



TREETALK

ARBORICULTURAL CONSULTING

ABN 36 323 568 677

Arboricultural Impact Assessment
Wentworthville Public School
70 - 100 Fullagar Rd
Wentworthville

Project No 5230/D2
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Prepared for

C/- Fulton Trotter Architects
Level 3, 35 Spring Street
Bondi Junction

John Kennedy
Architectural Project Manager
johnk@fultontrotter.com.au
johnw@fultontrotter.com.au

By Consulting Arborist
Sue Wylie *AQF Level 5*

Sue Wylie *AAust. AAUK ISA*
TreeTalk Arboricultural Consulting
46 Beaconsfield Pde Lindfield 2070
reports@treetalk.com.au
P 02 9416 6607 M 0417 022 692

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Arboricultural Impact Assessment: Wentworthville Public School

1.0 Summary

Trees at Wentworthville Public School have been considered in relation to extensive works proposed within the school grounds. New buildings are proposed on the site and temporary buildings are to be installed in the interim. Temporary works include the installation of demountable buildings to accommodate the school community during the works processes.

This report provides an assessment of the larger site trees and then considers tree protection and management measures required during the temporary and permanent works proposed.

Over 79 trees or tree groups were considered. Fifty-four of the larger and healthy trees are to be retained and protected within works proposed. Of the 25 trees proposed for removal, 12 are in poor health or poor structural condition with limited futures. Thirteen trees in good health, that will be adversely impacted upon by building works are proposed for removal.

Trees and tree groups and species are discussed in terms of future longevity and beneficial outcome. Some trees close to works will require that specific on - site arboricultural management be undertaken with the project arborist present to manage intrusions and protection of roots and canopy during specific processes. This is noted in the Tree protection table in Appendix E and diagrammatically on Appendix A4.

Tree protection measures are provided for each of the works proposed. This includes protection of, particularly the soil, where demountables are to be located and protection of tree growing area during the building works.

Specific tree protection measures are discussed in Sections 6 and 7 with specific and general protection measures given in Sections 8 of the report.

2.0 Background

TreeTalk Arboricultural Consulting has been engaged by the project architects Fulton Trotter to assess trees likely to be impacted upon by works proposed. The school is to be extensively enlarged to accommodate a greater number of children and this will require temporary location of demountable buildings during works processes.

Areas of the school previous with low usage, will now be high usage areas and the trees must be considered in terms of increased risk to people and temporary buildings.

Plans of proposed works are copied into Appendices A2 and A3.

The aims of this report are:

To satisfy the requirements of the consenting authorities by providing arboricultural data on the trees - including their species, dimensions, health, structural condition and viability.

To provide information on constraints, set-backs and tree protection measures necessary during site works for trees being retained.

To provide information to the architects, other consultants and project and site managers, on the constraints presented by the trees, and necessary management measures required to retain each tree in a healthy and viable condition.

3.0 Method

Consulting arborist Sue Wylie and an assistant visited the site, on 12th and 29th June 2018, to assess the site and trees, and consider the likely impact by the works proposed.

The trees were assessed by the Visual Tree Assessment (VTA) method as described in Mattheck & Breloer (1994)¹, using non-invasive tools such as binoculars and acoustic mallet.

The VTA was performed from the ground considering overall *health* and vitality, including percentage of canopy, epicormic growth, deadwood and predation by pests and diseases, and *Structural condition*. Consideration was given to faults such as *Bark Inclusion*, poor branch attachment and mechanical or biological damage and also in some cases, Useful Life Expectancy.

Neither internal probing of living tree tissue nor aerial inspection by climbing was undertaken for most trees - with the exception of one tree which was climbed on 29th June to investigate cavities and habitat in the central branches.

Health and condition was rated as *Good, Fair or Poor* (see Glossary), based on assessment at the time of inspection. This report notes any evidence that is found outside normal tree development. Tree height was estimated, and where relevant the orientation of the canopy is given. The trunk diameter was estimated at breast height 1.4 metres (DBH) and/or above root buttress (arb.).

The Tree Protection Zone (TPZ)² and Structural Root Zone (SRZ)³ has been arrived at using widely recognised methods as detailed in *Australian Standard AS 4970– 2009* (see Appendix B2).

¹ Mattheck, Claus; Breloer, Helge (1994) *The Body Language of Trees: A Handbook for Failure Analysis - Research for Amenity Trees No 4*, Pub. Forestry Commission, London.

² Tree Protection Zone: TPZ = an area around a tree with radius of 12 x DBH.

³ Structural Root Zone: SRZ = $64(D \times 50)^{0.42}$. As per Australian Standard AS 4970 – 2009, *Protection of Trees on Development Sites*.

4.0 The Site and Tree Location

The site is on relatively flat land surrounded by streets on all sides, and comprises school buildings and a range of school facilities and landscaping improvements.

The original brick buildings and older vegetation is located on the eastern third of the land and newer buildings and demountables are located in the central section.

Older trees are primarily on-site boundaries, some of which are species that would not be considered for planting today due to their weedy nature. These are the Camphor laurels (on the south-eastern corner) and Coral Trees (on the south and west). Additionally, in the case of *Erythrina* (Coral trees) structural strength is lost as they age.

There are no trees on adjacent land likely to be impacted upon by works proposed. There are several street trees on the northern and eastern streets and no trees on the western and southern streets—(see aerial views of site below)



Image 1: Aerial view of site
from maps.six.nsw.gov.au



Image 2: Aerial view of site
1943 from maps.six.nsw.gov.au

5.0 Findings

Site Trees

Larger site trees have been assessed individually and results are given in Appendix F *Tree Data Schedule*.

The history of the growing conditions of many of the trees is not clear. Soil compaction (in areas of high usage - with no surfacing or mulching) will account for some tree stresses. Where some buildings are located - and in the case of the eastern trees - which should be more vigorously healthy - the soil has large quantities of fill and rubble (as per brief viewing or geotechnical report testing) which is detrimental to health.

Boundary Trees: Western side near Garfield Street

Lopping of these trees is unfortunate as the wires adjacent are Aerial Bundle Cables (ABC) and required clearances are reduced.



Image 3 & 4: Tree 16 in good condition

5.0 Findings (continued)

Site Trees

Boundary Trees North: near Fullagar Street

Trees along this boundary are variable and the most significant trees are the native species in the Yandina area west of buildings and those nearer Station Street. Other younger trees vary in health and species (see images below).

Trees near the corner of Station and Fullagar Street near the school sign, provide a significant canopy and are generally in *Good* health and condition. Understorey planting has been achieved to some degree with Bottle Brushes in garden beds.



Image 5 & 6: Good canopy trees near corner of Fullagar and Station Streets

Boundary Trees East: near Station Street

Trees along this boundary are mostly smaller attractive exotics. These trees can be managed, however, are in primarily *Fair* health and it is assumed that this is a reflection of past works (see Section on Soil). Trees along Station Street provide an attractive screen from this very busy street and replication and soil improvement for planting success is advised.

5.0 Findings (continued)

Boundary Trees: South near Monash Street

Trees along this boundary are mostly weedy exotic species in *Good – Fair* health and condition. These trees can be managed in the short-term. Tree nearer Garfield Street are very tall natives. See individual discussion of these trees.

Trees near the corner of Fullagar and Street are primarily *Erythrina* species and the retained trees must be managed. This is to ensure that weaknesses in the wood, as the trees ages are addressed before they potentially create risk. Inter- planting with longer-lived trees and shrubs is advised.



Image 7: Trees in ecologically significant area

Similarly, trees along Monash Street must be managed and future planting considered as (with the exception of the south-western corner) all species are weedy *Erythrina* or Camphor laurels.

Other Trees of Significance

The group of trees in the north-eastern corner near Station

Street roundabout provide a good canopy. Isolation and protection of these tree is advised. This is recommended also for the boundary tree along Fullagar Road.

5.0 Findings (continued)

5.2 Street Trees

Street trees are all Brush Box species and those along Station Street are well established and in generally good condition. Similarly, a tree on Fullagar Street near Station Street. This tree has been *gully pruned* (see image) and is successfully surrounding wires while providing adequate clearance of power lines.

The one tree (Tree A) centrally located (near the administration area) is in only *Fair to Poor* condition and is unlikely to improve. It's replacement (with a more suitable species) is recommended to provide screening between the roadway and buildings where there is no opportunity for planting on site.



Image 8: Good canopy of trees near corner of Fullagar and Station Street



Image 9: Brush box street trees and Jacarandas near Station street

5.0 Findings (continued)

Summary of Findings

Removals:

Twenty-four trees are proposed for removal. These are Trees numbered 5, 6, 7, 8, 9, 10, 11, 12, 22, 30, 31, 35, 38, 39, 40, 41, 50, 53, 54, 55, 57, 59, 61, 64, 65.

Twelve of these trees are in either in *Poor* health or *Poor* structural condition or not significant (some weedy species) 9, 10, 11, 12, 22, 30, 31, 35, 50, 59, 61 and 65 (see Appendix F for detail of health and condition).

Thirteen trees proposed for removal are in *Good* – Fair health and condition, however, these will be adversely impacted upon by site works. This includes trees 5, 6, 7, 8, 38, 39, 40, 41, 53, 54, 55, 57 and 64.

Pruning:

Clearance pruning will be required to perform some works near trees and these have been noted in Table E. Some other pruning may be required for works processes and where this is the case the project arborist should be advised, and works performed to AS4373 (Appendix D)

Management:

Management of works near some trees particularly Tree 33 (and nearby trees) and Tree 54.

6.0 Discussion of Assessment

Background in assessment

Trees can be assessed in two separate and apparently contradictory ways. These are summarised as health and condition.

Tree Health

A tree's *health* (and vitality) depends upon its growing conditions and limiting factors such as access to water and air particularly in their root systems. Prolonged stress in the form of drought i.e. limited water availability - or lack of air e.g. soil compaction, will severely impact on a tree's Health. It will only survive in the short-term while using stored sugars.

A tree can be resilient, and overcome periods of decline where these conditions change or are remediated. A tree can re-establish and improve in health and vigour as smaller roots are regenerated.

Tree Condition

A tree's *Condition* (and structural stability) is important in its ability to stay upright and be of sound structural condition. This is important both above and below-ground and particularly to the root crown (base of trunk).

Above-ground structural *Condition* can often be managed by removing or managing weak attachments - such as formative pruning - remove '*included bark*' or crossed or poorly formed branches.

