



Arboriculture Assessment & Management Statement

for lodged Development Application (2019/0625)

August 2019

Site: Lot 55 in DP 36616
12 Akora Street
FRENCHS FOREST, NSW

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1 Summary

D & S Ryan (as the property owners) have commissioned *Aura Tree Services Pty Ltd* to prepare an "Arboriculture Assessment & Management Statement–Tree Management Strategy" to be linked to the as lodged Development Application (2019/0625) for Alterations & Additions to a dwelling house including swimming pool.

The site is within the *Northern Beaches Council* (from herein *NBC*) local government area.

NBC is the sole consent authority for the as lodged DA submission.

Relative to tree management this document focuses on two (2) individual third property trees & mentions trees within property known as 12 Akora Street, Frenchs Forest (from herein the subject site). The discussed in detail trees are within the properties 10 Akora Street & 25 Karinal Crescent. Both trees within the third-party properties are the same species, *Brachychiton acerifolius* (*Illawarra Flame Tree*)

It is our opinion that all trees (mentioned, not discussed) within the subject site are exempt from protection by *NBC 'Tree Management Provisions'*, i.e. *Warringah Council Development Control Plan, 2011* & the *State Environmental Planning Policy (SEPP), 'Vegetation in Non Rural Areas, 25 August 2017*.

The site is not listed within the *NBC (old Warringah Council) 'Local Environment Plan, 2011'* (from herein *LEP*) as being part of any 'Heritage Conservation Area'. Neither the subject site/adjoining common boundary sites are listed as 'Heritage Items'. No trees discussed are species within any-endangered ecological community. (See Part 3 of Schedule 1 within the *Threatened Species Conservation Act*.) The discussed trees are not listed within any known "significant tree register".

From a *Local Government Tree Management* perspective, no discussed trees are subject to the provisions within the *NBC (old Warringah Council) 'Development Control Plan, 2011'* (from herein *DCP*) & the *SEPP 'Vegetation in Non-Rural Areas, 25 August 2017'*. However, the two (2) discussed trees within adjoining common boundary sites as third-party property are treated/discussed as protected trees.

This document supports the as lodged DA submission based on information supplied by our client provided the two (2) third party property tree owners agree to them being replaced. This document acknowledges the provisions within the *Australian Standard (AS4970–2009 Protection of trees on development sites)*.

This scope of this document includes:

- *NBC DA Tracking webtool for as lodged documents & communications from NBC,*
- *general site & tree assessment,*
- *tree's condition assessment (i.e. present condition & Useful Life Expectancy),*
- *perusal of as lodged Architectural Plans/Elevations by Angela Ellis Design, drawings #1, 4, 5, 6 & 11, dated 24 May 2019,*
- *Site Survey by Total Surveying Land & Property Surveyors, dated April 2018 &*
- *provision of a "Site Specific Plan of Management".*

Kyle Hill, Practicing & Consulting Arborist AQF Level 5 & 8, has prepared this document based on onsite inspection (Thursday, 8 August 2019).

TABLE OF CONTENTS

1	Summary	2
2	Introduction.....	4
3	Methodology	5
4.1	The Site	6
4.2	The Proposal	9
4.3	The Trees	12
5	Discussion	14
6	Site Specific 'Tree Plan of Management'	14
	(if Tree #1 & Tree #2 are to be retained).....	14
7	Recommendations:.....	17
8	Limitations on the use of this report	18
9	Assumptions.....	18
10	Recommended References	18
11	Selected Bibliography	18
	Appendix A – Glossary of Common Arboreal Terms.....	19
	Appendix B – Site Survey	21

2 Introduction

NBC is the *local government area* primary consent authority relative to development & tree management for the discussed & surrounding properties.

The discussed trees are the same genus & species. They are NOT locally indigenous tree species.

Drawings & Site Survey provided confirm the discussed tree locations to be accurate.

The *Warringah DCP & NBC 'Tree Management Provisions/Guidelines'* plus the *SEPP 'Vegetation in Non Rural Areas, 25 August 2017'* are acknowledged to be the management criteria required to be addressed taking into consideration both discussed trees are within adjoining private properties.

The subject site is Zoned R2 "*Low Density Residential*" (*old Warringah Council LEP, 2011, Land Zoning Map-Sheet LZN_008*).

