MCARDLE
ARBORICULTURAL
CONSULTANCY

REPORT: Arborist Impact Assessment

REPORT COMMISSIONED FOR:

Principal: Amanda Connelly
Root Partnerships: C/o Onell Hermis

O'Connell Street Public School
Parramatta

New South Wales
2150

18th April 2019

PREPARED BY:

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1.0 ABSTRACT

1.1 An Arborist Impact Assessment was commissioned in relation to the proposed installation of a shade sail at O'Connell Street Public School Parramatta New South Wales 2150. One (1) tree in the surrounding area of the proposed installations on the site was assessed. Footing D for the proposed installation will have minimal impact to the tree and remain viable with this proposed construction.

1.2 One (1) *Plumeria spp.* Frangipani tree has been assessed on the site and has been given a moderate retention value, the tree is located within a historic precinct.

1.3 The proposed additions will impact upon one (1) tree on site, which will result in the tree being retained and protected. Tree Trunk Protection is required for Tree 1 with a 200mm clearance maintained between infrastructure and the canopy. No work is to be carried out within the TPZ which is a setback of 4.00 from the base without supervision of the AQF level 5 arborist being present.

1.4 Tree Protection Systems are required and must be installed, prior to commencement of the development for Tree 1 and certified compliant by an AQF level 5 arborist.

REFERENCES

Structural Drawing Location Plan. Joeseph Bonica Drawing No s05 Revision C.
Tonkin Zulaikha Greer Architects. Site Plan. Dated 25/1/2019.
Parramatta Development Control Plan 2011.

2.0 INTRODUCTION

2.1 An Arborist Impact Assessment was commissioned in relation to a proposed shade sail at O'Connell Street Public School Parramatta New South Wales 2150. One (1) tree in the surrounding area of the proposed works were assessed by Jim McArdle B.Ed. Sc ACU, Dip Arb AQF L5 Ryde, QTRA, TRA Assessor and TCAA President whom attended site on the 25th of March 2019.

2.2 The retention value of one (1) tree, *Plumeria spp.* Frangipani, has been assessed on the site to be of moderate retention value.

2.3 Retention and Protection measures will be required of one (1) tree.

2.4 Tree Trunk Protection over the TPZ of Tree 1 is required and a minimum 20cm clearance of the canopy. Sensitive construction methods are required for any work the setback area of the TPZ of Tree 1 with any work to be supervised by an AQF level 5 certified arborist. Excavations are to enter the TPZ of the preserved tree with a 100mm diameter footing.

2.5 McArdle Arboricultural Consultancy Pty Ltd prepared the report. The Arboricultural Impact Assessment report is developed to assess the trees at the above address for health and status. Ms Caryssa Jones B.Bio.Cons MQ, Tree Risk Assessor, Dip Arb AQF L5 Ryde (pending) under the supervision of Mr James McArdle B.Ed. Sc ACU, Dip Arb AQF L5 Ryde, QTRA, Tree Risk Assessor and TCAA President, conducted the evaluation using Visual Tree Assessment (VTA) according to Claus Mattheck and Breloer (1994) method for biological and lower level mechanical functions. The systems are in accordance with industry best practice and impact assessments are based upon the Australian Standards AS4970-2009 *Protection of Trees on Development Sites* and Australian Standards 4373-2007 *Pruning of Amenity Trees.*

3.0 AIMS

The aim of the report is to:

3.1 To assess one (1) tree at O'Connell Street Public School Parramatta NSW 2150 according to the methodologies presented in this report.

3.2 To give recommendations for management and protection during the proposed development. Protection measures will be referenced from *Australian Standards AS4970 2009 Tree Protection on Development Sites.*

4.0 METHODOLOGY

4.1 This arborist impact assessment uses a ground Visual Tree Assessment (VTA) method employed in this report. The VTA system is based on the theory of tree biology, physiology and tree architecture and structure and is a method used to identify visible signs on trees that indicate health and potential hazards.

4.2 The collection of data is performed in the field by an AQF Level 5 arborist. The assessment summaries the species, height and diameter, the trees health and structural condition for each trees, hazards, and retention categories were assigned to each tree.

4.3 Testing on site may include, mallet sounding, non-invasive testing for hollows, probing cavities, white ant infestation. Invasive tests will determine the depth of decay around cavities. All testing is ground based, options may include further investigation.

4.4 Impact assessment data was recorded in a Tree Survey Table with various assessment methods, setbacks are calculated according to *Australian Standards AS 4970 2009 Protection of Trees on Development Sit*es. Including:

Appendix A: Tree Useful Life Expectancy TULE 2014. Gives extra assessment life expectancy categories range to no potential for life expectancy. *Adapted from Jeremy Barrell 2014*

Appendix B: Health & Structural Condition of Tree Assessment. This describes the vigour and vitality of the tree. *Mattheck 1994 The Body Language of Trees.*

Appendix C: Retention Values. Some trees have special restrictions including cultural, scientific, historical or threatened category and may be reviewed as part of this report or further reporting. *Morton, 2006 Determining Landscape Significance Rating.*

Appendix D: Tree Protection. Details of Tree Protection Zones and minimum setback, distances for each numbered tree. *Australian Standards AS 4970 2009 Protection of Tree on Development Sites.*

5.0 PLANNING GUIDELINES AND SPECIFIC LEGISLATION

5.1 Tree management measures are in place for Parramatta Council under the provisions of the trees and vegetation preservation for properties covered under the Parramatta Development Control Plan 2011.