Below-ground condition of a tree is less accessible for assessment and consideration of site history is one of the only guides. This is the primary reason for *setting back* works near a tree. (i.e. outside SRZ). Where concerns such as this arise, root mapping can be undertaken to better understand the tree's below-ground conditions and root strength.

A tree can have good health and vitality and be structurally unsound and requiring removal. On the other hand, a tree can be structurally sound and not living (e.g. large dead trees still standing) until decay affects the wood strength.

6.0 Discussion of Assessment (continued)

These two factors are the primary considerations in the assessment of trees near works proposed. Firstly, consider the health and stability and secondly, to consider the likely impact of proposed works. Appendix F – *Tree Data Schedule*, provides the initial assessment of *Health and Condition*.

Appendix E – *Tree Protection Calculations*, provides theoretical *set-backs* for works near trees. An intrusion of 10% of TPZ area is acceptable if managed. Intrusion into the Structural Root Zone, is likely to affect tree stability and therefore increasing risk to nearby property and people.

In some cases, this can be managed on site during works with discussion between the site manager and the project arborist.

Intrusions into the TPZ greater than 10% has been carefully considered in conjunction with the architects to arrive at a manageable outcome. These areas require careful on-site management and are notated on the tree protection plan (Appendix A4) and highlighted in blue. This particularly applies to all the trees in the Yandina area, as identifying specific trees (including those for removal) is difficult due to the closeness of the canopies.

7.0 Discussion of Tree Groups

Eucalypts

Many locally endemic trees are growing on the site e.g. *Eucalyptus moluccana* (Grey Box, Gum-topped box), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus paniculata* (Grey Ironbark) and *Eucalyptus punctata* (Grey Gum).



Image 10: Nest in Tree 1

Brush Box

Lophostemon, is a very hardy species (see street trees along Station Street) unless lopped under powerlines (as Tree A - central Fullagar Street). The smaller watergums are now the preferred tree.

Casuarina

Casuarina and Allocasuarina are prominent along Fullagar street. Most of these trees require removal to accommodate works however these tree species are evidently highly successful on the site and provide fast growing screen trees they should be replicated in areas requiring fast and effective screens.



Image 11: Parakeets in Casuarinas along Fullagar Road

7.0 Discussion of Tree Groups (continued)

Yandina Area



Images 12-14: Yandina Area

An area of note is the Yandina (aboriginal element) near Fullagar Road and west of buildings. This is considered to be of importance to the school community and includes a good selection of native trees and an attractive serpentine timber walkway structure. The trees in this area are closely planted and represent a relatively healthy selection (with some notable exceptions) despite heavy compaction.

One feature tree is the Bunya Pine in the centre of the Yandina area. This tree is an attractive member of the ancient Araucaria group such as the Wollemi Pine. It is a relatively young tree and as it matures and begins to form fruit, it must be monitored to ensure that developing cones are removed. These large fruits are heavy and fall from considerable heights.

Building works and landscaping features are near these trees and specific arboricultural site management will be required.



7.0 Discussion of Tree Groups (continued)

Weedy Species

Camphor Laurel

The group of Camphor Laurel (Trees 72 – 76) along the eastern section near Monash Street are in *Fair* health and *Fair* condition and can be retained. However, these trees are unlikely to improve significantly in health. If this becomes a high activity area, they should be managed to remove dead wood. When replaced it should be with a similarly large and significant species such as Brush Box, Casuarina or Allocasuarina or another suitable Cumberland Plain Woodland canopy trees.



Image 15: Camphor Laurels along Monash Street

Coral Trees are planted along the western boundary near Garfield Street and the southern boundary near Monash Street. These trees, while colourful and generally attractive when vigorous, they are readily affected by decay fungi and lose structural strength as they age.

Although the trees on this site are generally in *Good* health (for *Erythrina* species) These trees should be closely monitored and any deadwood removed immediately.

These trees can be readily replaced with some more suitable species (e.g. see Yandina area or consider other colourful species suitable or clay soils).



Image 16: North eastern corner of site

7.0 Discussion

Future Planting

These trees have adapted to the local conditions and soil, and are an excellent species for replacement planting - as are other eucalypts of the Cumberland plain selection. Particularly attractive tree species are the Ironbark's with black trunks, grey foliage and pink (gumnut baby) flowers.

Locally Endemic Shrubs are primarily located in the central garden area, which was an earlier principal's project.

Most trees and shrubs in this area have been neglected and are either dead or in decline and the area is primary dominated by self-seeded weedy plants. Species such as these (see understorey plating in Ecological report) is advised for other areas and understorey planting which is beneficial to the tree health and survival of taller trees by protection the soil area.

This area is proposed for redevelopment and is in the building platform. Generally, there is no understorey planting in other areas.

Discussion of Soil

The entire site is very dry and the soil should be considered carefully to ensure the success of replacement planting. The Station Street area trees appear particularly and unexpectedly with low vigour. The most likely explanation for this was revealed upon viewing the has been noted in the geotechnical report.

As noted in the assessment of the geotechnical report, the soil along Station Street is



Image 17: Exotics near Station Street

'fill/rubble' and accounts for the poor growth of the trees along the boundary.

I highly recommend that this soil be tested and remediated by an organisation such as SESL (I do not know how long this process takes) to improve the soil for the existing trees (e.g. Jacarandas which will not be replaced) and for the health of further planting.

7.0 Discussion – Habitat Trees

Habitat Trees and Areas of Ecological Significance

Nearby trees are semi-mature. They and are predominantly *Eucalyptus moluccana* and other endemic species. These have been accommodated within the design process. Some branches/trunks leaning on demountable buildings require management. Soil has been mulched and further mulching will be beneficial. Copy of plan in Image below.



Image 18: Map of habitat tree locations as numbered and ecologically significant area in green



Images 19 & 20: Locally endemic trees in *quiet area* of ecological significance.
Maintenance of mulch will be beneficial

7.0 Discussion – Habitat Trees (continued)

Habitat Trees

HT1 is a *Eucalyptus punctata* (Grey Gum) Tree 34 in the TT table, in the *Yandina* area where the canopy of many trees is beneficial for birds and other fauna. Many birds were observed within the canopy of these trees most of which are to be retained and protected.

As this is a high usage area, the larger dead trees must be managed for risk which will require the removal of two tall Tallowwoods (Trees 30 and 31) with high percentages of deadwood and limited futures.



Images 21 & 22: Tree 34 (Tree HT1) in the Yandina area

7.0 Discussion – Habitat Trees (continued)

Habitat Trees

(This must be performed by an experienced habitat pruner to address risk vs beneficial habitat).

HT2 is a *Eucalyptus moluccana* (Grey Box, Gum-topped Box) Tree 13 in the TT table in the south-western section of site.

It has centrally dead branches which provide a large area for habitat.

This deadwood is an ideal habitat. Nesting pairs of Galahs were observed (see Image 23).

As the tree will now be in a high usage area, it was climbed to assess structural strength of dead central branches and found to be in *Good Condition*. It is contained within the central section of the tree and is not adversely impacting upon the tree's structural strength.

Habitat pruning is advised when the young birds have moved on. Some careful pruning of older wood will limit chances of dead wood falling.

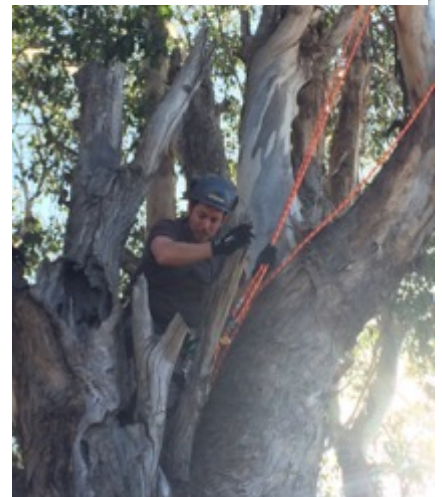


Image 23: Nesting pair of Galahs inspecting nest site

Some careful pruning is advised to minimise risk while retaining habitat benefits, see Pruning section.

It is near two other locally endemic trees on the south west boundary.

Image 24: Arborist inspecting habitat tree wood for management



7.0 Discussion – Habitat Trees (continued)

Habitat Trees 13 – 16 in ecologically sensitive area.



Images 25- 27: Endemic trees along Monash Street in ecologically significant area

7.0 Discussion – Habitat Trees (continued)

Habitat Trees

HT3 a *Eucalyptus tereticornis* (Forest Red Gum) Tree 5 in the TT schedule, near the car parking area. It is a locally endemic tree and appears to have been present prior to the school establishment (as noted evident in 1943 - See NSW6maps Image 2).

This tree has a long and unknown history of intrusions into its root growing area, which are currently impacted upon by bitumen in the adjacent car park, paving and demountable classrooms to the north.

The tree canopy also has an unknown history which is also evident in the canopy which does not display normal branch development. Its complex branching may indicate topping (an undesirable practice) at some distant stage -- or extensive storm damage.

The tree overhangs high target areas of frequent usage (cars people pedestrians and classroom).

It is difficult to perform a definitive risk assessment. Knowledge of past works on this tree would be very useful in understanding its future.

A further assessment could be undertaken to further understand the possible risks involved. However, at this stage there are no indicators from the ground that would lead to immediate concerns. Work proposed in this area will impact on this tree, and its removal is planned.



Image 28: Tree 5 (*Habitat Tree HT3*) and younger endemic trees near entrance from Fullagar Street

7.0 Discussion – Habitat Trees (continued)

HT4 is an exotic *Schinus molle* var. *areira* (Pepper Tree) Tree 2 in the TT schedule, in the central area. This aesthetically pleasing specimen and environment with many children congregating under during inspections (see images below). Its retention and protection is planned and works are unlikely to impact on this tree. A nest was observed in the adjacent Tree 1



Images 29 - 32: Tree 2 Habitat Tree (HT4) Pepper tree in central area.

7.0 Discussion of Pruning Works Required

Yandina Area

As works are proposed near the Yandina area, branches of trees will require further assessment. Before works begin, branches that will be impacted upon by proposed works or works processes (such as scaffolding or installing demountable buildings) will require removal.

Tree 13: to accommodate installation of demountable buildings and toilet block the Tree 13 will require removal of lowest branch to the south. Also, habitat pruning is advised.

Maintenance Pruning works

Yandina Area

Fig: Pruning of the Fig is required as the lowest branch to the southwest required formative pruning to manage damage. This should be performed by a well-qualified arborist to ensure that this highly significant tree is not inadvertently damaged.

Trees along the western end of the serpentine walkway should be monitored in this high usage area. Some branches of the Coral tree should be removed, as they are dead.

