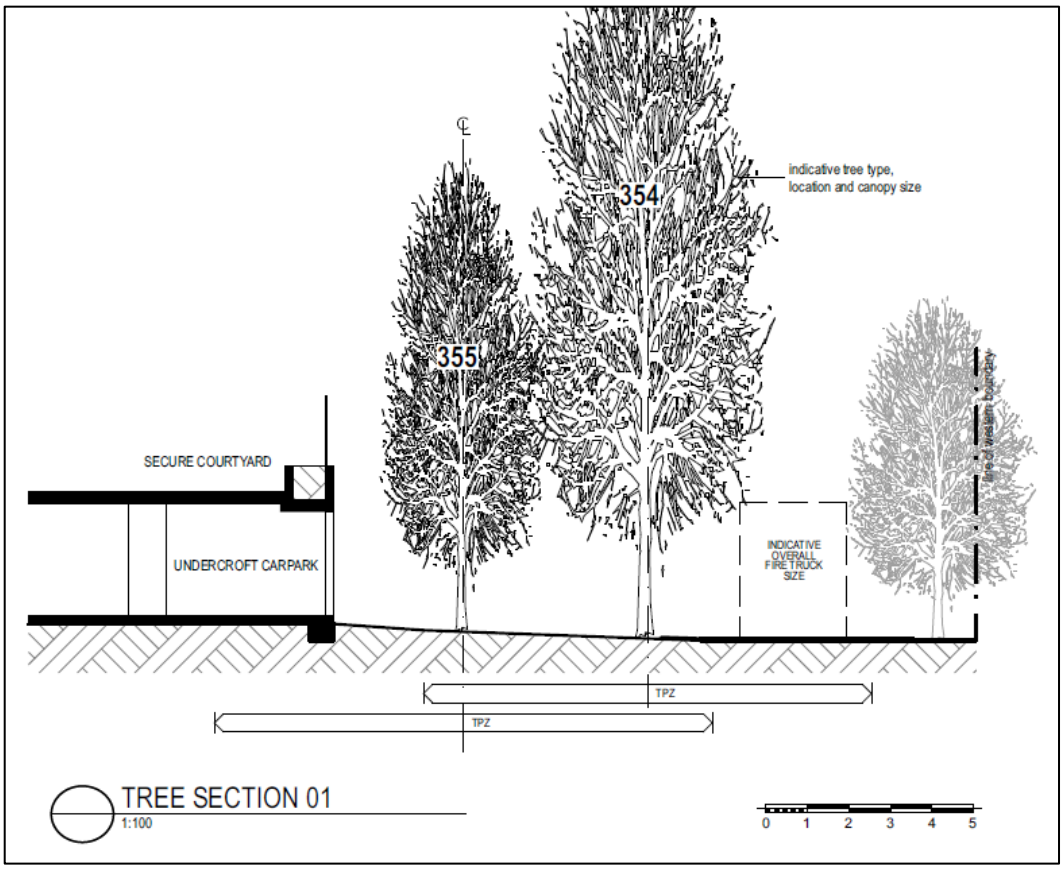


Diagram 2: Portion of Merrin & Cranston Architects Section near Trees 248 and 249.

3.9 Impacts: Trees numbered as 103, 104, 105, 106, 107, 108, 109, 110, 204, 205, 208, 209, 210, 226, 227, 228, 229, 230, 237, 238, 239, 240, 241, 242, 243, 246, 247, 250, 342, 352, 355, 356, 357, 359, 376, 377, 378, 379, 380, 385, 386, 387, 388, 389, 390, 391, 393, 395, 396, 397, 398, 400, 403 and 404 are required to be removed for the purpose of the development. All other trees are to be retained.

4 RECOMMENDATIONS

4.1 A Project Arborist should be appointed to oversee the arboricultural related works for the project. The Project Arborist should be used for arboricultural certification services and also used as a point of contact should any questions arise during the project. As specified in AS 4970, 2009, a Project Arborist is a person with a minimum Australian Qualification Framework (AQF) level 5 Diploma of Arboriculture or Horticulture qualification.

4.2 Based on the proposed designs require the following trees to be removed being; 103, 104, 105, 106, 107, 108, 109, 110, 204, 205, 208, 209, 210, 226, 227, 228, 229, 230, 237, 238, 239, 240, 241, 242, 243, 246, 247, 250, 342, 352, 355, 356, 357, 359, 376, 377, 378, 379, 380, 385, 386, 387, 388, 389, 390, 391, 393, 395, 396, 397, 398, 400, 403 and 404. Total tree removal and retention numbers can be seen in tabulated format in Appendix 2. Trees to be retained and removed can be seen in the Tree Protection Plan (Appendix 1).

4.3 Removal of hard surfaces below Trees 101 and 102 shall be undertaken with a flat bucket excavator, with surfaces removed pulling away from the trees. A spotter should be used to ensure that the bucket attachment does not contact the main stem and damage the trunks. Trees 101 and 102 have a stormwater pipe located within the respective TPZ distance. It is recommended that this pipe be left in place, if possible. In terms of design there should be no level increases within the TPZ distances of this tree that require strip footings. A retaining wall could be built across the TPZ of Tree 101 and 341, provided the existing grade could be bridged via the use of pier and beam type construction or the wall altered around the base of the tree as seen in Image 1 below.

Image 1: Image showing a design concept that allows an increase in levels over the TPZ that may have to be implemented for Tree 101 and Tree 341.

4.4 Removal of hard surfaces below Trees 248, 249 shall be undertaken with a flat bucket excavator, with surfaces removed pulling away from the trees. A spotter should be used to ensure that the bucket attachment does not contact the main stem and damage the trunks. The proposed retaining wall near Tree 248 will increase soil levels up to one (1) metre around this tree. Ideally a retaining wall could be installed so as to keep the trunk clear of soil. This type of design should not be closer than two (2) metres to the main stem. Strip footings to be avoided vis the use of pier and beam type construction with the beam above grade.