5.2 Land Zoning is Mixed Use B4 with Acid Sulfate Soils Class 5 according to the NSW Planning Portal with State Heritage Act: Kings School Group (former) and General Heritage (Figure 3).

5.3 A search of local and state heritage registers, tree registers and determination of landscape significance were carried out for tree identified in the survey, noting a heritage area is related to this property.

5.4 SIGNIFICANCE IN THE ENVIRONMENT Trees are subject to the following legislation:

Biodiversity Conservation Act NSW (BIO Act 2016) provides provisions for conserving biodiversity.

Threatened Species Conservation Act NSW (1995 TCS Act). Provides provision for conserving threatened species, populations and ecological communities of animals and plants as well as managing key threatening processes.

Environmental Protection and Biodiversity Conservation Act NSW (EPBC Act 1999) provides provision to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places.

5.5 SIGNIFICANCE IN THE LANDSCAPE

Trees are generally categorised as either:

- Significant in the landscape; based on a broad landscape perspective, including streetscape.
- HIGH retention value.
- Significant in the landscape; based on a neighbourhood perspective. Retained due to its status but may have some conditions or health issues. HIGH retention value.
- Significant in the landscape; based on an adjacent area surrounding the site. HIGH retention value.
- Good and worthy of preservation; retained due to its status, but may have minor conditions or health issues. MODERATE retention value.
- Worthy of preservation; retained due to its status, but may have major conditions or health issues. MODERATE retention value. According to TULE.
- Retain if Possible LOW retention value.
- Exempt VERY LOW retention value.

Retention Values Tables based on Melanie Howden and Andrew Morton.
Tree Useful Life Expectancy TULE Adapted from Jeremy Barrell for use by TCAA consultant arborists. Tree Contractor's Association of Australia TCAA.

6.0 ANALYSIS OF MAPPING CONTROLS

Figure 1
Land Zoning

Mixed Use : (pub. 2015-12-18) B4

Figure 2
Sulfate Soils

Class 5 (pub. 2015-12-18) 5

Figure 3
Heritage

State Heritage Act : Kings School Group (former) (pub. 1999-04-02)

State Heritage Act : Marsden Rehabilitation Centre Group (pub. 1999-04-02)

Item - General : Marsden Rehabilitation Centre and potential archaeological site (pub. 2015-12-18)

7.0 THE SITE

7.1 The site is O'Connell Street Public School New South Wales 2150. The site is relatively flat with little native vegetation remaining. The site is within State Heritage and General Heritage.

7.2 The collection of survey data was limited, and an inspection was conducted on the 25th of March 2019.

7.3 SCALED SITE MAP

Figure 4. Map of site location.

8.0 TREE SURVEY TABLE 1

Tree No.	Location	Scientific& Common Name	Crown Spread (m)	Height (m)	Diam (cm)	TPZ SRZ (m)	Condition of Tree & Failure potential (Health &Structure) (Defect & Measurements)	TULE	Retention Values	Impacts
1	Courtyard of Kindergartens	*Plumeria spp.* Frangipani	N-5.6 S-0 WE-8.2	7	20/22 /24/8 42	4.00 2.3	Mature, unbalanced North, crown lifted to 2m, previous pruning South of cuts greater than 200mm with callus of 40mm over cut. Inclusion at base, lesions along stems, minor cavity east at base 10x10cm, minor decay on southern lower branches. Push test showed little movement, some dehydration. Growing on slight embankment with 15mm thick sponge ground cover surrounding the base with a 50mm gap around the trunk base. Protected south and west by building.	2d	Moderate	RETAIN & PROTECT Prune dehydrated branch at 2m north. Irrigation

9.0 FINDINGS

Plate 1. Tree 1 *Plumeria spp.* Frangipani.

Plate 2. Tree 1 Unbalanced canopy North.

Plate 3. Ground covering surrounding base of tree.