Deadwood

Note: All deadwood will eventually fall and should be managed. All deadwood (3cmØ at branch junction) should be removed in high target areas. The reason for ongoing deadwood production of a tree should be established.

Consideration should be given to conflicting branches that could weaken a tree as well as branches that could limit growth of a beneficial suppressed tree.

7.0 Discussion of Tree Removal

Removal of trees with limited future in high usage areas.

Two *Eucalyptus microcorys* in the Yandina area, are in poor health with large amounts of deadwood. These trees have a limited future and with the increased usage of this area the trees should be removed.

Tree removal for works proposed

Tree 5 is currently in an area of high usage and appear to have history of disturbance in the root growing area (carpark/demountable). It has unusual branch structure in the canopy is unclear and the tree is in an area of proposed works.

Coral Trees and other trees along the south-western boundary are proposed for removal to accommodate new demountables. Few of these trees are likely to have good longevity and replacement with new planting at the completion of works is preferable.

Retention of tree 16 would be desirable if possible. It is a healthy tree in *Good* condition with a long future.

Street Tree A

This tree is outside the site and has a limited future, *Short ULE*. A request to Council for its removal and replacement is advise (see adjacent image).



Image 33: Tree A
Poorly lopped under wires - limited future.

7.0 Tree Removals

A new driveway access from Fullagar Road near special needs Building F will require the removal of 3 trees.

Trees Yandina area trees include some dead trees (30 & 31) and one tree has a limited future. It is an edge tree West of the Yandina area. Although it is structurally sound, the canopy is poorly developed, mostly epicormic and growing to the west. The tree is unlikely to establish a better crown and can be considered for removal.

Two Tallowwoods in this area are mostly dead and the reason for this is not clear. Removal is advised. Removal of completely dead trees has been advised to school principal.

Table 1 Tree Removals

Tree No.	Species	Location	Reason for Removal
5	Forest Red Gum	Car parking areas north	Within building envelope
6	Semi-mature Eucalypts	Central courtyard	Within building envelope
7 & 8	Brush Box/liquidambar	Western boundary	Limited future New demountables will impact on trees
9 - 12	African Olive Coral trees	Central west	Weedy species
22	Jacaranda	South-western area Western boundary	New demountables will impact on tree
28	Willow Gum	West of Yandina	Limited future Could be retained in the short term
30 & 31	Tallowwood	Yandina area	Dead or mostly dead/ Risk
35 & 50	Various	Northern boundary	Dead
50 & 51	River She-oaks		Level changes proposed within TPZ
38 - 41	She-oak, Gum and Jacaranda	North of administration area	Within area of proposed wheelchair access road
53, 54, 55 & 57	Various	Northern boundary	Within building envelope
59	Paperbark	North- eastern corner	Poor structural condition
61	Ash	Eastern side of buildings	Dead/ Within building envelope
64 & 65	Brush Box Crepe Myrtle	Eastern side of buildings	Within building envelope
Adjacent Tree			
A	Brush Box	Street Tree	Request removal/Short ULE

All trees on adjacent land must be protected and retained in their current condition

8.0 Likely Impact on Retained Trees

Site Preparation

The site preparation process is the initial time that trees are likely to be adversely impacted upon. Protection fencing, soil surface protection and run-off management must be in place before any other works occur (Appendix A4 and C1).

Care must be taken to isolate the trunks of trees where works are proposed within the SRZ (Appendix C2).

Temporary Demountable Installation

General Tree Protection measures are provided in the following section Sections 9.0, 9.1 and 9.2. Any level changes will adversely impact on retained trees as their roots are mostly in the top 20cm of soil.

Of note in this regard include excavation or fill within the TPZ which must be limited or specifically addressed per tree. Not so obviously is inadvertent damage in the TPZ of trees such as soil surfacing, piers for footing, landscaping features, walkways. Paving must be above existing ground level (accommodating base works not just FFL's).

Street Trees

It is assumed that access to the site for proposed works will be from streets other than Station Street as this street was very busy. Street trees (Marked on plan as B) along this street and on Fullagar Road near the Station Street roundabout will be protected by protection of retained trees on the site.

8.0 Discussion of Intrusions

T5

Intrusion into this tree is estimated to be 53% of TPZ area and will impact upon trunk. It has been highlighted in the *Travers Ecological* report as a habitat tree. Extensive plan modifications would be required to retain this tree. If the tree is to be retained it must be carefully monitored annually.

Modifications have been undertaken to accommodate the following trees.

Table 2: Modified Tree Protection Distances⁴

Tree No.	Species	SRZ Radius	Action	TPZ Radius (On one side only)
T13	Gum	3.0m	<u>All works within reduced TPZ or SRZ must be supervised by project arborist</u> Manage and isolate trunk & foliage and all soil within SRZ. (See Appendices C1 and C2)	3.0m (works side only) (9m on other sides)
'Yandina' T33 and nearby trees	Native species	2.0m	<u>All works within reduced TPZ or SRZ must be supervised by project arborist</u> Manage and isolate trunk & foliage and all soil within SRZ. (See Appendices C1 and C2)	2.0m (works side only) (3.6m on other sides)

Do not enter or perform works within SRZ without your arborist onsite or with specific information provided.

⁴ As per AS 4970: Australian Standard AS 4970 – 2009 *Protection of trees on development sites*.

8.1 General Protection for Retained Trees

Tree protection measures for tree/s being retained will include isolating each to the extent of TPZ/works **before any other works begin**. And maintaining the soil area in its existing condition until the landscaping phase (see Appendices A4 and C1).

Both above and below-ground sections of each tree require protection. Fence (See Appendix C1) each tree or group of trees to TPZ Where this is not possible or where works or access are required near the tree/s wrap trunk and install mulch and rumble boards (See Appendix C2) and isolate root zone as diagrammatically represented on plans in Appendix A4.

TPZ

To protect soil from compaction or contamination storage of material must be outside the TPZ.

Where access is required within the TPZ the area should be mulched and rumble boards added (as per Appendix C2). Where there are difficulties isolating tree and tree root zones from works processes, please discuss this further with your project arborist.

Engineering works must be considered by your project arborist and be outside SRZ and most of TPZ.

Surfacing and all associated works must be above existing grade- and performed with consideration of tree roots below. Do Not mechanically scour under tree/s being retained as this will detrimentally impact on roots, which are near the surface.

There must not be any level changes with TPZ by an area greater than 15% unless specific arboricultural consideration is given to the works proposed.

SRZ

Any works within SRZ requires that specific and detailed arboricultural assessment be undertaken.

Where access is required within the SRZ the trunk must be isolated/wrapped, the area mulched and rumble boards added as per Appendix C2.

Footings for works or boundary fencing within SRZ - must be of pier and beam construction and NOT strip footings.

8.2 General Tree Protection at Work Phases

Site Preparation

To ensure that adequate tree protection is in place, it is important that protection measures are the first works on site. Fence tree/s to the extent of the TPZ or to specific distances given in the report (see Table 1).

Where access is required within the TPZ, wrap trunk and protect soil within TPZ with geotextile fabric, mulch and rumble boards where fencing is not possible (this must be specifically discussed).

- Consider branches that may interfere with works process and manage or prune (See Appendix D).
- Consider where materials are to be stored and keep this outside tree protection zones.
- Protect tree from run-off from works processes, particularly materials that can change soil chemistry, as this is detrimental to trees particularly native.
- DO NOT CHANGE SOIL LEVELS within TPZ without arboricultural advice (Tree roots are usually located in the top 30cm of soil and reductions in soil level can remove most of a tree's roots. Additionally, and increases in soil can reduce available air to roots and cause them to die).

Table 2: Tree Protection at Stages of Works

Works Phase	Protection Required	Solution
Site Preparation	Protect Tree canopy, trunk and roots with clear separation from work processes.	Install tree isolation fencing as per distances given in Table 2. (Protect soil where staged works are proposed within the SRZ). Install soil surface and run-off protection for TPZ.
Site Works	Protect tree canopy, trunk and roots. Maintain soil in current condition. Protect soil and roots run off.	Maintain soil surface protection and retain fencing. Contractors should be made aware of the importance of retaining tree protection measures and avoiding damage to vegetation being retained.
Services	Maintain soil in current condition.	Install all services outside tree protection area. No excavation below existing grade without specific arboricultural advice being provided.
Landscaping	Soil and tree roots zone. Cut and Fill.	No significant level changes (no reduction in soil level unless specified. No fill over 10cm unless it is with structural soils).

Do not perform works within SRZ without your arborist on site & specific information provided.

9.0 Conclusion

Over 79 trees or tree groups have been considered. Most of the healthy, larger trees are to be retained and protected within works proposed. Although working closely with the architects to retain significant trees, a total of 30 trees are proposed for removal. Of the trees requiring removal, 13 are good trees within the areas of buildings or works processes and require removal to perform works as proposed. Twelve of the trees requiring removal are either not significant, or have limited or short Useful Life Expectancy with either health or structural concerns. Fifty-four trees are proposed for retention and protection.

Necessary protection measures, set-backs and constraints required to adequately manage all the trees being retained, are provided in this report. See Sections 6 and 7 and diagrams in Appendices A4, C1 and C3. Some careful and site specific arboricultural management is required where works are to be performed near some significant trees. This can be managed with the project arborist on site to co-ordinate, works and works processes so as to limit the impact on the trees growing area and ensure a good outcome for the specific trees.

10.0 Recommendations

To minimise the impact on the trees being retained, works must be performed as discussed in Sections 7 – Table 2, Section 8 and Section 9 of this report.

The site manager and contractors must be advised of Tree Protection requirements, and a copy of this report should be available on-site at all times. Specific and detailed work methods are required to manage any works from the lower level so that there is no impact upon trees.

The most relevant sections of the report are *Appendix A4 – Diagrammatic Tree Protection Plan*, Section 8.0 and Section 9.0 *Tree Protection Measures*.

Please contact me directly on 0417 022 692, if any sections of this report require clarification.



Sue Wylie
Principal Arboriculturist
TreeTalk Arboricultural Consulting
Diploma of Horticulture (Arboriculture)
Australian Qualification Framework (AQF5)

Age of Tree:

Young: Less than 1/3 life expectancy

Semi-mature: 1/3 to 2/3 life expectancy

Mature: Older than 2/3 life expectancy

Over-Mature /Senescent: Older than 2/3 life expectancy and showing signs of irreversible decline

Condition of Tree:

Good: Tree is generally healthy and free from and obvious signs of structural weakness or significant adverse effects of pests and diseases or infection.