4.5 Removal of hard surfaces below Trees 248, 249 shall be undertaken with a flat bucket excavator, with surfaces removed pulling away from the trees. A spotter should be used to ensure that the bucket attachment does not contact the main stem and damage the trunks. The proposed retaining wall near Tree 248 will increase soil levels up to one (1) metre around this tree. Ideally a retaining wall could be installed so as to keep the trunk clear of soil. This type of design should not be closer than two (2) metres to the main stem. Strip footings to be avoided vis the use of pier and beam type construction with the beam above grade.

4.6 The proposed new fire trail running along the western side of the proposed development will impact on trees 351-354. Tree 352 could be removed, this would allow a distance of 5.2 metres between Tree 353 and 354.

4.7 Tree group 381 are a group of five (5) Cocos palms planted around a substation. Potentially these trees could be relocated however they are listed as a weed species and could be replaced with an indigenous species of palm such as Bangalow or Cabbage tree palm. At present they are proposed to be retained near the rain garden.

4.8 Tree 248: RL at base of tree 248 almost at level of the nearest courtyard. Provided soil/fill is not mounded against the trunk the tree will tolerate this level increase within the TPZ. Fill over the TPZ to be free draining and not compacted.

4.9 Tree 249: Footing across the TPZ of Tree 249 to be pier and beam construction. Beam to be ABOVE grade. No soil level changes at base of Tree 249.

4.10 Tree 355: Area to me mulched as part of the tree protection zone. Regular watering to occur once construction commences. Mulch to extend to the fencing area.

4.11 Prior to the commencing of demolition and construction all trees are to be tagged with numbered tags so that these numbers correspond with the trees numbered on the plans. This shall be undertaken by the project arborist.

4.12 No services shall be trenched through the SRZ distances of any tree to be retained.

4.13 Pruning of the Council street tree numbered as Tree 1 near the site entry from Lindsay Place is required. The eastern portion of the canopy of Tree 1 requires reduction pruning as the broad spreading canopy will be damaged by trucks entering and leaving the site. These branches should be reduced back so as to maintain the canopy of the tree (ie, no lopping or 'flat topping'). Pruning points should be no greater than 100mm in diameter. This pruning is known as selective pruning and can be read about in more detail in the Australian Standard for the Pruning of Amenity Trees (AS 4373) 2007. Council may choose to undertake this pruning themselves.

4.14 A tabulated list of trees to be retained and removed is located in Appendix 2.

4.15 Trees to be retained will require tree protection fencing as specified in Section 5.2 of this report. This fencing will be located at the Tree Protection Zones (TPZ) listed in the Tree Schedule (Appendix 2). The specifications for a TPZ are in Section 5.3 of this report.

4.16 Site access is presumed to be from Timberi Avenue. All other site trees have clear access with no overhanging limbs that will impede the site access.

5 TREE PROTECTION

5.1 Trees to be protected: Trees to be retained will be required to be fenced for protection. All fencing shall be installed as specified in Section 5.5 (Tree Protection – Implementation of Tree Protection Zone). Indicative locations of the fencing are shown in the Tree Protection Plan (Appendix 1).

5.2 Implementation of Tree Protection Zone: All tree protection works should be carried out before the start of demolition or building work. It is recommended that chain mesh fencing with a minimum height of 1.8 metres be erected as shown in the Tree Protection Plan (Appendix 1).

5.3 Individual trunk protection: Trees 101, 102, 248 and 249 will require trunk protection. This is achieved by attaching lengths of timber (75mm x 50mm x 2000mm) fastened around the trunk. Geotextile fabric or carpet underlay shall be wrapped around the trunk prior to the timbers being attached. These timbers are to be fastened with hoop iron strapping and not attached directly into the bark of the tree. These timbers are only to be removed when all construction is complete.

5.4 Instructional videos: Alternatively, you can view the Moore Trees' short instructional films on the links below. These films are a quick onsite reference for builders, project managers and architects.

Film #1, Trunk Protection
https://www.youtube.com/watch?v=ehcFre6bp74
Film #2, Tree Protection Fencing
https://www.youtube.com/watch?v=ffMabxLN9nU
Film #3, TPZ Ground Protection
https://www.youtube.com/watch?v=Se-VlLi-AGQ

5.5 **The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ):** The TPZ is implemented to ensure the protection of the trunk and branches of the subject tree. The TPZ is based on the Diameter at Breast Height (DBH) of the tree. The SRZ is also a radial measurement from the trunk used to protect and restrict damage to the roots of the tree.

5.6 The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) have been measured from the centre of the trunk. TPZ and SRZ distances are all listed in the Tree Schedule (Appendix 2). The following activities shall be avoided within the TPZ and SRZ of the trees to be retained;

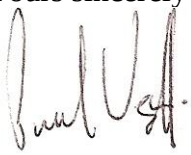
- Erecting site sheds or portable toilets.
- Trenching, ripping or cultivation of soil (with the exception of approved foundations and underground services).
- Soil level changes or fill material (pier and beam or suspended slab construction are acceptable).
- Storage of building materials.
- Disposal of waste materials, solid or liquid.

5.7 **Tree Damage:** If the retained trees are damaged a qualified Arborist should be contacted as soon as possible. The Arborist will recommend remedial action so as to reduce any long term adverse effect on the tree's health.

5.8 **Root Zone Protection:** Ply sheeting or similar ground protection should be placed over the root zone areas shown in the Tree Protection Plan to reduce compaction over the root zone whilst works are occurring. It is likely that the existing fire trail will be used for construction purposes. Alternatively, where Council approves access across a TPZ mulch shall be placed on the access way for the duration of the construction period to a depth of three hundred and fifty (350) millimetres. This mulch is to help reduce soil compaction and retain moisture. Once construction is complete this mulch is to be reduced to a depth

of no deeper than seventy five (75) millimetres or be replaced with the finish specified for the fire trail.

Yours sincerely



Paul Vezgoff
Consulting Arborist
Dip Arb (Dist), Arb III, Hort cert, AA, ISA

16th July 2019

www.mooretrees.com.au

6 IMAGES

Plate 1: Entry to the site showing Tree 1 to the right that will require canopy reduction pruning. P. Vezgoff.