Trees discussed are assessed as being potentially compromised by the DA proposal & as such are proposed to be replaced. This will require the approval of both individual tree owners.

This document supports the proposed DA submission with additional neighbour co-operation as lodged based on information supplied by our client, (Architectural Plans/Elevations by Anderson Architecture Pty Ltd, dated 24 May 2019).

Should the discussed tree owners not support the replacement of their trees a 'tree root location' investigation will be required so as to determine the presence or otherwise of significant diameter 'live woody tree roots'. (Significant diameter in this instance is defined as being greater than fifty (50mm) millimetres in diameter.

Should the discussed trees be required to be retained compliance with the *Australian Standard (AS4970-2009 Protection of trees on development sites)* will be essential. This would require a site specific '*Plan of Management*' as the methodology for discussed trees to be retained without any predicable compromise to their likely medium term *Useful Life Expectancy* (from herein ULE).

3 Methodology

Assessment of the trees has been by eye from ground level & aerial photography from multiple sources. The *Visual Tree Assessment (VTA) Stage 1 principles* developed by Claus Mattheck, et.al is the assessment method & tool chosen for this site. The principles of VTA Stage 1 are explained & illustrated in the publication *The Body Language of Trees* (1994).

Assessment includes:

- Tree's current condition & likely future health.
- Perusal of NBC (old Warringah Council) "Tree Management Provisions". Perusal of NBC (old Warringah Council) "Endangered Ecological Community listing" information.
- Perusal of NBC communication/responses to the as lodged DA submission
- Review of as lodged Plans, Elevations & Sections.
- Discussion of environment where the trees are growing. Tree's amenity & retention value, such as significance, screening & habitat.

No root tissue analysis, soil testing, 'Resistograph'[®], 'ArborTom'[®] assessment or similar was undertaken.

See the following Appendices for further information:

- Appendix A Glossary of Common Arboreal terms
- Appendix B Site Survey

*** VTA–Visual Tree Assessment**, as referenced is a systematic inspection of a tree for indicators of structural defects that may pose a risk due to failure. Stage 1 is made from ground level (i.e. no aerial inspection is undertaken). An aerial inspection (Stage 2) is undertaken when there are easily identified visual indicators that suggest such an inspection is merited. Visual indicators are outlined within *The Body Language of Trees* (Mattheck & Breloer, 1994). VTA is a broadly used relatively standardised approach. More complex (can be invasive) diagnostic fault detection equipment may be recommended once visual indicators of potential defects are confirmed.

4 Observations

4.1 The Site

By NBC website 'Property Search tool & the Site Survey the site area is 569m² by calculation.

The site is developed to contain a single dwelling residence. The subject site & adjoining common boundary sites are zoned R2 'Low Density Residential'.



Figure 1: Location Map courtesy of NBC website tool.

Both discussed trees are estimated as being long term (<30 years) established, the second (smaller) tree is unlikely to be less than thirty (<30) years old. The site is NOT within an area noted to be a classified area of "Wildlife Corridor" significance. The discussed trees are not listed on any known "significant tree register".