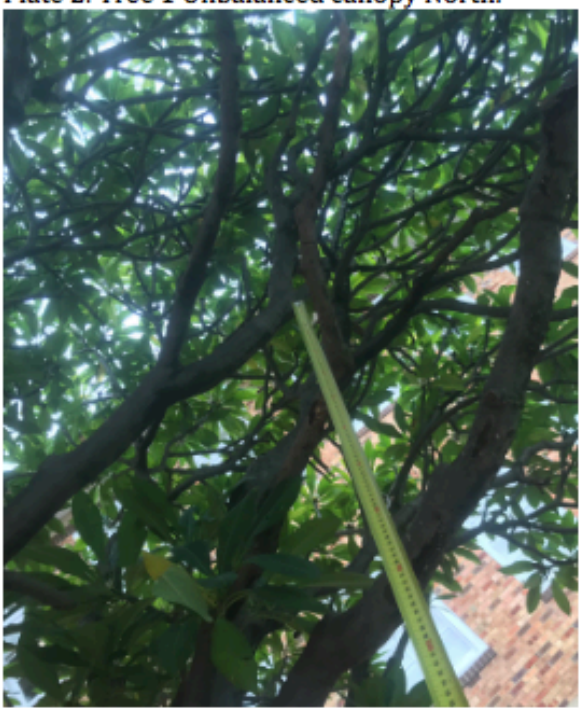
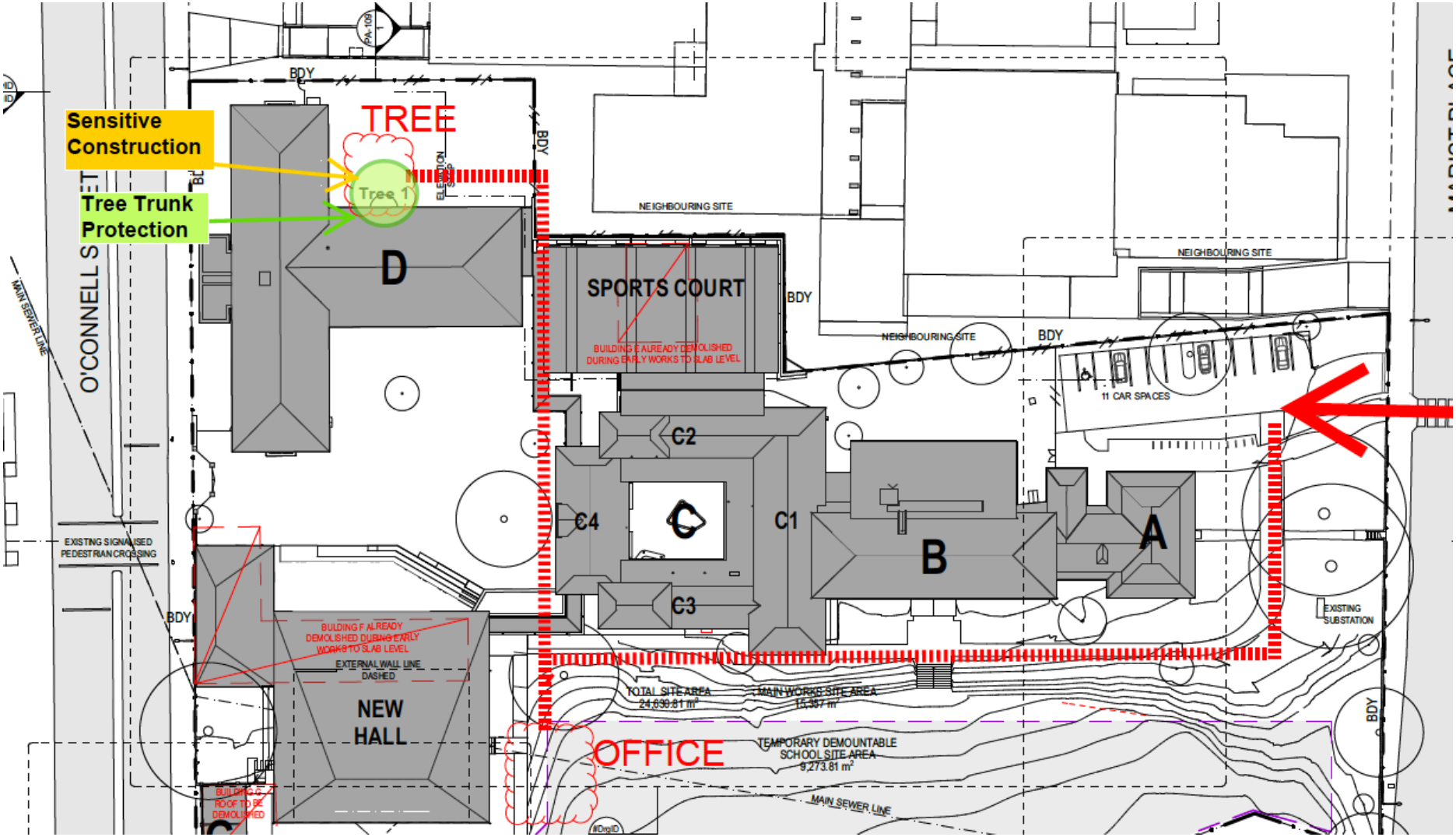


Plate 4. Prune dehydrated branch 2m North.

10.0 TREE MANAGEMENT PLAN



11.0 DISCUSSION

11.1 One tree on site was assessed on site, Tree 1 *Plumeria spp*. Frangipani, which is a feature tree in the Courtyard. Tree 1 is of Moderate retention value and is to be retained and protected.

11.2 The impacts from the proposed shade sail may impact Tree 1 canopy and root system. The height of the canopy is 3.5 metres and the footing is 100mm diameter, this can be hand excavated and as the canopy will enter the TPZ at 2.5 metres on the north eastern side it will still be able to absorb solar gain from the north and the western sides. At 3.5 metres the canopy will be impacted, but is outside the Structural root zone.

11.3 Roots would be able to be pruned of less than 40mm normally outside the structural rootzone of 2.3 metres under supervision. However, we would highly recommend that the roots stay intact and the footing be placed within an area that does have clearance of 200mm to any major root and canopy branch. The TPZ impact is 6% and the root zone impact is 6%combined is 12%. (See fig 1). The Australian standards also state that the tree (combined) has an impact greater than 10% which would trigger sensitive construction. This would require that the AQF level 5 arborist id present when excavation and installation of the footing and pole erection. Note figure 1 the installation of the footing is outside the SRZ.