Fair: Tree is generally vigorous although has some indication of being adversely affected by the early effects of disease or infection or environmental or mechanical damage. Appropriate tree maintenance can usually improve trees overall health and halt decline.

Poor: Tree in decline and is not likely to improve with reasonable maintenance practices or has a structural fault such as bark inclusion.

Dead: Tree no longer capable of sustained growth

Diameter at breast height (DBH): The nominal trunk diameter at 1.4 m above ground level

D = Ø arb = Trunk diameter, in m, measured above the root buttress

Dead Wood: Noted in tree data table **D/w**. All deadwood will eventually fall and should be removed in high target/high usage areas, as per AS4373 (Appendix D).

Development Works: Includes any physical activity in relation to land that is specified by the determining authority.

Included Bark: Patterns of development at branch junctions where bark is turned inwards rather than pushed out. – A potentially weak attachment.

Project Arborist: The person responsible for carrying out the tree assessment, report preparation, consultation with designers, specifying tree protection measures, monitoring and certification. The project arborist will be suitably experienced and competent in arboriculture, having acquired through training, qualification (minimum Australian Qualification Framework (AQF) Level 5, Diploma of Horticulture (Arboriculture)) and/or equivalent experience, the knowledge and skills enabling that person to perform the tasks required by this Standard.

Structural root zone (SRZ): The area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres. This zone considers a tree's structural stability only, not the root zone required for a tree's vigour and long-term viability, which will usually be a much larger area.

Tree: Long-lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority).

Tree Protection Zone (TPZ): A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

TMO/TPO Tree Management Order/ Tree Preservation Order – Legislation (usually part of Local Environment Plan (LEP) directing management of trees and vegetation).

ULE: Useful Life Expectancy (after Barrell) (see table in Appendix).

Vigour: Ability of a tree to sustain its life processes. The term 'vigour' in this document is synonymous with commonly used terms such as 'health' and 'vitality'.

¹ Australian Standard 4970-2009: *Protection of trees on development sites* Licensed to Ms Sue Wylie

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Harris R.W., Clark, J.R., Matheny N., (2004) *Arboriculture – Integrated Management of Landscape Trees, Shrubs and Vines*. Pub. Prentice Hall, New Jersey USA

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Smiley, Thomas E; Matheny, Nelda; Lilly, Sharon (2011!) *Best Management Practices – Tree Risk Assessment*. The International Society of Arboriculture (ISA).

Standards Australia (2007) Australian Standard AS4373-2007 *Pruning of Amenity Trees*, Pub. Standards Australia, Sydney.

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Site Specific

<http://www.wentworthvil-p.schools.nsw.edu.au/>

<http://www.wentworthvil-p.schools.nsw.edu.au/gallery/yandina>

http://www.wentworthvil-p.schools.nsw.edu.au/cmsresources/wentworthville-public-school/misc/2017/8/newsletter_term_3_week_3_1501675520818.pdf

<https://trove.nla.gov.au/work/6833066?q=subject%3A%22Wentworthville+Public+School+--+History.%22&c=book&versionId=78667627068WW01> Travers Ecology 171221 A17204 Fullagar Road Wentworthville BAR Report.pdf

Useful References

Planting

[http://hort.ifas.ufl.edu/woody/documents/RPG%20Tree%20Planting%20Cue%20Card\[1\].pdf](http://hort.ifas.ufl.edu/woody/documents/RPG%20Tree%20Planting%20Cue%20Card[1].pdf)

<http://www.mortonarb.org/trees-plants/tree-and-plant-advice/horticulture-care/how-plant-trees>

Tree Benefits

<http://www.mortonarb.org/trees-plants/benefits-trees/sources-benefits-trees>

www.treesaregood.com/treeowner/treeownerinformation.aspx

www.treesaregood.com/treecare/resources/WhyToppingHurts.pdf

www.treesaregood.com/treecare/resources/New_TreePlanting.pdf

<http://www.naturewithin.info/>

www.greenhealth.washington.edu

http://www.isa-arbor.sk/dokumenty/Tree_stability_%20Engels_Peter%20Sterken.pdf

<http://hort.ifas.ufl.edu/woody/>

Trees are dynamic living structures, growing and adapting to conditions around them. A Tree's condition will change and vary over time depending on weather, environmental factors and mechanical or human interaction. Assessment is limited to the conditions at the time of the inspection and only trees discussed in the report have been assessed. Plans used to assess likely impact are those appended (Appendix A).

Ongoing monitoring of all nearby trees is advised and where significant changes are observed, further advice should be requested. Unusual developments or sudden changes in a tree's condition should be addressed immediately.

There should be **NO changes within the Structural Root Zone (SRZ)** of a tree without specific arboricultural advice and supervision being provided from an experienced AQF Level 5 arborist.

This also applies to underground utilities and services such as plumbing/gas/drainage and can also apply to landscaping works such as paving below existing grade and fill greater than 10cm above grade.

Photographs are inserted as a guide to matters discussed however these could be misleading and may exaggerate or minimise the elements under discussion. The text should be the main guide to the importance of images and diagrammatic representation on plans.

This report is primarily about tree protection measures as they relate to the works proposed (as given in the attached plans) and does not necessarily address tree maintenance or tree management works required.

The report is to be considered in its entirety and where unclear clarification should be sought.

Appendix A1

Tree Location

Tree Numbers added to Site Survey by LandPartners Limited, Drawing No: SY074362-SV1, Dated 21/12/2017



Appendix A2i

Tree Removal/Retention Plan

Plan by Fulton Trotter Architects, Project No:7068WV01, Dwg No: SD-1609/Rev:P6, Dwg No: SD-1609, Dated 7/02/2019

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TREE PLAN LEGEND

TREE TO BE RETAINED  123

TREE TO BE DEMOLISHED  123

CONSTRUCTION AREA 

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Plan by Fulton Trotter Architects, Project No: 768WV01, Dwg No:SD-1001/Rev P8, Level 3, Dated 05/10/18

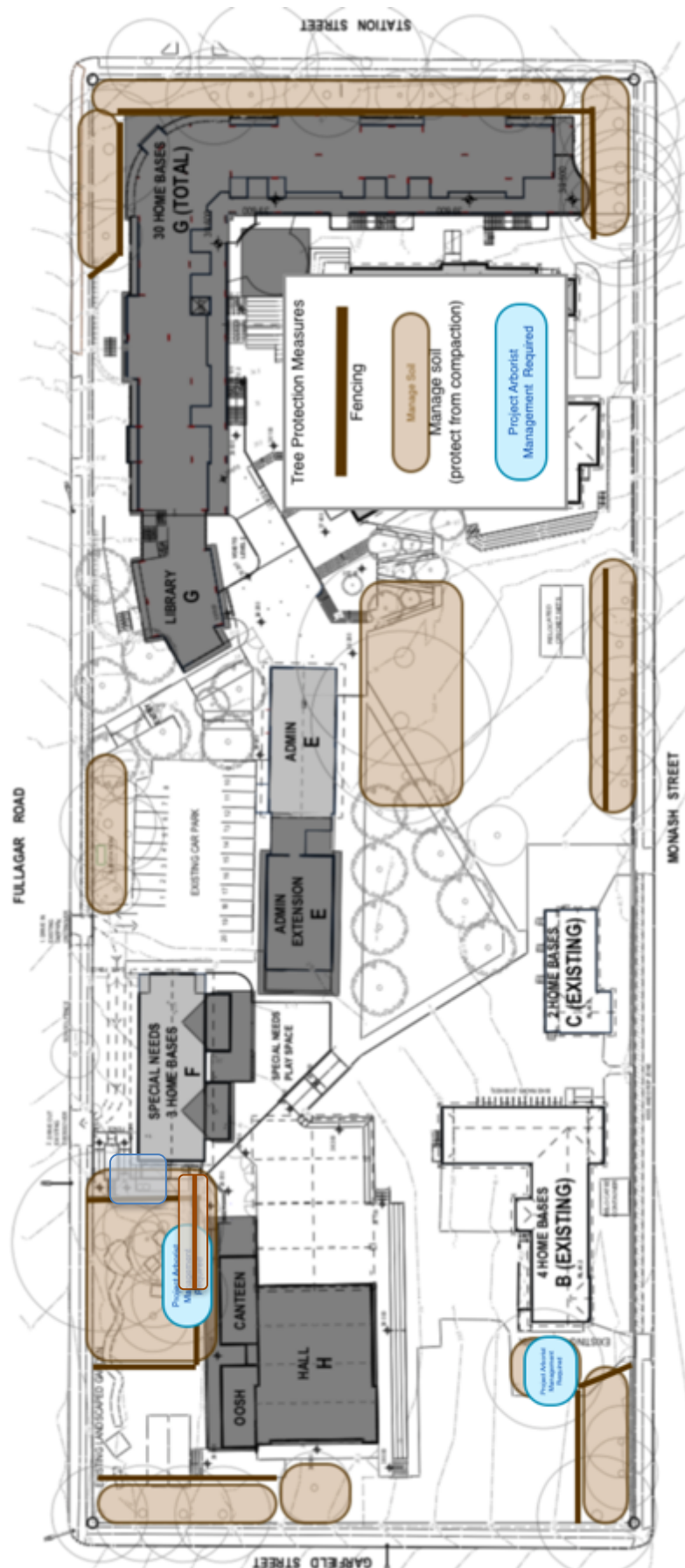


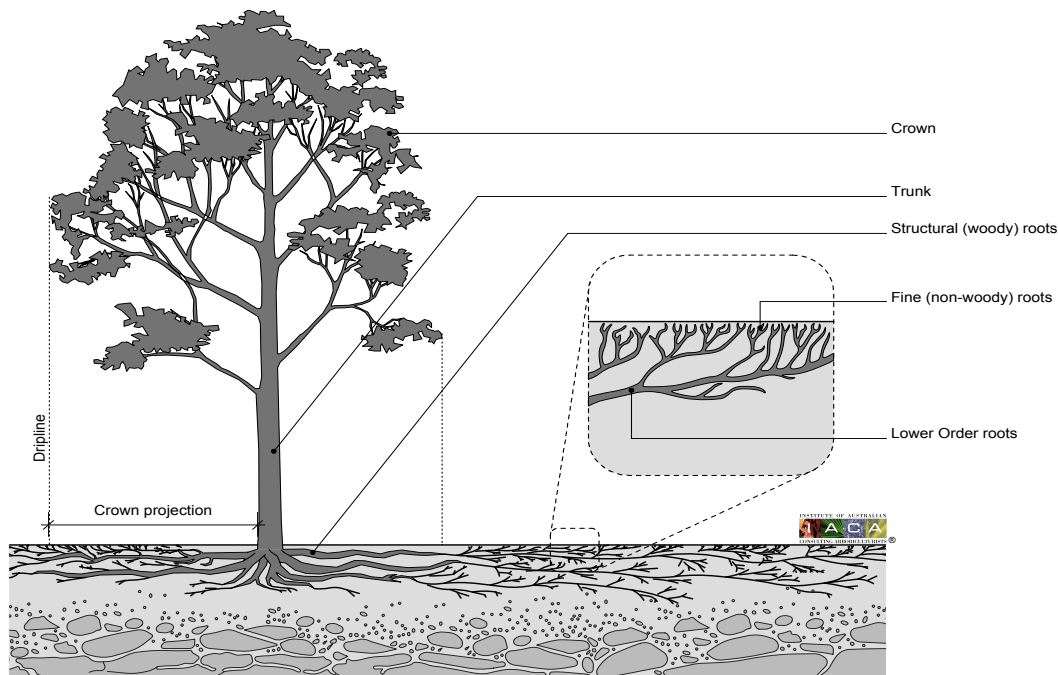
Appendix A4

Diagrammatic Tree Protection Plan

Over enlargement of Fulton Trotter Architects, Project No: 768WV01, Dwg No:SD-1001/Rev P8, Level 3, Dated 05/10/18