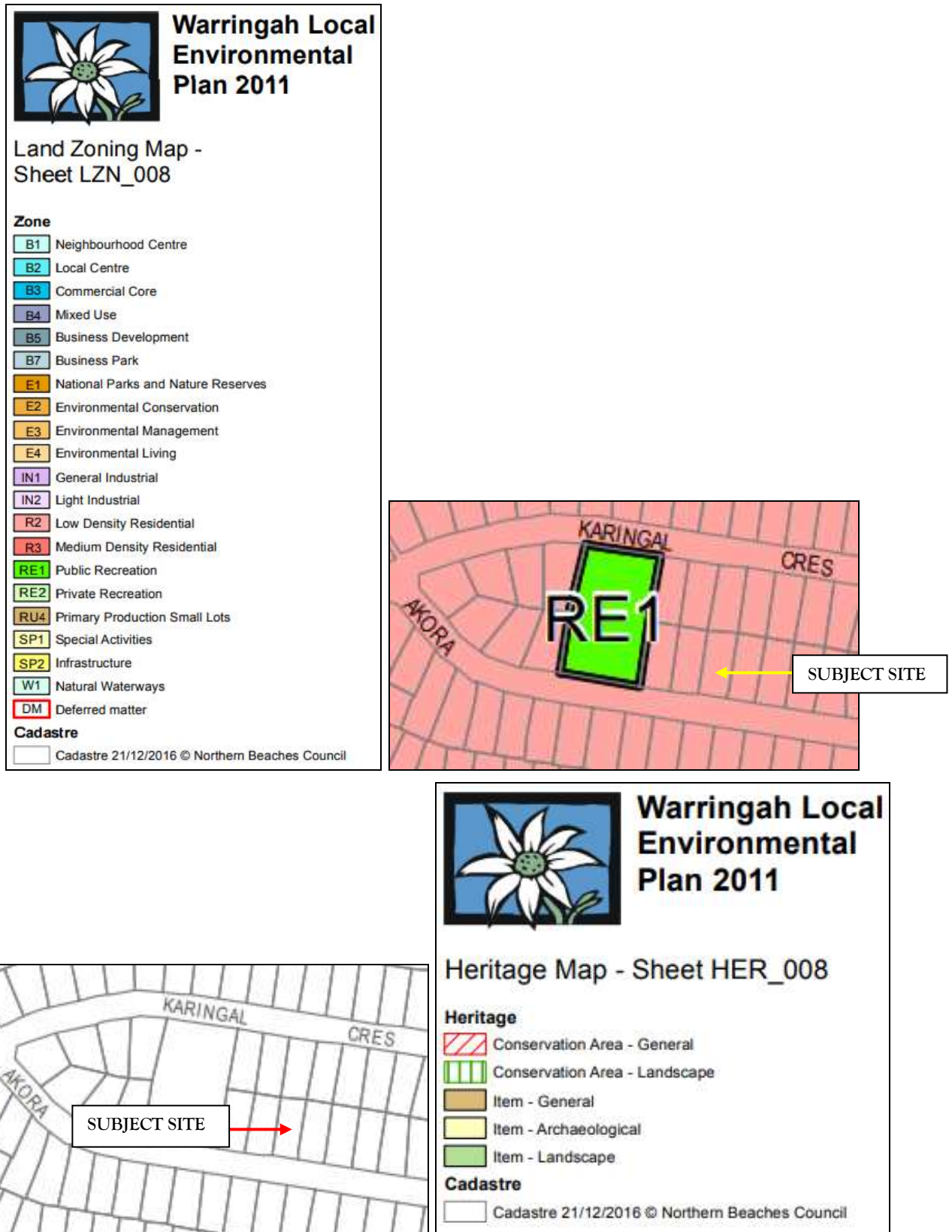