Plate 2: Internal court yard areas containing mostly exotics. P. Vezgoff.

Plate 3:.Trees to the North of the existing structure (246, 247, 205, 403, 404). P. Vezgoff.

Plate 4: Trees 388-398. P. Vezgoff.

Appendix 1

Tree Location Plan 1

Tree Protection Plan 2

DETAILED AREA AROUND THE PROPOSED
RAC - SCALE 1:300

Tree Locations RAC
Plan 1

Moore Trees

LEGEND

- Trees to be removed
- Trees to be retained
- Tree Protection Zone

Black tree numbers denote tree tag number.
Blue number is the number on the Dennis Smith Survey

Date:	16.07.19
Drawn:	P.Vezgoff
Site Address:	St Lukes Dapto RAC Project Dapto NSW

Tree protection plan

Plan 2

Moore Trees

LEGEND

Trees to be removed

Trees to be retained

Tree Protection Zone

Ground Protection. Ply sheeting or course gravel to be placed over the root zone to the extent of the drip line. Protection to remain until all construction works are completed.

Fence. Implementation of tree protection zone (TPZ). All tree protection works should be carried out before the start of demolition or building works. It is recommended that chain mesh fencing with a minimum height of 1.8 metres be errected

Trunk protection. Lengths of timber (75mm x 50mm x 2000) shall be fastened to the trunk or overhead branches that are greater than 80mm in diameter. These timbers are to be fastened with hoop iron strapping and not fixed directly onto the trunk of the tree.

Location of possible root pruning. This area is to be excavated by hand to a depth of 400mm to expose any roots. If roots under 50mm are encountered they can be severed cleanly with a sharp saw. If roots over 50mm are encountered then a qualified arborist should be consulted for further advice.

Black tree numbers denote tree tag number.
Blue number is the number on the Dennis Smith Survey

Date:	16.7.19
Drawn:	P.Vezgoff
Site Address:	St Lukes Dapto RAC Project Dapto NSW

Appendix 2

Tree health & condition assessment schedule

TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE – St Lukes Village Anglicare, RAC, Dapto

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
NA	1	Jacaranda (Jacaranda mimosifolia)	13	6	0.35	95	No visual defects	1a >40 years	Good	Mature	Council Tree at gate entrance	4.2	2.3	Retain
363	101	Melaleuca decora	14	5	0.6	95	No visual defects	1a >40 years	Good	Mature	Remnant	6	2.8	Retain
365	102	Melaleuca decora	14	5	0.6	95	No visual defects	1a >40 years	Good	Mature	Remnant	6	2.8	Retain
366	103	Melaleuca decora	13	5	0.35	95	No visual defects	1a >40 years	Good	Mature		4.2	2.3	Remove
364	104	Melaleuca decora	16	5	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Remove
367	105	Lemon-scented gum tree (Corymbia citriodora)	19	9	0.45	95	No visual defects	1a >40 years	Good	Mature		5.4	2.5	Remove
368	106	Lemon-scented gum tree (Corymbia citriodora)	17	9	0.35	95	No visual defects	1a >40 years	Good	Mature		4.2	2.3	Remove
373	107	Robinia (Robinia pseudoacaia)	3	2	0.2	80	Lopped	2c removed for more suitable planting	Poor	Mature		4.2	2.3	Remove
374	108	Robinia (Robinia pseudoacaia)	3	2	0.2	80	Lopped	2c removed for more suitable planting	Poor	Mature		4.2	2.3	Remove
375-381	109	Cocos palm (Syagrus romanzoffiana)	7	3	0.3	95	No visual defects	2c removed for more suitable planting	Good	Mature	Weed species	2	2	Remove
375-381	110	Cocos palm (Syagrus romanzoffiana)	7	3	0.3	95	No visual defects	2c removed for more suitable planting	Good	Mature	Weed species	2	2	Remove
NA	176	Japanese maple (Acer palmatum)	5	5	0.4	100	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
370	177	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
369	178	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
362	180	Melaleuca decora	18	7	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Retain
360	182	Broad leaved paperbark (Melaleuca quinquenervia)	11	4	0.3	95	No visual defects	1a >40 years	Good	Mature	Multi stemmed specimen	3.6	2.2	Retain