11.4 Pruning of the tertiary branches would be anticipated with no cuts allowed greater than 20mm due to the heritage significance of this tree. To ensure Tree 1 is protected accordingly sensitive construction is required for any work within two metres of the TPZ. There is to be no excavations within the SRZ of Tree 1 and all excavations required for the holes within two metres setback of the TPZ must be supervised by an AQF level 5 Arborist. There must be a 20cm clearance maintained between the canopy and any infrastructure.

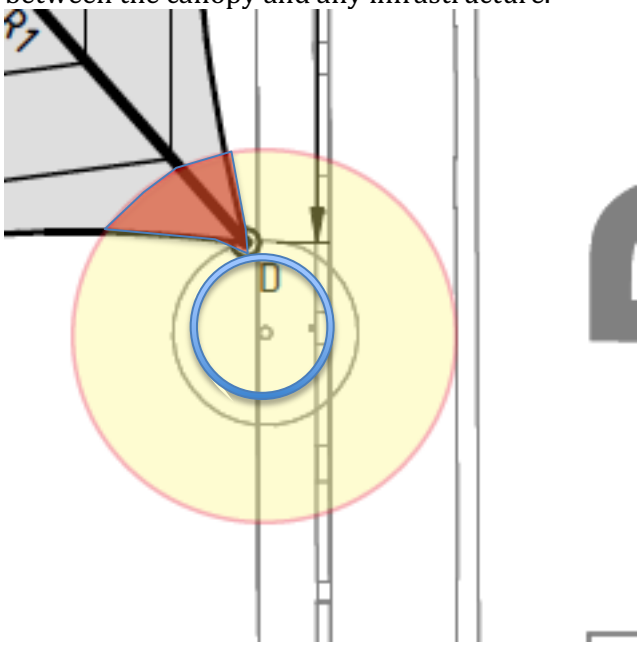


Fig 1. The impact of the roots encroachment and canopy encroachment combined (red hatch colour) is greater than 10% triggering sensitive construction. TPZ is coloured yellow circle with red outline. The blue line is the SRZ-structural root zone at 2.3metres form the tree centre.

11.5 As a result of the shade cloth, Tree 1 is likely to experience solar loss. As *Plumeria spp.* require high levels of sunlight it is highly recommended. The canopy will reflect light from the top of its sails surface increasing solar gain and this should not impact the tree. This is a suitable approach in aiming to maintain the health of the tree.

11.6 It is recommended that the dehydrated branch north at 2m is pruned. Additional pruning will be required for the installation of the shade sail where it enters the canopy at 3.5metres *(See fig 2).* As the canopy height is 3-7metres the sail area will require lower branches of less than 20mm to be pruned. The tree has been significantly pruned from crown lifting and this will not unbalance the tree. Consistent inspection over the course of the development is recommended to document and remediate if necessary the overall health of the tree.

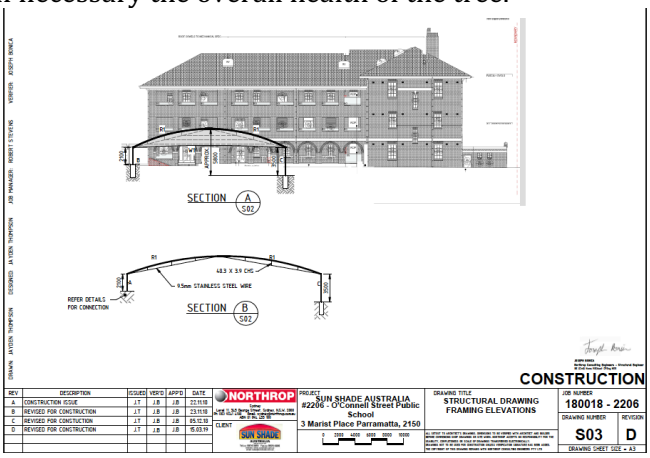


Fig 2. The height of the sailshade area intercepts the canopy at 3.5metres.

11.7 To assist in competent pruning of the tree, contractors must be AQF level 3 licensed arborists and must work in accordance with *Australian Standards AS/4743-2007 Pruning of Amenity Trees* and *SafeWork NSW Guide to Managing Risks Tree Trimming Removal.* A registered current member of Tree Contractors Association Australia (TCAA) or Arboriculture Australia (AA) must complete the works.

11.8 An AQF level 5 Arborist must supervise all works within the TPZ of Tree 1 and if the proposed development plans are altered than a new impact assessment must be conducted for affected trees.

12.0 OPTIONS

1. Retain and protect Tree 1utilising Sensitive Construction.
2. Remove and replenish Tree 1.

12.1 CONCLUSION

The best choice is Option 1 as Tree 1 is of Moderate retention value on Heritage grounds and adds amenity to the surround courtyard. Retain and protect Tree 1 using tree trunk protection and supervision for any work within two metres of the trees TPZ as specified in the discussion.

13.0 HOLDING POINTS - Retention and Protection of Trees

13.1 Any pruning greater than 20mm within the TPZ of Tree 1 will need to be cut cleanly under supervision of an AQF Level 5 certified Arborist in accordance to *Australian Standards AS4373 2007 Pruning of Amenity Trees*. This will include clearances and crown canopy modification of any type.

13.2 Retention and protection of one (1) tree utilising tree trunk protection.

13.3 An AQF level 5 Arborist must install or supervise Tree Trunk Protection of 50mmx100mmx2m lengths with 150mm airgaps secured with underlay of carpet or hessian wrapped around the trunk. Hessian can be utilised to protect the canopy during the install. The installation found in the Tree Management Plan is to be installed prior to any demolition, construction or re-landscaping.