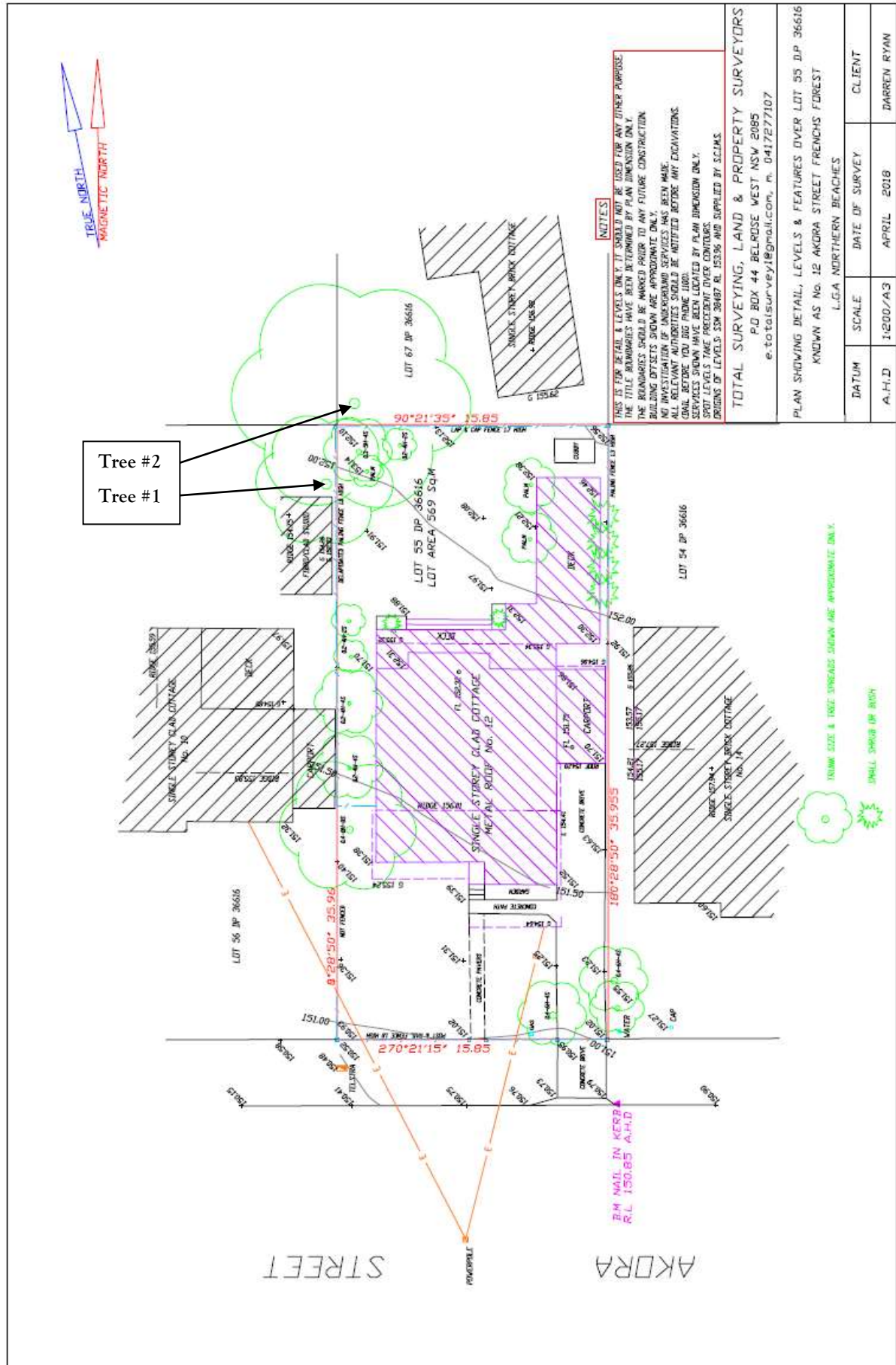
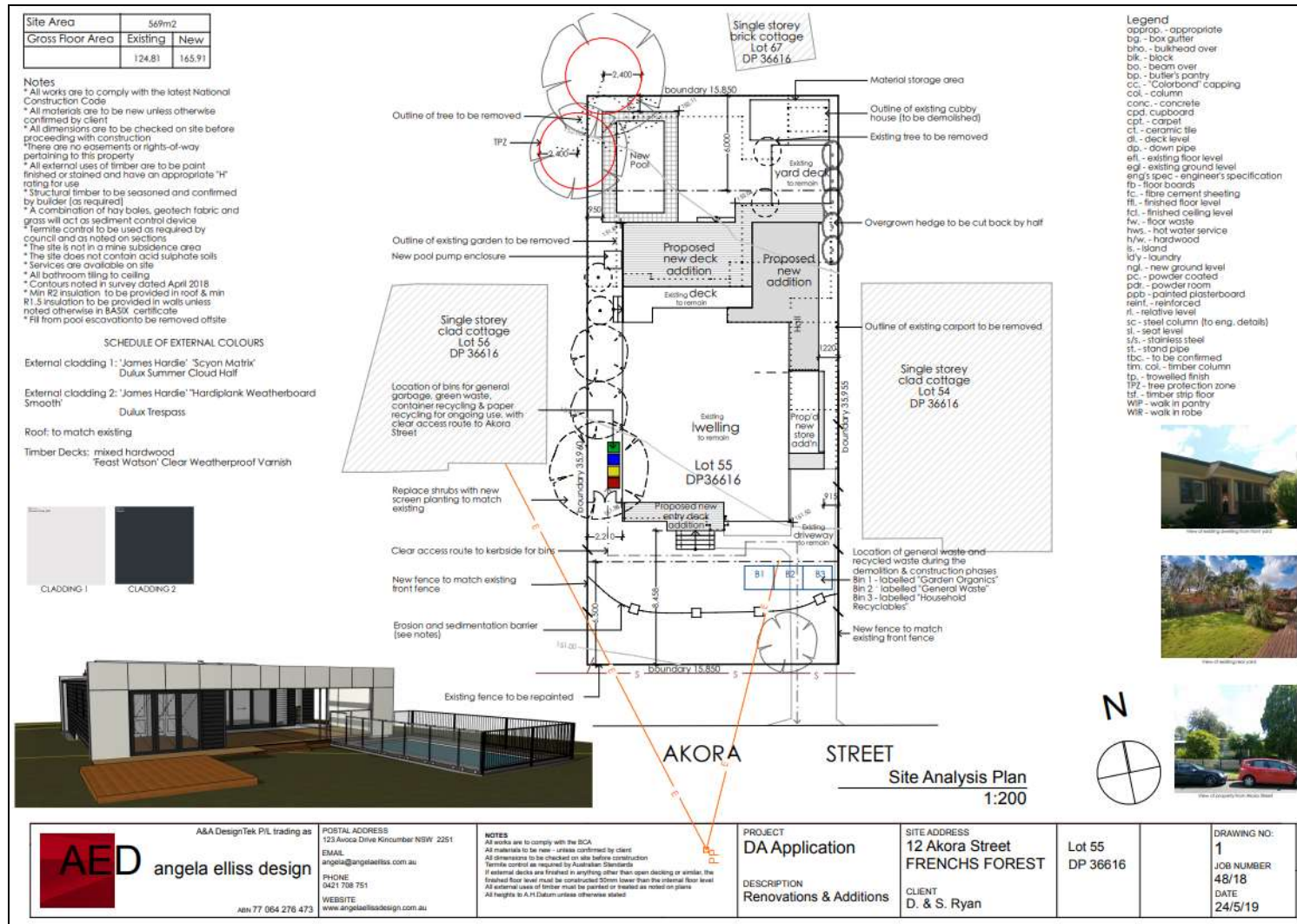