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
359	183	Broad leaved paperbark (Melaleuca quinquenervia)	11	3.5	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
358	184	Broad leaved paperbark (Melaleuca quinquenervia)	11	3.5	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
357	185	Melaleuca decora	16	5	0.6	95	No visual defects	1a >40 years	Good	Mature		7.2	2.8	Retain
355	186	Brushbox (Lophostemon confertus)	9	5	0.35	100	No visual defects	1a >40 years	Good	Mature		4.2	2.3	Retain
354	187	Brushbox (Lophostemon confertus)	9	5	0.35	100	No visual defects	1a >40 years	Good	Mature		4.2	2.3	Retain
22	201	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
34	202	Melaleuca decora	16	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
35	203	River she oak (Casuarina cunninghamiana)	16	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
52	204	Melaleuca decora	17	8	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Remove
NA	205	Olive (Olea europaea)	4.5	2	0.12	95	No visual defects	2c removed for more suitable planting	Good	Mature		1.4	1.6	Remove
38	206	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
39	207	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
41	208	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Remove
43	209	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Remove
44	210	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Remove
18	211	River she oak (Casuarina cunninghamiana)	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
19	212	Melaleuca decora	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
20	213	Melaleuca decora	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
21	214	River she oak (Casuarina cunninghamiana)	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
23	215	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
33	217	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
32	218	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
37	219	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
36	220	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
12	221	Melaleuca decora	6	2	0.2	100	No visual defects	2c removed for more suitable planting	Fair	Mature		2.4	1.9	Retain
9	223	River she oak (Casuarina cunninghamiana)	8	2	0.2	95	No visual defects	2c removed for more suitable planting	Poor	Mature		2.4	1.9	Retain
16	224	River she oak (Casuarina cunninghamiana)	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
17	225	Melaleuca decora	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
45	226	Melaleuca decora	11	3	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Remove
NA	227	Cupresses sp.	8	0.5	0.06	100	No visual defects	2c removed for more suitable planting	Good	Mature		0.7	1.2	Remove
NA	228	Cupresses sp.	8	0.5	0.06	100	No visual defects	2c removed for more suitable planting	Good	Mature		0.7	1.2	Remove
NA	229	Cupresses sp.	8	0.5	0.06	100	No visual defects	2c removed for more suitable planting	Good	Mature		0.7	1.2	Remove
42	230	White cedar (Melia azedarach)	8	3	0.25	80	No visual defects	2c removed for more suitable planting	Good	Mature		3	2.1	Remove
56	231	Melaleuca decora	17	8	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Retain
15	233	River she oak (Casuarina cunninghamiana)	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
14	234	River she oak (Casuarina cunninghamiana)	8	2	0.2	95	No visual defects	2c removed for more suitable planting	Poor	Mature		2.4	1.9	Retain
13	235	River she oak (Casuarina cunninghamiana)	17	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
NA	237	Cupresses sp.	8	0.5	0.15	100	No visual defects	2c removed for more suitable planting	Good	Mature		1.8	1.8	Remove
NA	238	Cupresses sp.	8	0.5	0.15	100	No visual defects	2c removed for more suitable planting	Good	Mature		1.8	1.8	Remove
NA	239	Cupresses sp.	8	0.5	0.15	100	No visual defects	2c removed for more suitable planting	Good	Mature		1.8	1.8	Remove
NA	240	Cupresses sp.	8	0.5	0.06	100	No visual defects	2c removed for more suitable planting	Good	Mature		0.7	1.2	Remove
55	241	River she oak (Casuarina cunninghamiana)	16	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Remove
53	242	Melaleuca decora	12	5	0.45	95	No visual defects	1a >40 years	Good	Mature		5.4	2.5	Remove
54	243	Melaleuca decora	12	5	0.45	95	No visual defects	1a >40 years	Good	Mature		5.4	2.5	Remove
58	244	Melaleuca decora	17	8	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Retain
57	245	Forest red gum (Eucalyptus tereticornis)	18	7	0.6	95	No visual defects	2a May only live for 15-40 years	Fair	Mature		7.2	2.8	Retain
NA	246	Chinese elm (Ulmus parvifolia)	5	3	0.15	92	No visual defects	2c removed for more suitable planting	Good	Mature		1.8	1.8	Remove
51	247	Melaleuca decora	17	8	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Remove
50	248	Melaleuca decora	14	4	0.6	95	No visual defects	1a >40 years	Good	Mature	Remnant	6	2.8	Retain
46	249	Melaleuca decora	16	4	0.7	95	No visual defects	1a >40 years	Good	Mature	Remnant	7	2.9	Retain
49	250	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Remove
47	341	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Retain
48	342	Melaleuca decora	16	5	0.4	95	No visual defects	1a >40 years	Good	Mature		4.8	2.4	Remove

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
83	351	Forest red gum (Eucalyptus tereticornis)	11	5	0.4	80	No visual defects	2a May only live for 15-40 years	Good	Mature		4.8	2.4	Retain
81	352	Melaleuca styphelioides	11	4	0.6	95	No visual defects	1a >40 years	Good	Mature		7.2	2.8	Remove
80	353	Melaleuca decora	8	4	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Retain
82	354	Forest red gum (Eucalyptus tereticornis)	17	6	0.45	90	Dead wood <50mm	2a May only live for 15-40 years	Fair	Mature	4.8m to tree352	5.4	2.5	Retain
85	355	Melaleuca decora	11	4	0.5	95	No visual defects	1a >40 years	Good	Mature	Fill over TPZ. Could be removed	6	2.6	Remove
63	356	River she oak (Casuarina cunninghamiana)	12	4.5	0.35	90	No visual defects	1a >40 years	Fair	Mature		4.2	2.3	Remove
64	357	River she oak (Casuarina cunninghamiana)	12	4.5	0.35	90	No visual defects	1a >40 years	Fair	Mature		4.2	2.3	Remove
61	358	River she oak (Casuarina cunninghamiana)	12	4.5	0.25	90	No visual defects	1a >40 years	Fair	Mature		3	2.1	Retain
62	359	Melaleuca styphelioides	9	4	0.5	98	Stem wounds	1a >40 years	Good	Mature		6	2.6	Remove
60	360	Yukka	4	2	0.2	100	No visual defects	2c removed for more suitable planting	Good	Mature		2.4	1.6	Retain
91	361	Sydney blue gum (Eucalyptus saligna)	17	7	0.9	95	No visual defects	1a >40 years	Good	Mature		10.8	3.3	Retain
89	362	Swamp mahogany (Eucalyptus robusta)	13	4.5	0.3	90	No visual defects	2c removed for more suitable planting	Fair	Mature	Multi stemmed specimen	3.6	2.2	Retain
86	363	Melaleuca decora	8	3.7	0.5	95	No visual defects	1a >40 years	Good	Mature	Fill over TPZ. Could be removed	6	2.6	Retain