Note: Distances should be as per TPZ provided in Appendix E or as certified on site by project arborist



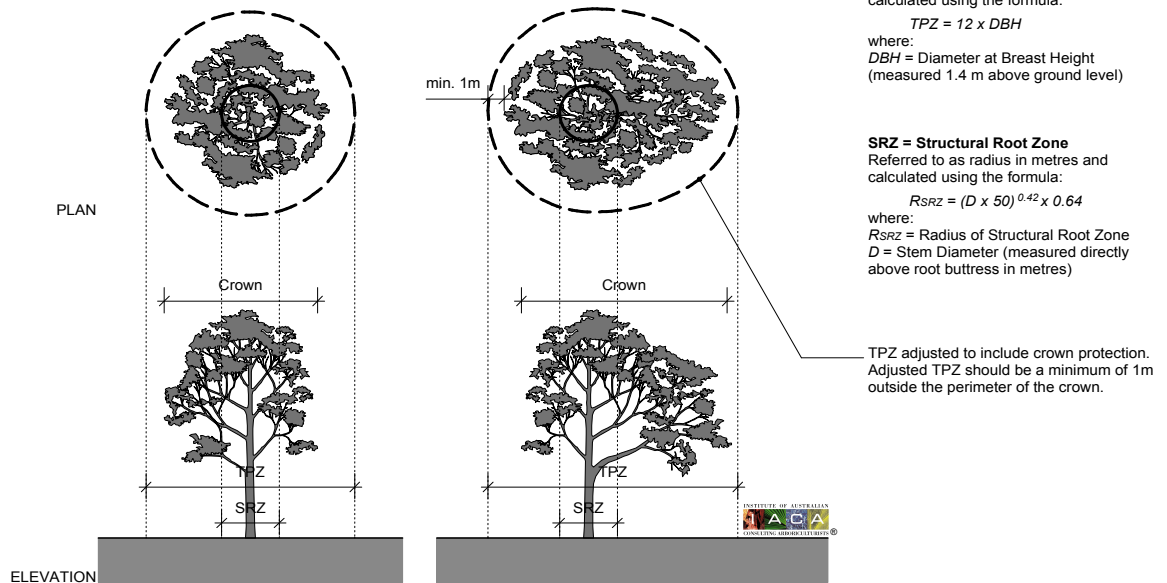


Structure of a Tree in a Typical Growing Environment

Scale 1:200 @ A4

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- Most tree roots are in the top 30cm of soil and are easily damaged by compaction and the loss of air spaces necessary for healthy survival. Soil compaction is a common cause of tree decline on development sites.
- Protection of tree roots requires that all activity be managed (and preferably eliminated) within the Tree Protection Zone) with fencing (i.e. 12 times trunk diameter or as otherwise specified in the report).
- Roots fall into two main categories:
 - **Structural woody/Critical roots (SRZ):** These roots are instrumental in tree anchorage and structural support, nutrient storage and nutrient transport.
 - **The fine/smaller non-woody roots (TPZ)** are important in water and nutrient absorption as well as other functions important to tree health and survival.
- During site works demolition teams, builders and other workers on site will gravitate towards these green shady "different" areas, unaware of the damage they can cause, by compacting or contaminating the soil.
- Damaged trees are a liability and ongoing expense.
- Existing vegetation, particularly trees, are valuable assets that can continue to contribute to the property value long after new works have been completed.
- If well managed and protected trees provide an amenity to the immediate area and an environmental benefit to the wider community.



Indicative Tree Protection Zone (TPZ)

Scale 1:500 @ A4
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The theoretical Tree Protection Zones (TPZ) of trees being retained, are given in the appended Tree Protection Calculations section of the report (Appendix E).

Works within the area of small roots Tree Protection Zone (TPZ)

- Minimising soil compaction, by isolating most of the TPZ from works is important in the early stages of site works. Heavy equipment (such as those used in the demolition and the site preparation process) passing over the roots (or materials stockpiling) is detrimental to both the tree as well as the soil proposed for future plant growth (later landscaping).
- If works are proposed within the TPZ by and area of greater than 10%,

Works within Structural Root Zone SRZ

- Where works are required near large roots i.e. those within the SRZ, it is essential to avoid damaging these roots that are providing tree anchorage. Failure to do so is likely to create a dangerous tree that could fall.
- All works within SRZ should be above ground and to specific arboricultural specifications (provided by your AQF Level 5 arborist and preferably with them on site).
- Consideration may be required such as root mapping (careful exploratory digging using hand tools) to locate any large roots - 3cm or greater in diameter) and to find suitable locations. Piers for pier and beam construction are the only work possible.
- Piers must avoid roots with 20 – 30mm plus diameters.

*"The Tree Protection Zone is the area around the tree or group of trees in which no grading or construction activity may occur. This area should be large enough to retain sufficient root or crown area to maintain tree health and stability."*⁵

⁵ Harris, Clark Matheny (2004)

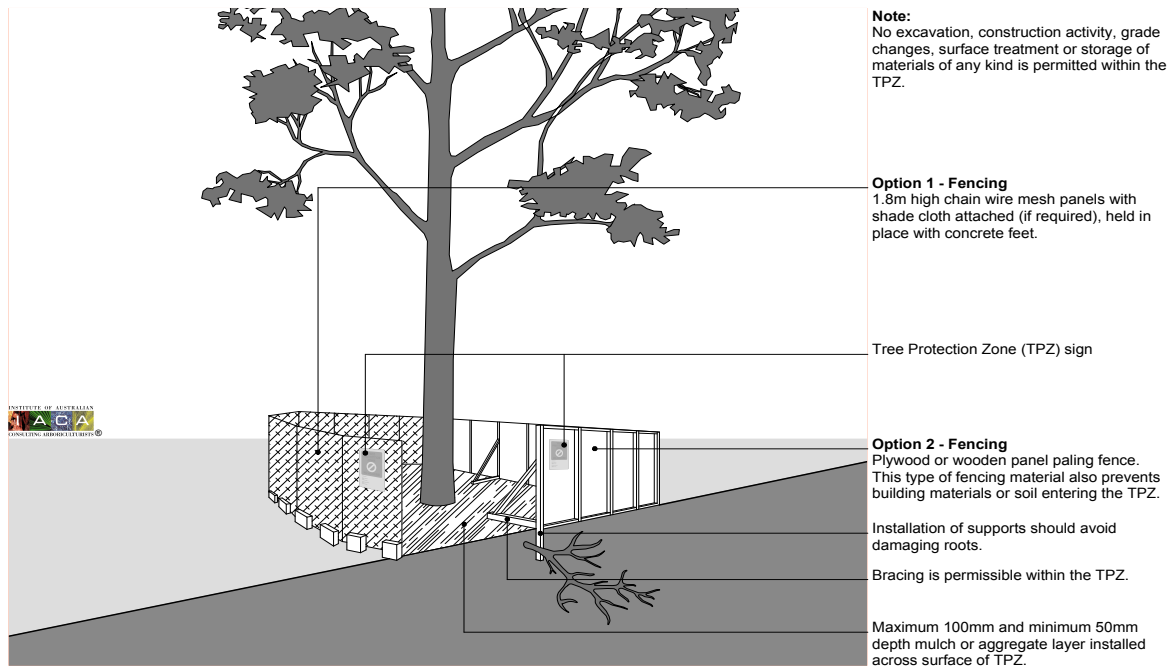
Appendix B3

Useful Life Expectancy* (ULE)

Condition Rating

	1 Long ULE	2 Medium ULE	3 Short ULE	4 Remove	5 Small Young or Regularly clipped
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 - 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 - 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years	Trees that can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.	Small trees less than 5m high.
B	Trees that could be made suitable for long-term retention by remedial tree care.	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.	Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.	Dangerous trees because of instability or recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in high.
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings.	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings.	Damaged trees because of structural defects including cavities, decay, included bark, wounds or poor form.	Formal hedges and trees intended for regular pruning to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new plantings.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	

(after Barrell SULE**)



Tree Protection Fencing

Not to Scale

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Tree Protection should be the first works on site: Protecting trees and vegetation being retained by isolating it with fencing is easier and far less expensive than later replacement or re-establishment.

Exclusion of Activity Inside the TPZ

- Each tree to be retained should be fenced off to the extent of the Tree Protection Zone excluding all activity unless otherwise indicated in the report. The fencing is to exclude storage of materials, site sheds, machinery, run off (e.g. concrete, or chemical treatments), the movement of pedestrian or vehicular traffic, the temporary, location of services, e.g. trenches, pits or canals.
- No works should be performed within the fenced area without specific consideration given. This includes mechanical scouring of existing vegetation and changes of soil levels (either the addition or removal).
- Where access is required adjacent to a tree e.g. along a driveway trunks and branches will require protection (see Appendix C2).

FENCING

- For large significant trees** fencing should be 1.8m in height of cyclone chainmesh Hire from - temporary fencing companies or similar. Other vegetation can be isolated using star pickets and orange parra-webbing. Available at local hardware outlets

Site Signage on the fencing reminds workers of specific reasons for the fencing – for example:

'This fencing is not to be moved'.

'This Tree Protection Zone is to isolate vegetation from the building process'.

No equipment or materials are to enter or be stored within the fenced area and no chemicals or run off enter this protected zone.