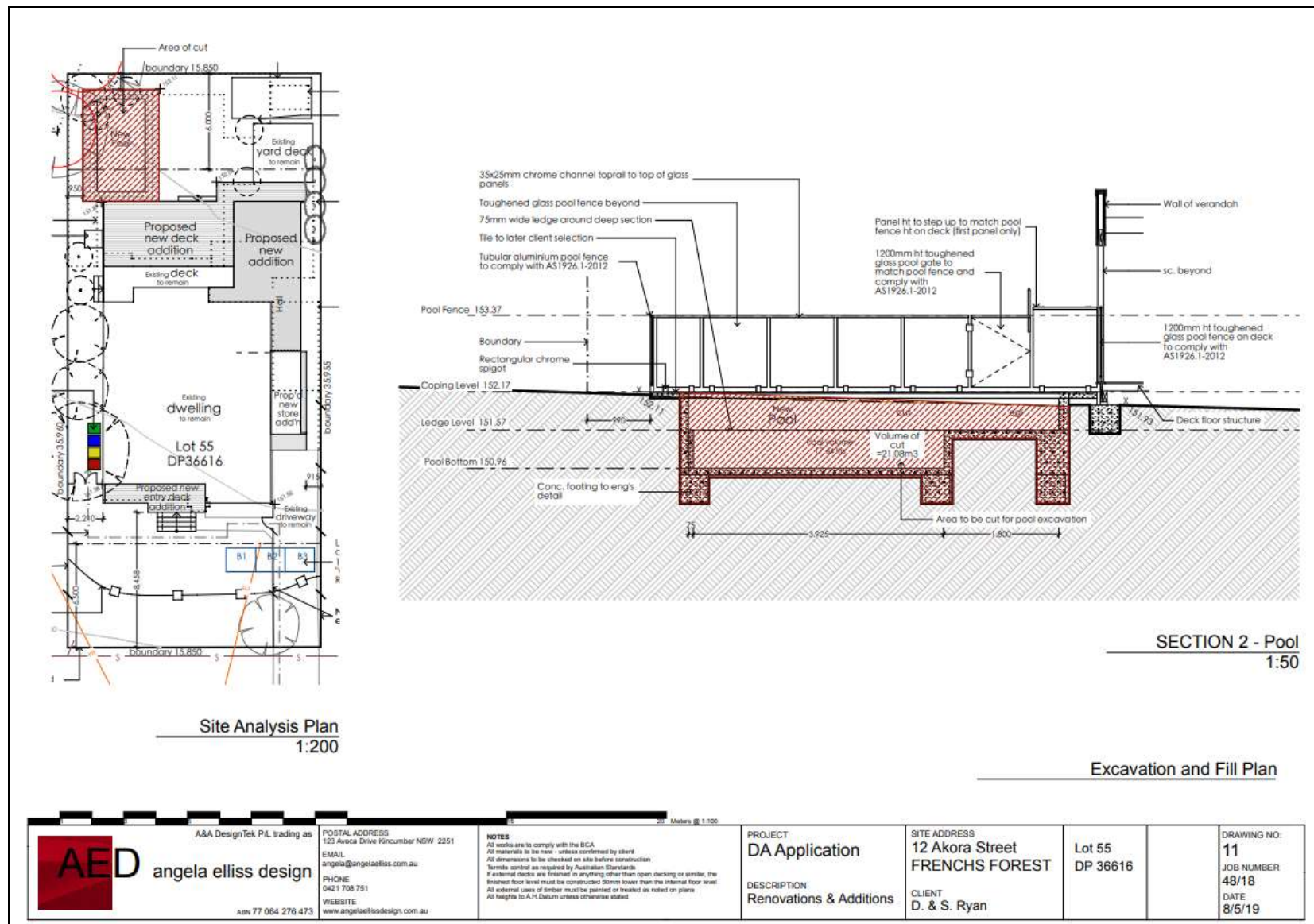