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
87	364	River she oak (Casuarina cunninghamiana)	7	2.5	0.25	95	No visual defects	1a >40 years	Fair	Mature		3	2.1	Retain
84	365	Forest red gum (Eucalyptus tereticornis)	17	7	0.45	80	Dead wood >50mm	2a May only live for 15-40 years	Fair	Mature	Borer damage at base. Mech damage	5.4	2.5	Retain
NA	366	Jacaranda (Jacaranda mimosifolia)	7	1.5	0.1	95	No visual defects	2c removed for more suitable planting	Good	Sapling	Multi stemmed specimen	1.2	1.2	Retain
79	369	Swamp she oak (Casuarina glauca)	9	4	0.6	90	No visual defects	2a May only live for 15-40 years	Good	Mature		7.2	2.8	Retain
95	371	Tallowwood (Eucalyptus microcorys)	14	6	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Retain
94	372	Swamp mahogany (Eucalyptus robusta)	13	4.5	0.45	90	No visual defects	2c removed for more suitable planting	Fair	Mature	Multi stemmed specimen	5.4	2.5	Retain
93	373	River she oak (Casuarina cunninghamiana)	8	2	0.18	80	No visual defects	2a May only live for 15-40 years	Fair	Mature		2.2	1.9	Retain
92	374	River she oak (Casuarina cunninghamiana)	8	2	0.18	80	No Value	2a May only live for 15-40 years	Fair	Mature	Lopped for power line clearance	2.2	1.9	Retain
88	375	River she oak (Casuarina cunninghamiana)	5	1.5	0.18	80	No Value	2a May only live for 15-40 years	Fair	Mature	Lopped for power line clearance	2.2	1.9	Retain
76	376	Melaleuca styphelioides	14	5.5	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Remove
74	377	River she oak (Casuarina cunninghamiana)	16	4	0.3	100	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Remove
73	378	Melaleuca decora	11	4	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Remove
75	379	River she oak (Casuarina cunninghamiana)	16	4	0.3	100	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Remove
72	380	Melaleuca decora	13	5	0.5	95	No visual defects	1a >40 years	Good	Mature		6	2.6	Remove

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
100-104	381	Cocos palm (Syagrus romanzoffiana)	9	2.5	0.2	100	No visual defects	2c removed for more suitable planting	Good	Mature		2.4	1.6	Retain
99	383	Melaleuca decora	6	2	0.3	95	No visual defects	1a >40 years	Good	Mature		3.6	2.2	Retain
98	383a	Melaleuca decora	6	1.5	0.3	70	No visual defects	1a >40 years	Fair	Mature	On railway land against fence	6	2.6	Retain
97	384	River she oak (Casuarina cunninghamiana)	8	2	0.18	80	No visual defects	2a May only live for 15-40 years	Fair	Mature		2.2	1.9	Retain
96	385	Melaleuca styphelioides	9	4.5	0.55	90	No visual defects	2a May only live for 15-40 years	Good	Mature	Small wound at base	6.6	2.6	Remove
65	386	Brushbox (Lophostemon confertus)	9	5	0.35	100	No visual defects	1a >40 years	Good	Mature		4.2	2.3	Remove
66	387	Brushbox (Lophostemon confertus)	9	5	0.35	100	No visual defects	1a >40 years	Good	Mature		4.2	2.3	Remove
67	388	River she oak (Casuarina cunninghamiana)	10	4.5	0.45	95	No visual defects	1a >40 years	Good	Mature		5.4	2.5	Remove
68	389	Melaleuca decora	8	3	0.25	95	No visual defects	1a >40 years	Good	Mature		3	2.1	Remove
NA	390	Swamp she oak (Casuarina glauca)	5	1.5	0.1	80	No visual defects	2c removed for more suitable planting	Fair	Mature	Suppressed	1.2	1.6	Remove
90	391	Melia azedarach	9	7	0.35	95	No visual defects	2a May only live for 15-40 years	Fair	Mature		4.7	2.3	Remove
106	393	Melaleuca styphelioides	12	13	0.7	95	No visual defects	1a >40 years	Good	Mature	stem wound	8	3	Remove
105	395	River she oak (Casuarina cunninghamiana)	17	4	0.7	95	No visual defects	2a May only live for 15-40 years	Fair	Mature		8	3	Remove
69	396	River she oak (Casuarina cunninghamiana)	10	4.5	0.45	95	No visual defects	1a >40 years	Good	Mature		5.4	2.5	Remove
70	397	Melaleuca decora	10	4.5	0.45	95	No visual defects	1a >40 years	Good	Mature		5.4	2.5	Remove

Survey #	Tree #	Species	Height (m)	Spread (m)	DBH (m)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)	Remove/retain
71	398	River she oak (Casuarina cunninghamiana)	10	4.5	0.45	95	No visual defects	1a >40 years	Good	Mature		5.4	2.5	Remove
78	400	Melaleuca styphelioides	14	10	0.6	90	Included union	1a >40 years	Good	Mature		7.2	2.5	Remove
NA	403	Olive (Olea europaea)	4	1.5	0.08	95	No visual defects	2c removed for more suitable planting	Good	Mature		1	1.2	Remove
NA	404	Olive (Olea europaea)	4	1.5	0.08	95	No visual defects	2c removed for more suitable planting	Good	Mature		1	1.2	Remove

KEY

Tree No: Relates to the number allocated to each tree for the Tree Plan.

Height: Height of the tree to the nearest metre.

Spread: The average spread of the canopy measured from the trunk.

DBH: Diameter at breast height. An industry standard for measuring trees at 1.4 metres above ground level, this measurement is used to help calculate Tree Protection Zones.

Live Crown Ratio: Percentage of foliage cover for a particular species.

Age Class:	Young:	Recently planted tree	Semi-mature:< 20% of life expectancy
	Mature:	20-90% of life expectancy	Over-mature:>90% of life expectancy

SULE: See SULE methodology in the Appendix 3

Tree Protection Zone (TPZ): The minimum area set aside for the protection of the trees trunk, canopy and root system throughout the construction process. Breaches of the TPZ will be specified in the recommendations section of the report.

Structural Root Zone (SRZ): The SRZ is a specified distance measured from the trunk that is set aside for the protection of the trees roots both structural and fibrous.