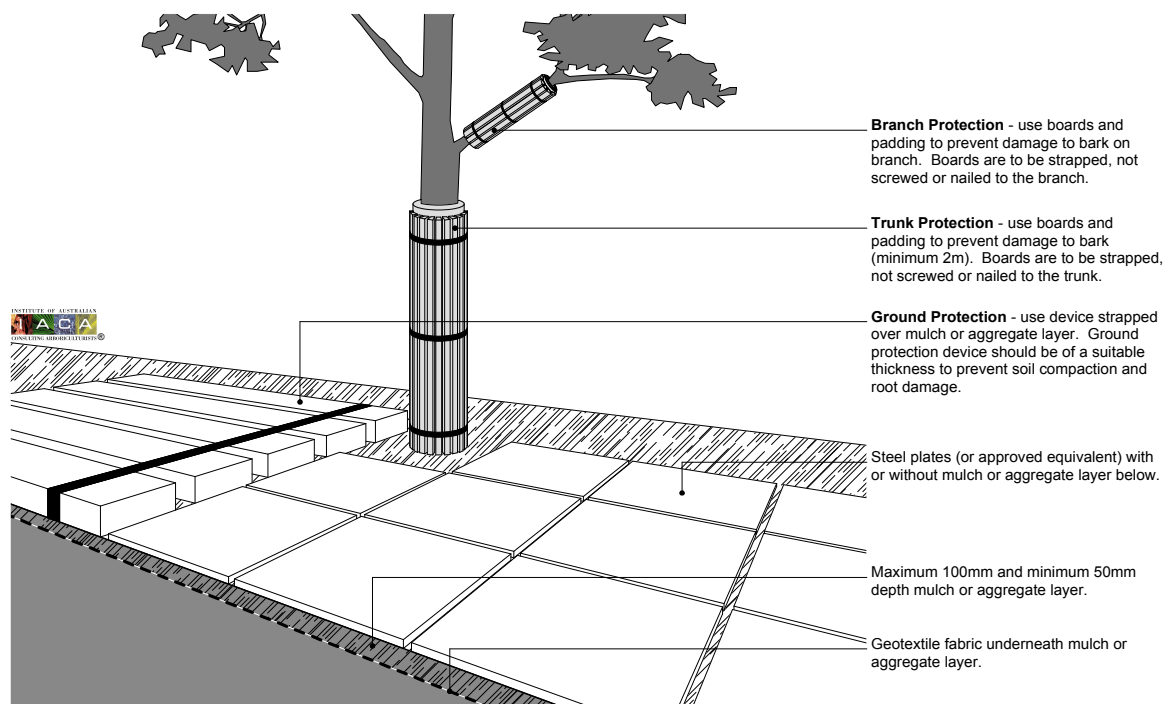
Should fencing need to be moved for any reason first contact ...Site Manager on 9999 9999 or Arborist on 0417 022 692'.

Appendix C2

Trunk / Branch Wrapping & Soil Protection

Tree Protection Measures as per AS 4970

Based on IACA Members licence of AS4970-2009



Examples of Branch, Trunk and Ground Protection

Not to Scale

Copyright © 2010 IACA

WORKS CLOSE TO A TREE

Trunk Protection

Where a tree trunk is likely to be knocked (e.g. site access along a driveway) it must be protected from possible damage. Protection material may be hessian, carpet, underfelt (or similar breathable material) with timber planks attached with wire or rope, encircling the materials (not into trunk). Protection material should cover from the base of the tree to 2m (or to a level that is likely to be damaged by passing equipment) branch protection may be required.

Where access or works within TPZ are required soil surface protection must be installed i.e. a platform (constructed of steel material or timber/rumble boards capable of supporting and distributing the weight over a layer of mulch) and geotextile fabric (see diagram above).

Branch & Foliage Protection

To accommodate works some pruning might be required.

All pruning should be performed by a Qualified Tree Surgeon to ensure pruning is to AS 4373- 1996 'Australian Standards for Pruning Amenity Trees, see Appendix D). (If greater than 10% council approval may be necessary).

MULCH

Mulch is a blanket of insulating material that helps maintain soil moisture reduces the effects of temperature fluctuation and assists in weed reduction. Organic mulch is preferable as it also improves soil condition. Mulch such as Eucalyptus Wood mulch is ideal for use on development sites and should be placed to a depth of 70-100mm within the Tree Protection Zone or drip zone. The area immediately around the trunk should be kept clear of mulch to ensure no moisture builds up at the base of the trunk. It is also a barrier used in exceptional circumstances to assist with reducing soil compaction with vehicular access.

As poor pruning practices can create dangerous trees, introduce disease and cause trees to decline in health, all tree works recommended in this report should comply with the **Australian Standard for Pruning of Amenity Trees AS4373-2007**, and be performed by a suitably qualified and experienced tree surgeon, preferably with membership of a recognised organisation e.g. Arboriculture Australia (AA), Tree Contractors Association (TCA).

Tree works by unqualified, inexperienced or well-meaning cutters who do not perform works to AS 4373 can lead to many long-term and detrimental effects on the tree.

Tree Safety concerns include:

- Topping, lopping and structural root removals (roots >3cm in diameter) are inappropriate tree works, likely to create hazardous trees.
- Excessive pruning can lead to inappropriate growth such as the development of epicormic shoots. Epicormic shoots are emergency growth to provide short-term nutrient supply and are rarely strongly attached to branches or trunks. These branches are likely to fall as they become heavier.
- Removal of deadwood in Urban Trees is necessary in high traffic areas as part of the maintenance regime. Excessive deadwood production needs investigation.

Tree Health concerns include:

- Disease can be introduced onto a site or be transferred between trees by unclean equipment. **All equipment used should be cleaned before use and between trees with either 10% bleach 90% water or 70 % Metho 30% water.**
- Where a tree is suspected of being diseased the wood should be disposed of with care and not used for mulch.
- Poorly maintained equipment such as unsharpened blades, promotes jagged or poor cuts, leading to unnecessary stress and greater chance of disease entry and insect attack.
- Cutting to inappropriate points along a branch (known as lopping) encourages weakly attached regrowth that is likely to fail.
- The trees' natural defence and protection systems can be weakened by inappropriate cutting.

Considerations Before Pruning

Trees do not in themselves require pruning. A tree will naturally optimize its use of light (foliage) and space (particularly roots). When we interfere with this process by removing live foliage we interrupt or reduce the tree's ability to photosynthesise and produce the sugars required for health and vigour. Where we cut branches, the tree must use stored sugars to manage the cut surface with defences to insect and disease.

Trees in the urban area require management to fit in with our requirements. Removal of deadwood as well as diseased and damaged wood are normal maintenance procedures to limit the impact on us. Removal of live wood (stored sugars) and foliage must be kept to a minimum.

From AS4373 - *The tree should not be adversely affected by pruning.*

Prior to pruning being prescribed or undertaken a thorough inspection of the tree should be carried out by a person competent in arboricultural assessment (minimum AQF Level 3). This should include an assessment of the tree's health, growth habit, structure, stability and growing environment. The need for pruning should be determined. If pruning is required, then the current and subsequent pruning requirements should be specified. Clause 7 covers types of pruning.

Good tree management: Pruning is creating minimal adverse effects on the tree.

Pruning is defined as considered cutting to branch collars (the location of many tree defences) without damaging the collar (e.g. flush cutting).

Poor Inappropriate Tree works include: Indiscriminate cutting often leading to poorly attached re-growth that is likely to fail.

E.g. **Lopping** – Random cutting at a point between branch unions (i.e. not to branch collars). This practice usually damages a tree reducing strength condition and vigour and promoting premature decline and exposure to pests and diseases.

Topping - Height reduction, Removal of the upper part of a tree reducing its height by Lopping and **Flush cutting** – removal of or damage to branch collar.

For your protection **Choose a Professional Tree surgeon who:**

- Conducts their business according to The Code of Practice for The Amenity Tree Industry.
- Performs works to Australian Standard for Pruning of Amenity Trees, 4373–1996
- Carries CURRENT Public Liability Insurance – Check currency certificate.
- Is a member of a recognised, professional organisation such as: Tree Contractors Association (TCA) or Arboriculture Australia (AA). Membership of these organisations requires that works be performed to appropriate standards. These members are monitored for compliance.

About the **Code of Practice for the Amenity Tree Industry 1998**

'This code has been developed as TREE WORK IS HAZARDOUS. The industry is full of hazards ranging from the tree itself, to the weather, the terrain and difficult sites in which tree work is carried out. Each year, many people in the tree industry are killed or injured. Apart from the enormous impact of injury on individuals and their families, accidents cost the community a significant amount of money. The relatively high incidence of injuries is reflected in the high rates for workers' compensation insurance premiums. When injuries are analysed, the overwhelming majority could have been prevented by following the simple safety procedures outlined in this Code of Practice'. (Quote from the code)

This code provides practical guidance on safety requirements for the amenity tree industry. It is intended as a guide to the public and private sectors in meeting their requirements under the Occupational Health and Safety Act 1983. This code applies to the amenity tree industry for pruning, trimming, repairing, maintaining, transplanting and removing trees and for wood chipping, stump grinding and for equipment used in such operations.

About the Australian Standard: Pruning of Amenity⁶ Trees 4373–2007

This document outlines 'best practice' methods of tree work, written for compliance by arborists. Your chosen tree contractor must be familiar with and perform all works according to the standard.

⁶ The AS4373 is for Amenity trees and does not relate to trees in Commercial production.