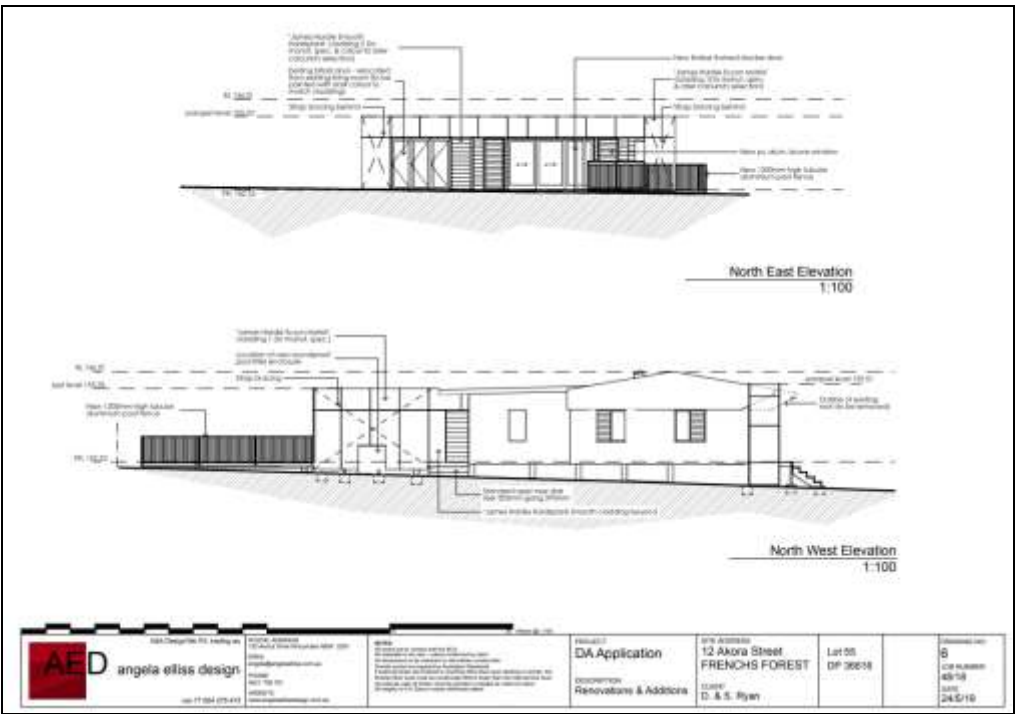
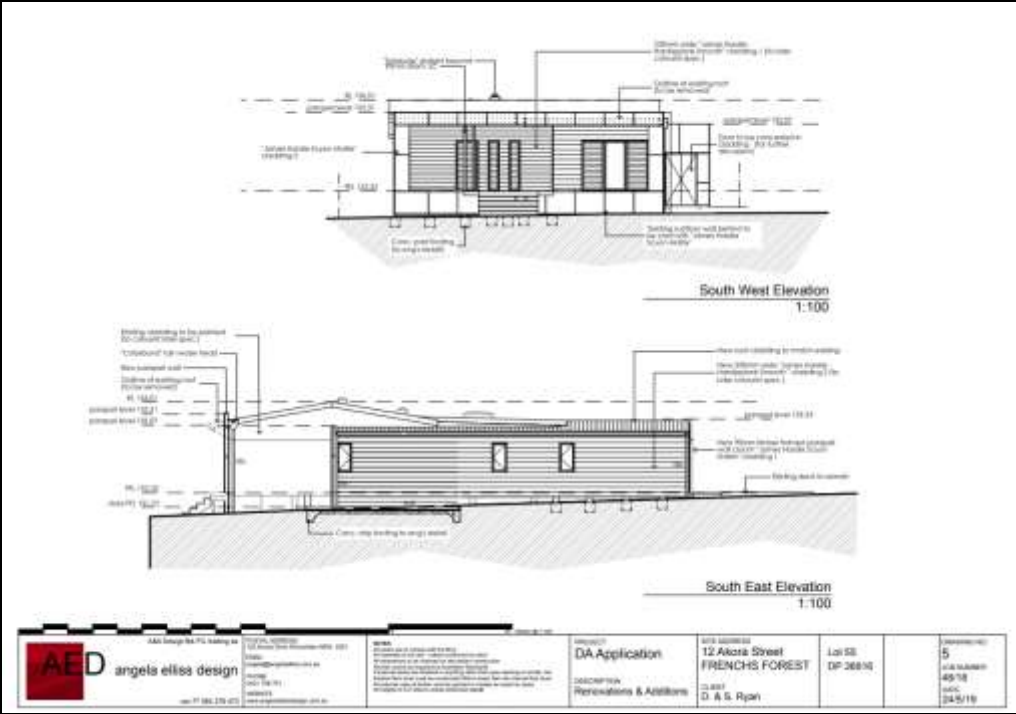
Figure 2: Subject/Adjoining Sites Land Zoning & Heritage Conservation Area status confirmed.