Appendix 3

SULE categories (after Barrell, 2001)[1]

SULE Category	Description
Long	*Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.*
1a	Structurally sound trees located in positions that can accommodate for future growth
1b	Trees that could be made suitable for retention in the long term by remedial tree care.
1c	Trees of special significance that would warrant extraordinary efforts to secure their long term retention.
Medium	*Trees that appeared to be retainable at the time of assessment for 15-40 years with an acceptable level of risk.*
2a	Trees that may only live for 15-40 years
2b	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons
2c	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide for new planting.
2d	Trees that could be made suitable for retention in the medium term by remedial tree care.
Short	*Trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable level of risk.*
3a	Trees that may only live for another 5-15 years
3b	Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
3c	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
3d	Trees that require substantial remedial tree care and are only suitable for retention in the short term.
Remove	*Trees that should be removed within the next five years.*
4a	Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
4b	Dangerous trees because of instability or loss of adjacent trees
4c	Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
4d	Damaged trees that are clearly not safe to retain.
4e	Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
4f	Trees that are damaging or may cause damage to existing structures within 5 years.
4g	Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
4h	Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.
Small	*Small or young trees that can be reliably moved or replaced.*
5a	Small trees less than 5m in height.
5b	Young trees less than 15 years old but over 5m in height.
5c	Formal hedges and trees intended for regular pruning to artificially control growth.

updated 01/04/01)

1 (Barrell, J. (2001) "SULE: Its use and status into the new millennium" in *Management of mature trees*, Proceedings of the 4th NAAA Tree Management Seminar, NAAA, Sydney.

Appendix 4

TPZ and SRZ methodology

Determining the Tree Protection Zone (TPZ)

The radium of the TPZ is calculated for each tree by multiplying its DBH x 12.

TPZ = DBH x 12

Where

DBH = trunk diameter measured at 1.4 metres above ground

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

A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 metre outside the crown projection.

Determining the Structural Root Zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula or Figure 1. Root investigation may provide more information on the extent of these roots.

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 0.15m will be 1.5m (see Figure 1).

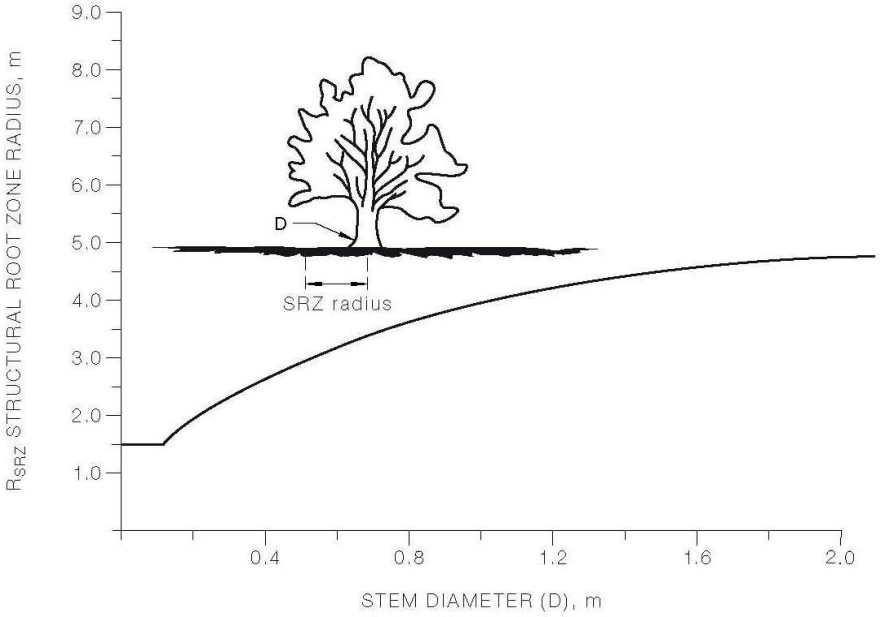


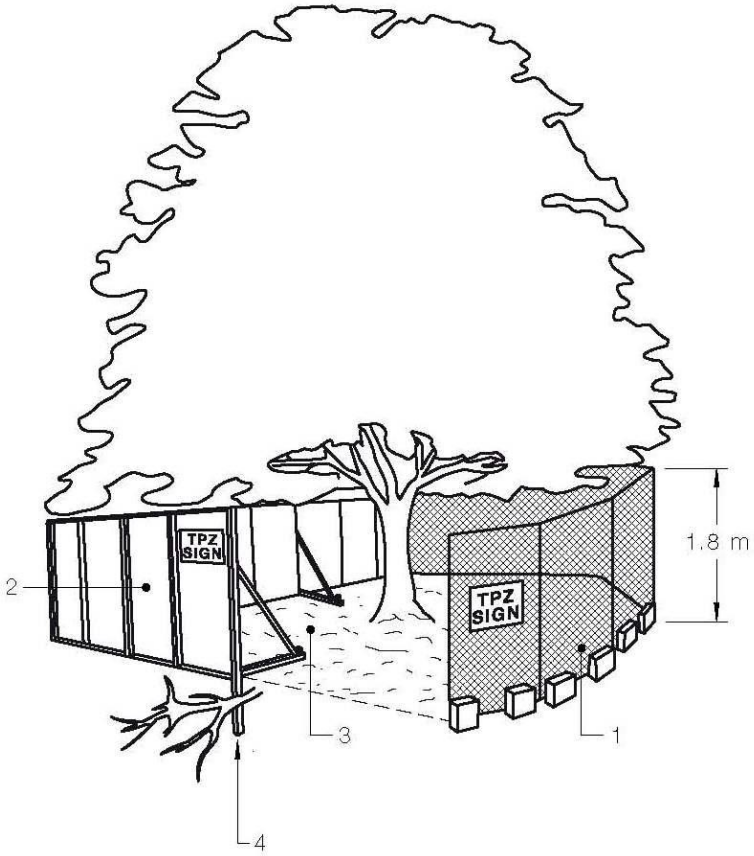
FIGURE 1 - STRUCTURAL ROOT ZONE

Notes:

1 R_{SRZ} is the structural root zone radius.
2 *D* is the stem diameter measured immediately above root buttress.
3 The SRZ for trees less than o.15 metres diameter is 1.5 metres.
4 The SRZ formula and graph do not apply to palms, other monocots, cycads and tree ferns.
5 This does not apply to trees with an asymmetrical root plate.

Appendix 5

Tree protection fencing specifications



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.

Figure 1: Protective fencing as specified in AS 4970, 2009.