13.4 Sensitive construction for all work required within setback of the TPZ of Tree 1 must be supervised by the AQF level 5 certified arborist. There is to be no excavations within the 4.00m setback without AQF level 5 arborist being present to ensure clearance of 200mm to any significant roots or branches..

13.5 Monthly inspections by an AQF level 5 arborist are required for this site and need to be complied with for the duration of the development. Certification of tree protection as per Tree Protection Plan by AQF level 5 Arborist prior to any demolition, construction or re-landscaping.

13.6 Prohibitions are listed Appendix D, to be complied with and certified by an AQF level 5 Arborist.

14.0 RECOMMENDATION

14.1 One (1) tree is to be retained and protected, numbered Tree 1. Protection of Tree 1 will involve Tree Trunk Protection and all work within two metres of the TPZ must be supervised by an AQF level 5 arborist. No excavation of any depth is to be carried out within the TPZ of Tree 1.

14.2 Pruning of Tree 1 maybe required for shade sail installation on the north eastern side at 3.5 metres height. Pruning is to be supervised by an AQF level 5 arborist ensuring pruning is done in accordance to *Australian Standards AS4373 2007 Pruning of Amenity Trees.*

14.3 Holding points 13.1-13.6 will be compliant by an AQF level 5 arborist.

14.4 To assist in competent pruning of the tree, contractors must be AQF level 3 licensed arborists and must work in accordance with *Australian Standards AS4790-2009 Protection of Trees in Development Sites* and *Australian Standards AS/4743-2007 Pruning of Amenity Trees* and *SafeWork NSW Guide to Managing Risks Tree Trimming Removal.* A registered current member of Tree Contractors Association Australia (TCAA) or Arborists Australia (AA) must complete the works.

15.0 GLOSSARY

Borer: larvae beetles, moths or wasps that cause damage within the phloem/cambium, sapwood and heartwood of the tree. Borers generally attack weakened trees or stressed trees.
Cambium: The layer of cells between the exterior bark and the inner wood which control cell division, hence stem, branch and shoot expansion.
Cavity: A void, initiated by a wound within the trunk, branches or roots. These voids are referred to as hollows.
Co-dominant: Stems or branches equal in size and relative importance.
Crown: The width of the foliage in the upper canopy of the assessed tree to the four cardinal points.
Crown lifting: The removal of the lower branches of the tree.
Crown thinning: The portion of the tree consisting of branches and leaves and any part of the stem from which branches arise.
Drip line: Where the canopy releases water shed from the foliage during precipitation.
DBH/Diameter: Diameter of trunk at 14meters in height of assessed tree.
Dead wooding: The removal dead branches from a tree.
Dieback: Tree deterioration where the branches and leaves die.
Flush cut: A cut that damages or removes the branch collar or removes the branch and stem tissue and is inconsistent with the branch attachment as indicated by the bark branch ridge.
Genus/ Species: Identified using its scientific name. Where the species name is not known, species is used. The common name for trees may vary considerably in each area of geographical differences and so will not be used in the field survey.
Height: Height has been estimated to + / - 2 meters.
Maturity: Tree age, Assessed as over mature (last 1/3 of life expectancy), mature (1/3 to 2/3 life expectancy) and semi mature (less than 1/3 life expectancy).
Remedial (restorative) pruning: includes: Removing damaged, deadwood; trimming diseased or infested branches. Trimming branches back to undamaged tissue in order to induce the production of shoots from latent or adventitious buds, from which a new crown will be established.
SRZ- Structural Root Zone: An area within the trees root zone in which roots stabilize the tree. Roots cut in this zone can cause instability and lead to anchorage loss.
Structural Integrity: Describes the internal supporting timber. (Substantial to frail)
Target: risk targets are people, property or activities that could injure, damage or disrupted.
Tree Numbering: All trees listed in the tree survey have been numbered and plotted.
TULE- Tree Useful Life Expectancy: An estimation of the trees useful life expectancy using appropriate industry methods with an inspection regime.
Vigour: This is an indication of the tree health. Trees have either been assessed as Good Vigour, Normal Vigour or Low Vigour.

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Watson et al (2014) Up by the Roots. ISA USA.

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www.dpi.nsw.gov.au
http://maps.six.nsw.gov.au/
www.safeworkaustralia.gov.au
https://www.cityofparramatta.nsw.gov.au/