Appendix E

WWPS Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
1	Forest Red Gum	100cm 140cm arb	28m ²	3.0m	N/a	10m	N/a	
2	Peppercorn Tree	100cm	28m ²	3.0m	N/a	10m	N/a	
3	Jacaranda	35cm	55m ²	2.0m	N/a	4m	N/a	
4	Weeping Cypress	35cm	55m ²	2.0m	N/a	4m	Site works	
5	Forest Red Gum	100cm	28m ²	3.0m	Site works	10m	Site works	Within building envelope
6	Semi-mature eucalypts	10 - 25cm	18m ²	1.6m	N/a	2.4m	Site works	Careful management of area.
7	Brush Box	55cm	137m ²	2.7m	N/a	6.6m	N/a	Within building envelope
8	Liquidambar	35cm	55m ²	2.0m	N/a	4m	N/a	Within building envelope
9	African Olive	30cm	13m ²	2.0m	N/a	3.6m	N/a	Remove weedy species
10	African Olive	2 x 25cm	55m ²	2.0m	N/a	4m	N/a	Remove weedy species

Red = Remove

Blue = Detailed Consideration required

Appendix E

WWPS Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
11	Coral tree	55cm	137m ²	2.7m	Building envelope	6.6m	Building envelope	
12	Coral tree	40cm	72m ²	2.3m	Building envelope	4.8m	Building envelope	
13	Grey Gum	75cm	255m ²	3.0m	Manage	9m	Manage	Habitat Tree Pruning for habitat and one limb south for demountable installation Protect and fence during demountable installation
14	Grey Box	40cm	72m ²	2.3m	Manage	4.8m	Manage	Isolated group. Protect and fence during demountable installation
15	Forest Red Gum	45cm	92m ²	2.5m	Manage	5.4m	Manage	Isolated group. Protect and fence during demountable installation
16	Lemon-scented Gum	40cm	72m ²	2.3m	Manage	4.8m		Retain if possible

Red = Remove

Blue = Detailed Consideration required

Appendix E

WWPS Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
22	Jacaranda	45cm	92m ²	2.5m	Building envelope	5.4m	Building envelope	
23	Crimson Bottlebrush	30cm	13m ²	2.0m	Site works	3.6m	Site works	Isolated from site works with fencing.
24	Coral tree	35cm	55m ²	2.0m	Site works	4m	Site works	Isolated from site works with fencing.
25	Coral tree	40cm	72m ²	2.3m	Site works	4.8m	Site works	Isolated group from site works with fencing. Monitor and manage as tree ages
26	Coral tree	40cm	72m ²	2.3m	Site works	4.8m	Site works	Isolated group from site works with fencing. Monitor and manage as tree ages
27	Coral tree	50cm	113m ²	2.6m	Site works	6.0m	Site works	Isolated group from site works with fencing. Monitor and manage as tree ages
28	Willow Gum	30cm	13m ²	2.0m	Site works	3.6m	Site works	Isolated group from site works with fencing.
29	Sydney Blue Gum	45cm	92m ²	2.5m	Site works	5.4m	Site works	Isolated group from site works with fencing.
30	Tallowwood	35cm	55m ²	2.0m	Site works	4m	Site works Note	Remove due to risk On-site identification will be required due to the proximity of trees being retained
30A	Bunya Pine	35cm	55m ²	2.0m	Site works	4m	Site works	Isolated group from site works with fencing. Monitor fruit development as tree ages

Red = Remove

Blue = Detailed Consideration required

Appendix E

WWPS Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
31	Tallowwood	25cm	28m ²	2.0m	N/a	3.0m	N/a Note	Remove due to risk On-site identification will be required due to the proximity of trees being retained
32	Lemon-scented Gum	76cm	255m ²	3.0m	Site works	9m	Site works	Isolated from site works with fencing. Manage installation of walkways.
33	Lemon-scented Gum	30cm	13m ²	2.0m	Site works	3.6m	Site works	Specific on-site management will be required with project arborist on site. Isolated group from site works with fencing.
33a	Grey Ironbark	30cm	13m ²	2.0m	Site works	3.6m	Site works	Isolated from site works with fencing. Manage installation of walkways.
34	Grey Gum	70cm	222m ²	3.0m	Site works	8.0m	Site works	Isolated from site works with fencing. Manage installation of walkways.
35	Dead Gum	N/a	-	-	-	-	-	Remove
36	Turpentine	30cm	13m ²	2.0m	Site works	3.6m	Site works	Isolated group from site works with fencing. Manage installation of walkways.
37	Moreton Bay Fig	80cm	290m ²	3.0m	Site works	9.6m	Site works	Isolated group from site works with fencing. Manage installation of walkways.
38	River She-oak	70cm	222m ²	3.0m	Building envelope	8.0m	Building envelope	New driveway – special needs access
39	Swamp Mahogany	30cm	13m ²	2.0m	Building envelope	3.6m	Building envelope	New driveway – special needs access
40	Jacaranda	42cm	79m ²	3.0m	Building envelope	5.0m	Building envelope	New driveway – special needs access

Red = Remove

Blue = Detailed Consideration required

Appendix E

WWPS Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
41	Grey Box	20cm	18m ²	1.8m	Building envelope	2.4m	Building envelope	Widened driveway – special needs access
42	Grey Box	20cm	18m ²	1.8m	Site works	2.4m	Site works	Isolated group from site works with fencing.
43	Grey Box	30cm	13m ²	2.0m	Site works	3.6m	Site works	Isolated group from site works with fencing.
44	Bottlebrush	40cm	72m ²	2.3m	Site works	4.8m	Site works	Isolated group from site works with fencing.
45	Paperbark	55cm	137m ²	2.7m	Site works	6.6m	Site works	Isolated group from site works with fencing.
46	Brush Box	70cm	222m ²	3.0m	Site works	8.4m	Site works	Isolated group from site works with fencing.
47	Gum	20cm	18m ²	1.8m	Site works	2.4m	Site works	Isolated group from site works with fencing.
48	Gum	25cm	28m ²	2.0m	Site works	3.0m	Site works	Isolated group from site works with fencing.
49	Gum	20cm	18m ²	1.8m	Site works	2.4m	Site works	Isolated group from site works with fencing.
50	Dead Wattle	-	-	-	-	-	-	Remove

Red = Remove

Blue = Detailed Consideration required

Appendix E

WWPS Tree Protection Calculations as per AS 4970 - 2009

	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
51	River She-oak	65cm	26m ²	2.9m	Site works	7.8m	Site works	Level changes proposed within TPZ
52	2 x She-oak	50cm	113m ²	2.6m	Site works	6.0m	Site works	Level changes proposed within TPZ
53	Bottlebrush	28cm	36m ²	2.0m		3.4m	Building envelope	Major (47%) Intrusion by works
54	Brush Box	82cm	300m ²	3.2m	Site works	10.0m	Site works	
55	She-oak	45cm	55m ²	2.0m		4m	Building envelope	Major Intrusion by works
56	Tallowwood	60cm	72m ²	2.3m	Site works	4.8m	Site works	Isolated from site works with fencing.
57	Chinese Elm	40cm	13m ²	2.0m	Building envelope	3.6m	Building envelope	Major Intrusion by works
58	Spotted Gum	50cm	113m ²	2.6m	Site works	6.0m	Site works	Isolated from site works with fencing.
59	Paperbark	30cm	13m ²	2.0m	N/a	3.6m	N/a	Tree in Poor structural condition
60	Jacaranda	49cm	110m ²	2.6m	Site works	5.9m	Site works	18% intrusion Isolated from site works with fencing.

Red = Remove

Blue = Detailed Consideration required

Appendix E

Wentworthville Public School

Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
61	European Ash	30cm	28m ²	1.5m	Building envelope	3.0m	Building envelope	Major Intrusion by works
62	Jacaranda	50cm	113m ²	2.6m	Site works	6.0m	Site works 14% Intrusion	Isolated from site works with fencing.
63	2 x Jacaranda	25cm	28m ²	2.0m	Site works	3.0m	Site works 4% Intrusion	Isolated from site works with fencing.
64	Brush Box	50cm	113m ²	2.6m	Building envelope	6.0m	Building envelope	Major Intrusion by works
65	Crepe Myrtle	Multi	21m ²	1.9m	Building envelope	3.0m	Building envelope	Major Intrusion by works
66	Jacaranda	20cm	18m ²	1.8m	Site works	2.4m	Site works	Isolated from site works with fencing.
67	Crepe Myrtle	20cm	18m ²	1.8m	Site works	2.4m	Site works	If retained - Isolated from site works with fencing.
68	European Ash	20cm	18m ²	1.8m	Site works	2.4m	Site works	Consider replacement in landscaping plan
69	Brush Box	15cm	13m ²	1.7m	Site works	2.0m	Site works	Isolated from site works with fencing.
70	Crepe Myrtle	Multi	21m ²	1.9m	Site works	3.0m	Site works	If it is tree is to be retained, levels near this tree must be managed to ensure that there are no works below existing grade within 1.5m of the street.

Red = Remove

Blue = Detailed Consideration required

Appendix E

Wentworthville Public School

Tree Protection Calculations as per AS 4970 - 2009

Tree No.	Species	DBH cm	Tree Protection Area	SRZ Radius	Intrusion into SRZ	TPZ Radius	Intrusion into TPZ Area	Works nearby/Tree Protection Measures
71	Jacaranda	18cm	15m ²	1.8m	Site works	2.0m	Site works	Isolated from site works with fencing.
72	Camphor Laurel	43cm	85m ²	2.4m	Site works	5.2m	Site works	Isolated from site works with fencing.
73	Camphor Laurel	50cm	113m ²	2.6m	Site access	6.0m	Site access	Isolated from site works with fencing.
74	Camphor Laurel	43cm	85m ²	2.4m	Site works	5.2m	Site works	Isolated from site works with fencing.
75	Camphor Laurel	55cm	137m ²	2.7m	Site works	6.6m	Site works	Isolated from site works with fencing.
76	Camphor Laurel	70cm	222m ²	3.0m	Site access	8.0m	Site access	Isolated from site works with fencing.
77- 81	Coral trees	50cm	113m ²	2.6m	Site works	6.0m	Site access	Isolated from site works with fencing.