Appendix 6

Tree protection sign

sign sample

Moore Trees
Tree Consultancy
0411 712 887

Tree Protection Zone

Fence not to be moved without approval from Arborist

Within this fence there is to be

NO

Storage of materials

Trenching or excavation

Washing of tools or equipment

Appendix 7

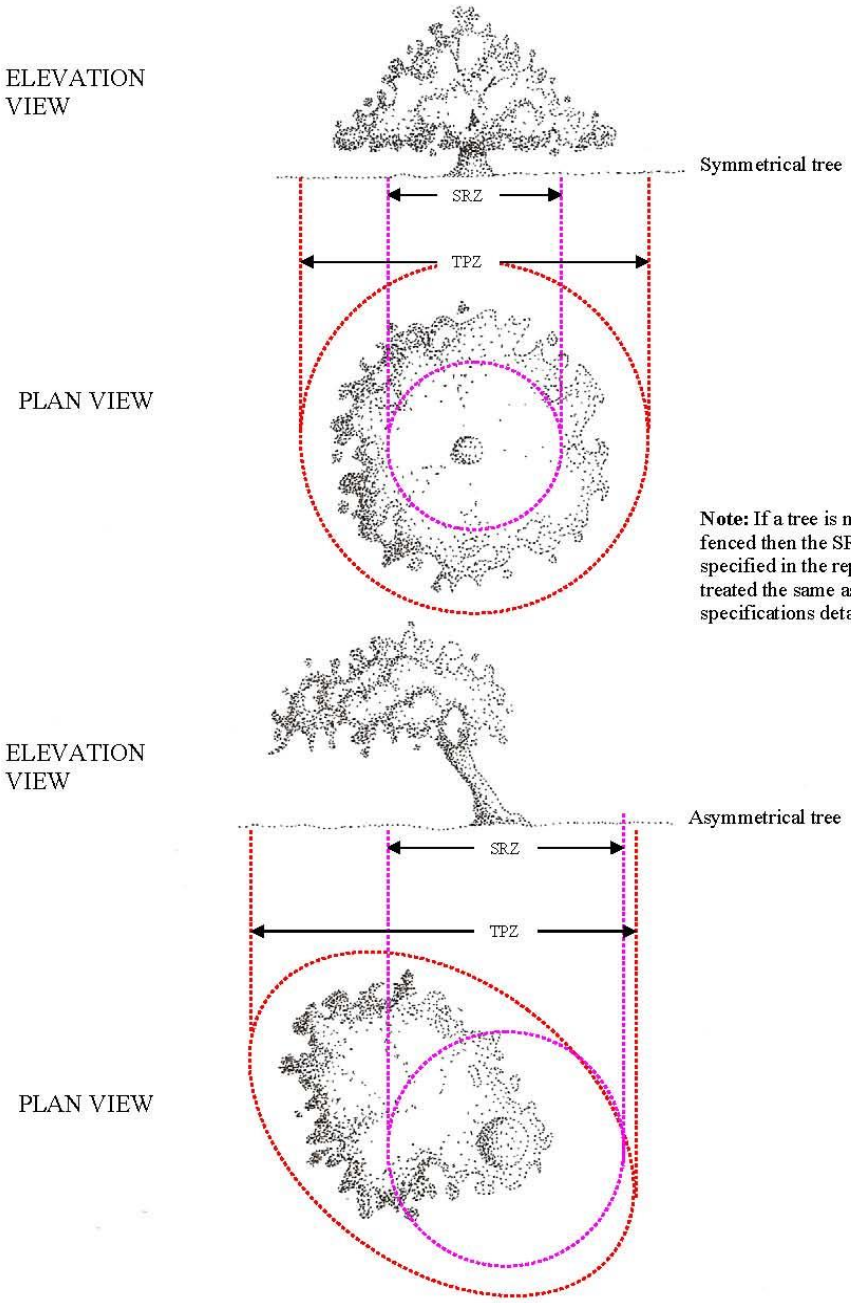


Figure 1: Indicative Tree Protection Zone (TPZ) and Root Protection Zone (SRZ)
Drawn: P. Vezgoff ©