APPENDIX A TREE USEFUL LIFE EXPECTANCY - TULE

Adapted from Jeremy Barrell (SULE) 2014 for TCAA Consultant Arborists						
	1 Long TULE Trees that appeared to be retainable at the time of assessment for more than 40 years with low level of risk	**2 Medium TULE** Trees that appeared to be retainable at the time of assessment for 15 to 40 years with and with low to medium level risk	**3 Short TULE** Trees that appeared to be retainable at the time of assessment for 5 to 15 years with medium to high level of risk	**4 Remove** Trees that should be removed within the next 5 years High to Very high level of risk	**5.No Potential for Retention REMOVE IMMEDIATELY** Trees that must be removed immediately. Very high to Extreme level of risk	**6 Small, Young or Regularly clipped** Trees that can be easily transplanted or replaced.
A	Structurally sound trees located in positions that can accommodate future growth	Trees that may only live for between 15 and 40 more years	Trees that may only live for between 5 and 15 more years	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Dead, dying or declining trees diseased or inhospitable conditions.	Small trees less than 5 meters in height
B	Trees that could be made suitable for retention in the long term by Intervention Works.	Trees that may live for more than 40 years, but would need to be removed for safety or Nuisance reasons	Trees that may live for more than 15 years, but would need to be removed for safety or nuisance reasons	Dangerous trees through instability or recent loss of adjacent trees	Dangerous trees through instability or recent loss of adjacent trees	Young trees less than 15 years old but over 5 meters in height
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention	Trees that may live for more than 40 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	Trees that may live for more than 15 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form	Dangerous trees through structural defects including cavities, decay, included bark, wounds or poor form	Trees that have been regularly pruned to artificially control growth
D		Trees that could be made suitable for retention in the medium term by Intervention Works.	Trees that require substantial Intervention Works, and are only suitable for retention in the short term	Damaged trees that are clearly not safe to retain	Damaged trees that are clearly not safe to retain and must be removed immediately	
E				Trees that may live for more than 5 years, but should be removed to prevent interference with more suitable individuals or to provide space for new planting	High Toxicity Allegan trees, asthmatic and poisonous trees and must be removed immediately.	
F				Trees that may cause damage to existing structures within 5 years	OTHER with legitimate explanation to be removed immediately	
G				Trees that will become dangerous after removal of other trees for reasons given in 1A-1F		
INSPECTION FREQUENCY	Inspection frequency 1-5 Years by competent inspector unless event monitored.	Inspection frequency 1-5 Years by competent inspector unless event monitored.	Inspection frequency 1-3 years by competent inspector unless event monitored.	Inspection frequency to 1 year by competent inspector unless event monitored.	1-7 days by competent inspector and event monitored	Inspection frequency Biannually by competent inspector

APPENDIX B HEALTH & STRUCTURAL CONDITION OF TREE
Visual

KEY	Health & Structural Condition of Tree
1.	Maturity: J- Juvenile; im- Immature; SM-Semi- Mature; M-Mature
2.	Excellent Condition
3.	Good Condition but Poor Development 3b Moderate
4.	Dieback is more than 20%. 4b Epicormics
5.	Sparse Foliage Crown 5b Unbalanced Canopy
6.	Physical Damage
7.	Insect Damage 7b Borers
8.	Fungal Attack
9.	Cavity
10.	Termite Damage Inclusions
11.	Lean
12.	Heavily Pruned 12b Dying
13.	Damage to roots 13b Encroachment
14.	Parasitic Vine Present
15.	Damage by Climbing Plant
16.	inclusions
17.	Habitat Tree
18.	Endangered Species

Mattheck The Body Language of Trees 1994 adapted; Hornsby Shire Council

APPENDIX C RETENTION VALUES

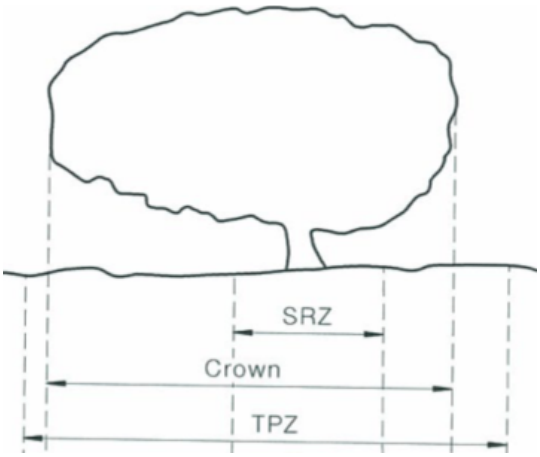
DETERMINING LANDSCAPE SIGNIFICANCE RATING MORTON, A 2006			
RATING	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1. SIGNIFICANT	The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance or is listed on Council's Significant Tree Register.	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999.	The subject tree has a very large live crown size exceeding 300m^2 with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species.
	The subject tree forms part of the curtilage of a Heritage Item (building/structure/artefact as defined under the LEP) and has a known or documented association with that item.	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species.	The subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity.
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event.	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area.	The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.
2. VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc.) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally indigenous species, representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 200m^2, a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.
3. HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence.	The tree is a locally indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link/Wildlife Corridor or has known wildlife habitat value.	The subject tree has a large live crown size exceeding 100m^2; The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. Crown distortion/suppression) with a crown density of at least 70% (normal); The subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area.
4. MODERATE	The tree has no known or suspected historical association, but does not detract or diminish the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of this DCP.	The subject tree has a medium live crown size exceeding 40m^2; The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc.) with a crown density of more than 50% (thinning to normal); and
			The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5. LOW	The subject tree detracts from heritage values or diminishes the value of a heritage item.	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to building or other structures.	The subject tree has a small live crown size of less than 40m^2 and can be replaced within the short term (5-10 years) with new tree planting.
6. VERY LOW	The subject tree is causing significant damage to a heritage Item.	The subject tree is listed as an Environment Weed Species in the relevant Local Government Area, being invasive, or is a known nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% (sparse).
7. INSIGNIFICANT	The tree is completely dead and has no visible habitat value.	The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993 within the relevant Local Government Area.	The tree is completely dead and represents a potential hazard.