Red = Remove

Blue = Detailed Consideration required

Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #		DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Note
1	<i>Eucalyptus tereticornis</i> Forest Red Gum	100cm 140cm arb.	17m	Good	Fair	Co-dom @4m D/w to 5cmØ – Remove Deadwood Cockatoo damage at branch union. Nest in tree	
2	<i>Schinus molle</i> var. <i>areira</i> Peppercorn Tree	100cm	9m	Good	Fair	Minor D/w. High % epicormic growth	Noted as Habitat Tree HT4 in Eco report
3	<i>Jacaranda mimosifolia</i> Jacaranda	35cm	8m	Fair	Good/Fair	Poor pruning evident	
4	<i>Cupressus funebris</i> (Chinese Weeping Cypress)	35cm	8m	Fair	Fair	Previous branch failures	
5	<i>Eucalyptus tereticornis</i> Forest Red Gum	100cm	16m	Good	Fair	Co-dom (possibly topped at 4m) Bitumen surrounding	Noted as Habitat Tree HT3 in Eco report
6	Selection of semi-mature Eucalypts	10 - 25cm	8m	Good/Fair	Fair	<i>Eucalyptus moluccana</i> (Grey Box, Gum-topped box) SM - Formative pruning required to remove branch/trunk – rubbing against classroom gutter. 'Quiet Area'.	Considered important in Eco report
7	<i>Lophostemon confertus</i> Brush Box	55cm	9m	Fair	Good		
8	<i>Liquidamber styraciflua</i> Liquidambar	35cm	7m	Fair- Poor	Fair		
9	<i>Olea europaea</i> subsp. <i>Cuspidate</i> African Olive	30cm	7m	Good	Fair	Weedy species. Epicormic from base	
10	<i>Olea europaea</i> subsp. <i>Cuspidate</i> African Olive	2 x 25cm	6m	Good	Good	Weedy species. Co-dom - included	

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove Risk: Failure: Imminent / Probable (Possible Improbable)
Target: High / Medium (Low/Very Low) Consequences of Failure: Severe/ Significant (Minor/ Negligible)

Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Note
11	<i>Erythrina x sykesii</i> Coral tree	55cm	7m	Good	Fair	Hanger in tree	
12	<i>Erythrina x sykesii</i> Coral tree	40cm	7m	Good	Fair	D/w and dead stubs	
13	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	130cm	16m	Good	Good - Fair	Climb advised	Noted as Habitat Tree HT2 in Eco report
14	<i>Eucalyptus tereticornis</i> Forest Red Gum	70cm	20m	Good	Fair	Lopped along Monash street for wire clearance. D/w and dead stubs Storm damaged hanger need removal	Storm damaged hanger needs removal
15	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	55cm	20m	Good	Fair	Lopped along Monash street for wire clearance.	
16	<i>Corymbia (Euc) citriodora</i> Lemon-scented Gum	55cm	14m	Good	Good	Corner tree	
17-21	Trees no-longer present						
22	<i>Jacaranda mimosifolia</i> Jacaranda	45cm	7m	Good	Fair	Western boundary Epicormic from line clearance	
23	<i>Callistemon citrinus</i> Crimson Bottlebrush	30cm	6m	Good	Fair	Western boundary/w needs removal Multiple trunk injury/damage	
24	<i>Erythrina x sykesii</i> Coral tree	35cm	8m	Good	Fair	Western boundary	

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove Risk: Failure: Imminent / Probable (Possible Improbable)
 Target: High / Medium (Low/Very Low) Consequences of Failure: Severe/ Significant (Minor/ Negligible)

Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Health	Structure	Comments / Risk	Note
25	<i>Erythrina x sykesii</i> Coral tree	40cm	8m	Good	Fair	Western boundary	
26	<i>Erythrina x sykesii</i> Coral tree	40cm	8m	Good	Fair		
27	<i>Erythrina x sykesii</i> Coral tree	50cm	8m	Good	Fair	D/w and manage branches near cricket pitch	
28	<i>Eucalyptus scoparia</i> Willow Gum	30cm	11m	Fair	Fair	Leaning west, edge tree with limited foliage. Yandina area	
29	<i>Eucalyptus saligna</i> Sydney Blue Gum	45cm	17m	Good	Fair	D/w. live-wood at base/borer! Yandina area. Manage and monitor.	
30	<i>Eucalyptus microcorys</i> Tallowwood	35cm	15m	Good	Fair- Poor	D/w Yandina area. Remove tree with limited future.	
30A	<i>Araucaria bidwillii</i> Bunya Pine	35cm	13m	Good	Fair	D/w. Yandina area. Remove fruit/cones annually when mature.	
31	<i>Eucalyptus microcorys</i> Tallowwood	25cm	8m	Good	Good	Yandina area Remove limited future. Remove tree with limited future.	
32	<i>Corymbia (Euc) citriodora</i> Lemon-scented Gum	76cm	18m	Good	Good	Leaning south. Yandina area	
33	<i>Corymbia (Euc) citriodora</i> Lemon-scented Gum	30cm	14m	Good	Good	Yandina area. Nest in tree.	
33a	<i>Eucalyptus paniculata</i> Grey Ironbark	40cm	13m	Fair	Fair	Large D/w 12cm Ø. Yandina area	

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove Risk: Failure: Imminent / Probable (Possible Improbable)
Target: High / Medium (Low/Very Low) Consequences of Failure: Severe/ Significant (Minor/ Negligible)

Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Note
34	<i>Eucalyptus punctata</i> Grey Gum	70cm	17m	Good	Fair	Large diameter D/w. Yandina area	
35	<i>Dead Eucalyptus</i> (Gum)	17cm	-	-	-	Remove ASAP Yandina area. Principal advised.	
36	<i>Syncarpia glomulifera</i> Turpentine	30cm	11m	Good	Fair	Formative prune to remove one of Co-dom's ASAP Yandina area	
37	<i>Ficus macrophylla</i> Moreton Bay Fig	80cm	16m	Good	Good	Damage on South 1 st order branch. Remove branch. Yandina area	
38	<i>Casuarina cunninghamiana</i> River She-oak	70cm	15m	Good - Fair	Good	D/w to 8cm diameter. Witches broom affecting foliage.	
39	<i>Eucalyptus robusta</i> Swamp Mahogany	30cm	7m	Good	Fair	Prune lower branches away from building	
40	<i>Jacaranda mimosifolia</i> Jacaranda	30 + 30cm	7m	Good	Good		
41	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	20cm	7m	Good	Good		
42	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	20cm	7m	Good	Good		
43	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	30cm	9m	Good	Fair	Borer activity	
44	<i>Callistemon citrinus sp</i> Crimson Bottlebrush	40cm	6m	Good	Fair	D/w	

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove Risk: Failure: Imminent / Probable (Possible Improbable)
Target: High / Medium (Low/Very Low) Consequences of Failure: Severe/ Significant (Minor/ Negligible)

Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Note
45	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	55cm	9m	Good	Fair	D/w, Co-dom/included	
46	<i>Lophostemon confertus</i> Brush Box	5 x 20- 40cm	9m	Fair	Fair	D/w, poor earlier pruning	
47	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	20cm	8m	Good	Good	Semi- mature. Minor D/w	
48	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	25cm	8m	Good	Good	Semi- mature. Minor D/w	
49	<i>Eucalyptus moluccana</i> Grey Box, Gum-topped Box	20cm	7m	Good	Good	Semi- mature. Minor D/w	
50	<i>Acacia</i> sp. Wattle	15cm	4m	Dead	Dead	Remove. Principal advised.	
51	<i>Casuarina cunninghamiana</i> River She-oak	65cm	17m	Good	Good	Inclusions/Co'dom.	
52	2 x <i>Casuarina cunninghamiana</i> River She-oak	2 x 30 + 40cm	15m	Good	Fair	Inclusions/Co'dom.	
53	<i>Callistemon citrinus</i> Crimson Bottlebrush	2 x 20cm	5m	Good	Good		
54	<i>Lophostemon confertus</i> Brush Box	2 x 40 + 60cm	11m	Good	Good		

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove Risk: Failure: Imminent / Probable (Possible Improbable)
Target: High / Medium (Low/Very Low) Consequences of Failure: Severe/ Significant (Minor/ Negligible)

Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Note
55	<i>Allocasuarina torulosa</i> Forest Oak	45cm	15m	Good	Fair	Included from 5m	
56	<i>Eucalyptus microcorys</i> Tallowood	60cm	17m	Good	Good	D/w removal required	
57	<i>Ulmus parvifolia</i> Chinese Elm	30cm	12m	Good	Good	Minor D/w. buttressing and girdling at base.	
58	<i>Corymbia (Euc) maculata</i> Spotted Gum	80cm	17m	Good	Good	D/w removal required. Co-dom Good angle of attachment. Garden of Bottlebrush under.	
59	<i>Melaleuca sp</i> Paperbark	30cm	12m	Fair	Poor	Previous large failure. Other inclusions likely to fail Remove!	
60	<i>Jacaranda mimosifolia</i> Jacaranda	35cm	10m	Fair	Good- Fair	D/w removal required. Bottlebrush below.	
61	<i>Fraxinus excelsior</i> European Ash	30cm	7m	Fair	Poor	>20cm dead stems borer.	
62	<i>Jacaranda mimosifolia</i> Jacaranda	50cm	8m	Good	Fair		
63	2 x <i>Jacaranda mimosifolia</i> Jacaranda	20-25cm	6 - 7m	Fair	Fair		
64	<i>Lophostemon confertus</i> Brush Box	50cm	9m	Good	Good		

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove Risk: Failure: Imminent / Probable (Possible Improbable)
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Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Note
65	<i>Lagerstroemia indica</i> Crepe Myrtle	25 + 30cm	5m	Fair	Fair	Decay & D/w	
66	<i>Jacaranda mimosifolia</i> Jacaranda	20cm	5m	Good	Good		
67	<i>Lagerstroemia indica</i> Crepe Myrtle	20cm	5m	Good	Good		
68	<i>Fraxinus excelsior</i> European Ash	20cm	5m	Fair	Fair	Dead stems. Maintenance prune or consider replacement in new landscaping.	
69	<i>Lophostemon confertus</i> Brush Box	10+ 10cm	4m	Good	Good		
70	<i>Lagerstroemia indica</i> Crepe Myrtle	7 x 10cm	4m	Good	Good		
71	<i>Jacaranda mimosifolia</i> Jacaranda	10 + 15cm	4m	Good	Good	D/w	
72	<i>Cinnamomum camphora</i> Camphor Laurel	3 x 25cm	10m	Fair	Fair	D/w	
73	<i>Cinnamomum camphora</i> Camphor Laurel	4 x 25cm	11m	Fair	Fair	D/w	
74	<i>Cinnamomum camphora</i> Camphor Laurel	2 x 25cm	11m	Fair	Fair	D/w	

Health/Structure: Good Fair Poor Crown Class: Dominant, Co-dominant, Intermediate, Suppressed ULE Long Medium Short Remove Risk: Failure: Imminent / Probable (Possible Improbable)
Target: High / Medium (Low/Very Low) Consequences of Failure: Severe/ Significant (Minor/ Negligible)

Appendix F

Wentworthville Public School

Tree Data Schedule

Tree #	Species	DBH/ Ø arb	Height x Spread	Heath	Structure	Comments / Risk	Works required
75	<i>Cinnamomum camphora</i> Camphor Laurel	55cm	11m	Fair	Fair	D/w	
76	<i>Cinnamomum camphora</i> Camphor Laurel	70cm	11m	Fair	Fair	D/w	
77-81	5 x <i>Erythrina x sykesii</i> Coral tree	40 -60cm	8m	Good	Good	Generally, appear sound ...for Coral trees!	
	Central native garden Eucalypt hybrid, and native grasses.	various	<2m	Fair - Poor	Fair - Poor	Most in decline with additional and dominant self-seeded weedy species. Good understorey species for replication elsewhere.	

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