4.2 The Proposal







4.3 The Trees

Read this table in conjunction with Appendix A–Common Arboreal Terms

Trees Recommended for replacement relative to site characteristics & proposed works							Trees Recommended for protection & retention				
Exempt species							Trees retainable but of low amenity/significance				
	Identification	Height (approx in m)	Crown (approx in m)	DBH (approx in m)	TPZ (approx in m)	SRZ (approx in m)	Age	Health/ Vigour	Retention & Significance Value	Structure/ Form	Comments
1	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	<12.50	<5.50	0.56	6.72	2.78	M	Fair- Good/ Fair- Good	Moderate/Moderate	Typical	<u>Replace:</u> Tree is considered as not able to be viably retained without extensive 'significant diameter tree root location' investigation. (TPZ breach is calculated to be a 'major encroachment'.)
2	<i>Brachychiton acerifolius</i> Illawarra Flame Tree	<33.00	<7.00	0.64	7.68	2.95	M	Fair- Good/ Fair- Good	Moderate/Moderate	Typical	<u>Replace:</u> Tree is considered as not able to be viably retained without extensive 'significant diameter tree root location' investigation. (TPZ breach is calculated to be a 'major encroachment'.)
	Identification	Height (approx in m)	Crown (approx in m)	DBH (approx in m)	TPZ (approx in m)	SRZ (approx in m)	Age	Health/ Vigour	Retention & Significance Value	Structure/ Form	Comments

3	<i>Brachychiton acerifolius</i>										
	Illawarra Flame Tree & <i>Archontophoenix</i> spp. <i>palms</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Bangalow/Alexander Palms & <i>Syzygium</i> spp. (<i>hedge</i>)										
	Lilly Pilly (<i>hedge</i>)										

5 Discussion

The proposed swimming pool is the works council assessment officers have identified as potentially impacting upon the two (2) albeit not protected trees but trees within adjoining private property close. The discussed trees relative to their individual ULE have correctly been identified by NBC assessment officers to be potentially compromised by the as per lodged DA proposal. Simply, the proposed works are approximately 1.50m from the Tree #1 tree trunk centre & 2.50m from the Tree #2 tree trunk centre. Mathematically this equates to a 'Structural Root Zone (from herein SRZ) radial distance breach for both trees. Both trees 'Tree Protection Zones (from herein TPZ) radial distances relative to the proposed works equate (mathematically) to 'Major Encroachments' by provisions required to be addressed within the *Australian Standard (AS4970-2009 Protection of trees on development sites. (See Chapters 3,4 & 5.)*

On this basis, the best way forward relative to the as lodged DA proposal is for these trees to be replaced. As both trees are within adjoining common boundary properties (Tree #1: 10 Akora Street) & Tree #2: 25 Karingal Crescent). This requires both property owners to agree to their replacement.