APPENDIX C Continued

RETENTION VALUES: MORTON, A 2006 Determining landscape Significant Ratings	
RETENTION VALUE	RECOMMENDED ACTION
High	• These trees considered worthy of preservation; as such careful consideration should be given to their retention as a priority. • Proposed site design and placement of buildings and infrastructure should consider the Tree Protection Zones as discussed in the following section to minimise any adverse impact. • In addition to Tree Protection Zones, the extent of the canopy (canopy dripline) should also be considered, particularly in relation to a high-rise development. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
Moderate	• The retention of these trees is desirable. • These trees should be retained as part of any proposed development if possible, however these trees are considered less critical for retention. • If these trees must be removed, replacement planting should be considered in accordance with Council's Tree Replacement Policy to compensate for loss of amenity.
Low	• These trees are not considered to be worthy of any special measures to ensure their preservation, due to current health, condition or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their SULE. • These trees should not be considered as a constraint to the future development of the site.
Very Low	• These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. • The removal of these trees is therefore recommended regardless of the implications of any proposed development.

APPENDIX D TREE PROTECTION

Extract from *Australian Standard AS4970 2009 Protection of Trees on Development Sites*



D.1 STRUCTURAL ROOT ZONE (SRZ)

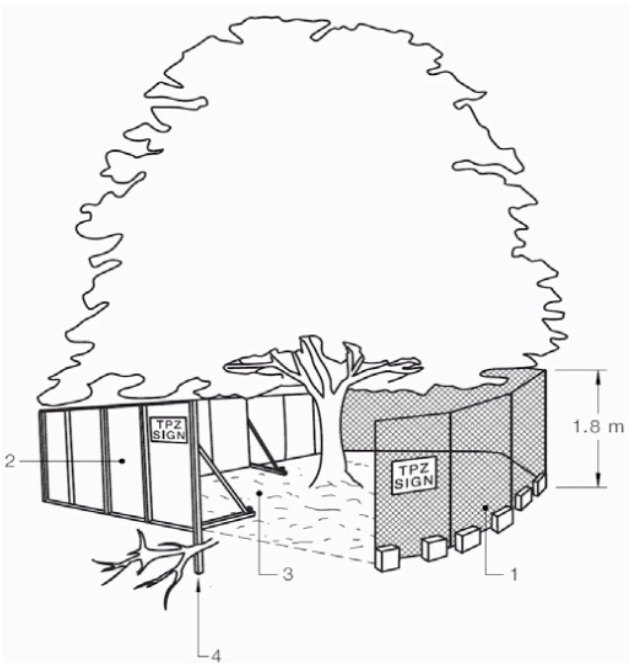
"The SRZ is the area considered essential for tree stability. Temporary tree protection fencing shall be erected around the perimeter of all tree protection zones.

D.2 OTHER TREE PROTECTION MEASURES

When tree protection fencing cannot be installed due to restricted access e.g. tree located along side an access way or requires temporary removal, other tree protection measure should be used, including those set out below;

D.3 PROTECTIVE FENCING

It shall be installed prior to any demolition, clearing, Chain wire mesh panel 1.8-meter cyclone fencing or star pickets at 2m intervals, connected by a continuous highly-visible barrier/hazard mesh at the height of 1.8 meters. Alternative plywood or wooden paling fence panels. This fencing material also prevents building material soil entering the TPZ. Mulch installation across surface of TPZ. Bracing is permissible within the TPZ. Avoid damaging roots. This fencing will remain in place until all the construction work has been completed.



D.4 TREE PROTECTION ZONES

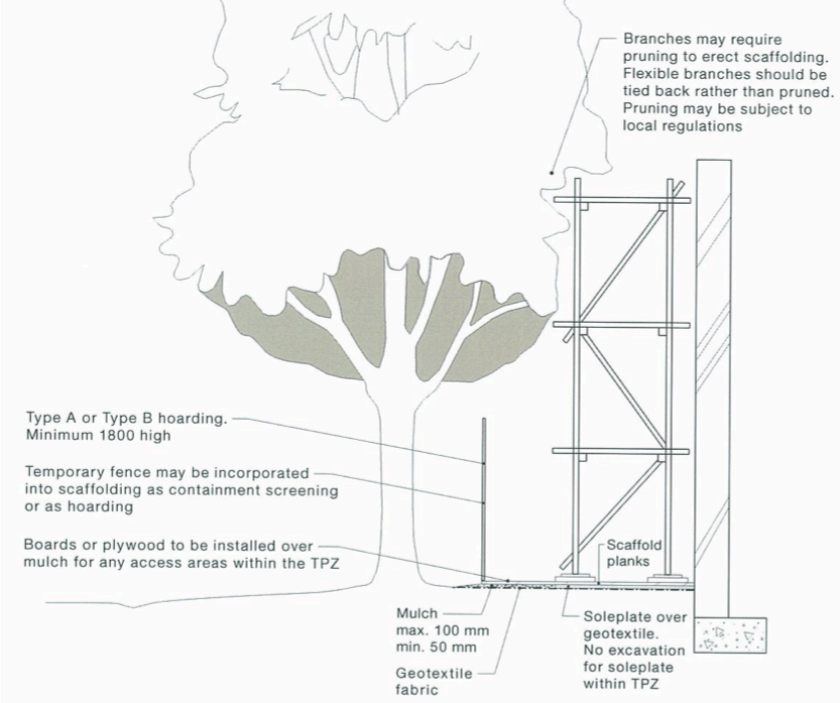
Signage shall be attached to the fence at regular intervals. Signage shall read "TREE PROTECTION ZONE. NO ENTRY EXCEPT TO AUTHORISED PERSONNEL. FINES