Appendix 8

Tree structure information diagram

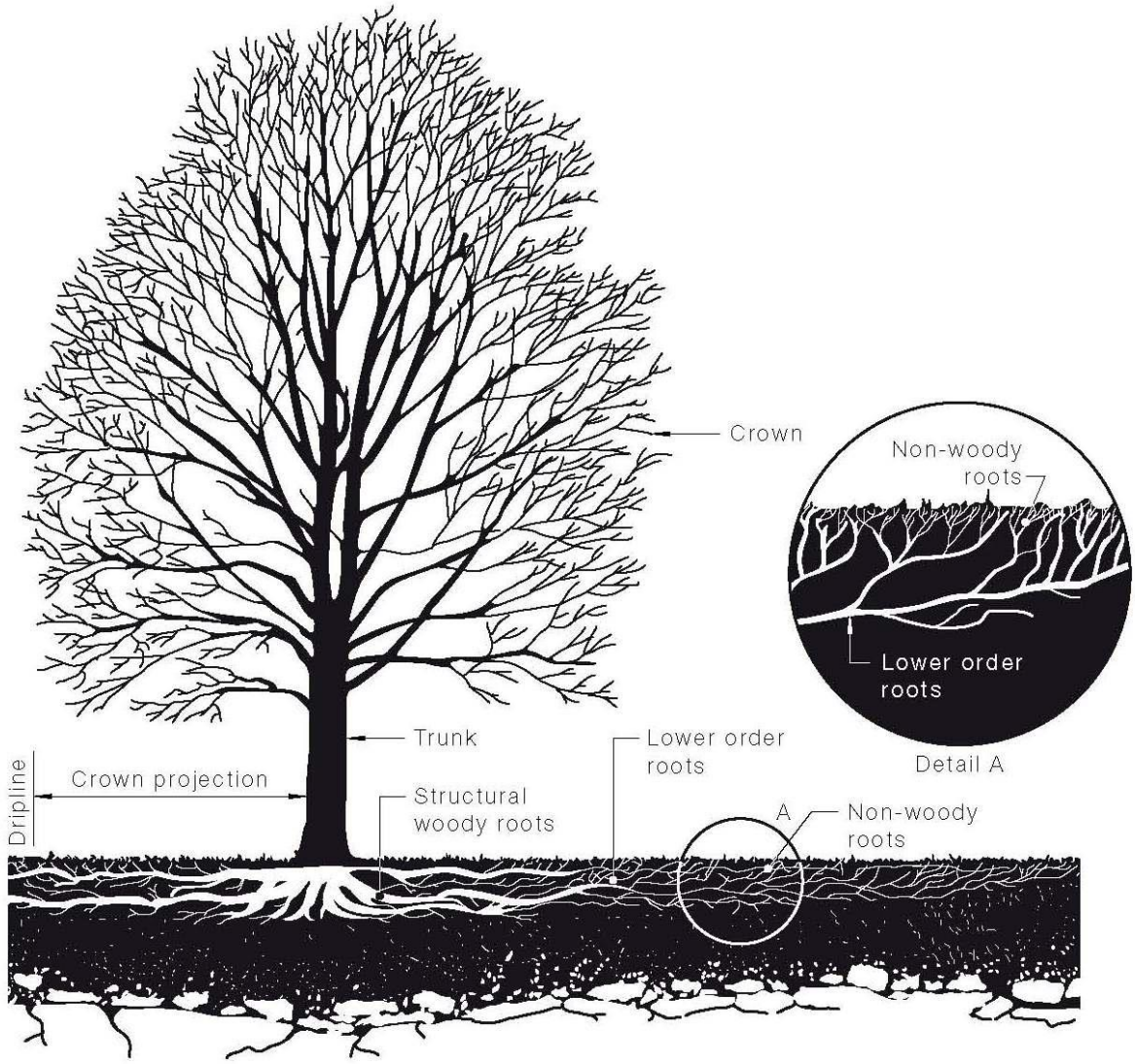


Figure 2: Structure of a tree in a normal growing environment (AS 4970, 2009.).

Appendix 9

Explanatory Notes

- **Mathematical abbreviations:** > = Greater than; < = Less than.

- **Measurements/estimates:** All dimensions are estimates unless otherwise indicated. Less reliable estimated dimensions are indicated with a '?'.

- **Species:** The species identification is based on visual observations and the common English name of what the tree appeared to be is listed first, with the botanical name after in brackets. In some instances, it may be difficult to quickly and accurately identify a particular tree without further detailed investigations. Where there is some doubt of the precise species of tree, it is indicated with a '?' after the name in order to avoid delay in the production of the report. The botanical name is followed by the abbreviation sp if only the genus is known. The species listed for groups and hedges represent the main component and there may be other minor species not listed.

- **Height:** Height is estimated to the nearest metre.

- **Spread:** The maximum crown spread is visually estimated to the nearest metre from the centre of the trunk to the tips of the live lateral branches.

- **Diameter:** These figures relate to 1.4m above ground level and are recorded in centimetres. If appropriate, diameter is measure with a diameter tape. 'M' indicates trees or shrubs with multiple stems.

- **Estimated Age:** Age is estimated from visual indicators and it should only be taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records or local knowledge.

- **Distance to Structures:** This is estimated to the nearest metre and intended as an indication rather than a precise measurement.

Appendix 10

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EDUCATION and QUALIFICATIONS

- 2013 / 2018 – ISA TRAQ qualification
- 2007 – Diploma of Arboriculture (AQF Cert V) Ryde TAFE. (Distinction)
- 1997 – Completed Certificate in Crane and Plant Electrical Safety
- 1996 – Attained Tree Surgeon Certificate (AQF Cert II) at Ryde TAFE
- 1990 – Completed two month intensive course on garden design at the Inchbald School of Design, London, United Kingdom
- 1990 – Completed patio, window box and balcony garden design course at Brighton College of Technology, United Kingdom
- 1989 – Awarded the Big Brother Movement Award for Horticulture (a grant by Lady Peggy Pagan to enable horticulture training in the United Kingdom)
- 1989 – Attained Certificate of Horticulture (AQF Cert IV) at Wollongong TAFE

INDUSTRY EXPERIENCE

Moore Trees Arboricultural Services **January 2006 to date**
Tree Consultancy and tree ultrasound. Tree hazard and risk assessment, Arborist development application reports
Tree management plans.

Woollahra Municipal Council **Oct 1995 to February 2008**
ARBORICULTURE TECHNICAL OFFICER
August 2005 – February 2008
ACTING COORDINATOR OF TREES MAINTENANCE
June – July 2005, 2006
Responsible for all duties concerning park and street trees. Prioritising work duties, delegation of work and staff supervision.
TEAM LEADER
January 2003 – June 2005
September 2000 – January 2003
HORTICULTURALIST
October 1995 – September 2000

Northern Landscape Services **July to Oct 1995**
Tradesman for Landscape Construction business

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CONFERENCES AND WORKSHOPS ATTENDED

- International Society of Arboriculture Conference (Canberra May 2017)
- QTRA Conference, Sydney Australia (November 2016)
- TRAQ Conference, Auckland NZ / Sydney (2013/2018)
- International Society of Arboriculture Conference (Brisbane 2008)
- Tree related hazards: recognition and assessment by Dr David Londsdale (Brisbane 2008)
- Tree risk management: requirements for a defensible system by Dr David Londsdale (Brisbane 2008)
- Tree dynamics and wind forces by Ken James (Brisbane 2008)
- Wood decay and fungal strategies by Dr F.W.M.R. Schwarze (Brisbane 2008)
- Tree Disputes in the Land & Environment Court – The Law Society (Sydney 2007)
- Barrell Tree Care Workshop- Trees on construction sites (Sydney 2005).
- Tree Logic Seminar- Urban tree risk management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar presented by Dr F.W.M.R. Schwarze (Sydney 2004)
- Inaugural National Arborist Association of Australia (NAAA) tree management workshop- Assessing hazardous trees and their Safe Useful Life Expectancy (SULE) (Sydney 1997).