D.5 GROUND PROTECTION

If temporary access for machinery is required within the TPZ, ground protection measure will be required to prevent compaction in the root zone. Measures may include permeable membrane such as geotextile fabric beneath a layer of mulch 100mm maximum and 50mm minimum or crushed rock below rumble boards as per

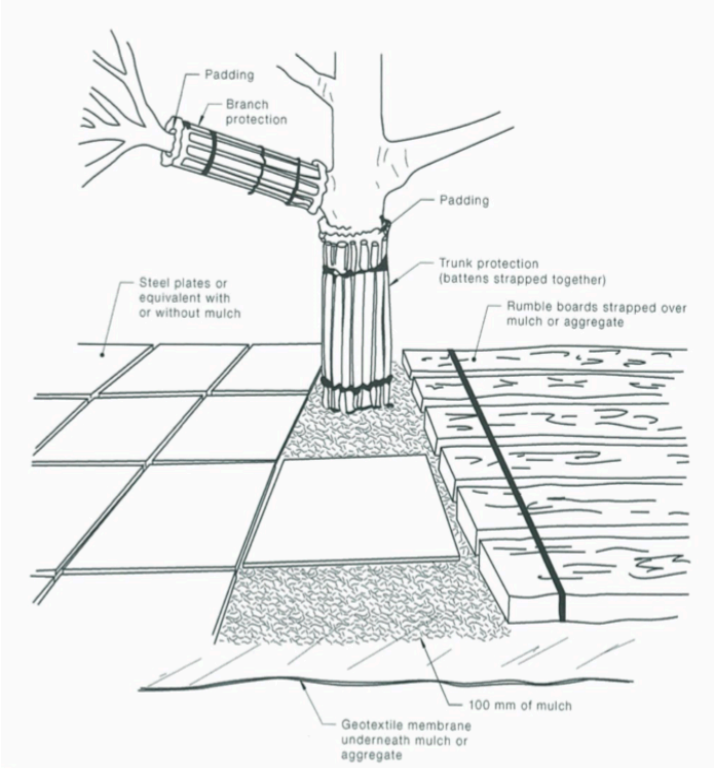
D.6 INSTALLING UNDERGROUND SERVICES WITHIN TPZ

All services should be routed outside the TPZ. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches. The directional drilling bore should be at least 600 mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees. For manual excavation trenches the project arborist should advise on roots to be retained and should monitor the works. Manual excavation may include the use of pneumatic and hydraulic tools.



D.7 TRUNK AND BRANCH PROTECTION

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



D.8 EXCAVATION REQUIRED for the insertion of supports posts for tree protection fencing should not involve the severance of any roots greater than 20mm in diameter, without the prior approval of the project arborist.

APPENDIX D.9 PROHIBITIONS

FOR TREE PROTECTION ZONES

D.10 The following activities shall not be carried out within any Tree Protection Zone:

a. Disposal of chemicals and liquids (including concrete and mortar slurry, solvents, paint, fuel or oil);
b. Stockpiling, storage or mixing of materials;
c. Refuelling, parking, storing, washing and repairing tools, equipment, machinery and vehicles;
d. Disposal of building materials and waste;

D.11 The following activities shall not be carried out within any Tree Protection Zone unless under the supervision of the Project Arborist:

a. Increasing or decreasing soil levels (including cut and fill);
b. Soil cultivation, excavation or trenching;
c. Placing offices or sheds;
d. Erection of scaffolding or hoardings; and/or
e. Any other act that may adversely affect the vitality or structural condition of the tree.

D.12 All work undertaken within or above a Tree Protection Zone shall be supervised by the Project Arborist.

D.13 Excavation within the Tree Protection Zone of any tree to be retained shall:

a. Be undertaken using non-destructive methods (e.g. an Air-spade or by hand) to ensure no roots greater than 40mm in diameter are damaged, pruned or removed.
b. All care shall be taken to preserve and avoid damaging roots; excavation should not occur within the Structural Root Zone.

DISCLAIMER

McArdle Arboricultural Consultancy Pty Ltd does not assume responsibility for liability associated with the tree on or adjacent to this project site, their future demise and/or any damage, which may result therefrom.

McArdle Arboricultural Consultancy Pty Ltd takes care to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant can neither guarantee nor be responsible for the accuracy of information provided by others.
McArdle Arboricultural Consultancy Pty Ltd cannot be held responsible for any consequences as a result of work carried out outside specifications, not in compliance with Australian Standards or by inappropriately qualified staff.

Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale.

LIMITS OF OBSERVATION

McArdle Arboricultural Consultancy Pty Ltd makes every effort to accurately identify current tree health and safety issues. Results may or may not correlate to actual tree structural integrity. There are many factors that may contribute to limb or total tree failure. Not all these symptoms are visible. There can be hidden defects that may result in a failure even though it would seem that other, more obvious defects would be the likely cause of failure. All standing trees have an element of unpredictable risk.

Consulting Arborist
Jim McArdle

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