Should cooperation not be forthcoming from one (1) or both common boundary property owners two (2) options exist relative to achieving the construction of the swimming pool. They are;

Option #1: Reposition the swimming pool to be no closer than 2.50m from the 10 Akora Street common boundary & 2.00m from the 25 Karingal Crescent common boundary. This option removes the SRZ mathematical radial distance breach but would still require a 'manually excavated' significant diameter 'live tree root location' investigation. Ultimately, this could also result in the below Option #2 still being required.

Option #2: Reposition/Redesign the swimming pool to be no closer than 3.50m from the 10 Akora Street common boundary & 3.50m from the 25 Karingal Crescent common boundary. This would reduce the as calculated 'Major Encroachment' to around 10% of total TPZ surface area which would then equate to compliance with the AS4970-2009 requirements to reduce the TPZ total surface area breach to a 'Minor Encroachment'.

Trees #3 within Section 4.3 of this document can be removed by the property owner of 12 Akora at any time regardless of any proposal for development.

6 Site Specific 'Tree Plan of Management'

(if Tree #1 & Tree #2 are to be retained)

OPTION #1:

Tree #1:

- *Retain, Protect & Manage*
- *Requires 'Manually Excavated' live woody tree root location' excavation outside the tree's calculated 2.78m SRZ radial distance.*

- *No excavated or builders' materials of any description is allowed to be stored on existing ground levels within the trees calculated 6.72m TPZ radial distance.*
- *Any excavation required within 6.72m of the tree trunk centre must be completed manually. Any 'live woody tree root less than 50mm in diameter may be severed cleanly without the input of the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of works completed must be provided to the Principle Certifying Authority).*
- *Any 'live woody tree root greater than 50mm in diameter can only be managed with input from the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of the strategy adopted for individual root management must be provided to the Principle Certifying Authority).*
- *Ground level protection by installing & maintaining a composted Native Tree 'mulch' to a depth of between 50 & 75mm at all times is essential within its TPZ radial distance within the subject site.*
- *Photograph the tree canopy prior to the beginning of any DA determined works.*

Tree #2:

- *Retain, Protect & Manage*
- *Requires 'Manually Excavated' live woody tree root location' excavation outside the tree's calculated 2.95m SRZ radial distance.*
- *No excavated or builders' materials of any description is allowed to be stored on existing ground levels within the trees calculated 7.68m TPZ radial distance.*
- *Any excavation required within 7.68m of the tree trunk centre must be completed manually. Any 'live woody tree root less than 50mm in diameter may be severed cleanly without the input of the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of works completed must be provided to the Principle Certifying Authority).*
- *Any 'live woody tree root greater than 50mm in diameter can only be managed with input from the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of the strategy adopted for individual root management must be provided to the Principle Certifying Authority).*
- *Ground level protection by installing & maintaining a composted Native Tree 'mulch' to a depth of between 50 & 75mm at all times is essential within its TPZ radial distance within the subject site.*
- *Photograph the tree canopy prior to the beginning of any DA determined works.*

OPTION #2:

Tree #1:

- *Retain, Protect & Manage*

- *Requires relocation/design of the proposed swimming pool so as to reduce the TPZ total surface area (141.87m²) 'Major Encroachment' breach to less than 10% of the total surface area to achieve a 'Minor Encroachment' breach.*
- *No excavated or builders' materials of any description is allowed to be stored on existing ground levels within the trees calculated 6.72m TPZ radial distance.*
- *Any excavation required within 6.72m of the tree trunk centre must be completed manually. Any 'live woody tree root less than 50mm in diameter may be severed cleanly without the input of the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of works completed must be provided to the Principle Certifying Authority).*
- *Any 'live woody tree root greater than 50mm in diameter can only be managed with input from the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of the strategy adopted for individual root management must be provided to the Principle Certifying Authority).*
- *Ground level protection by installing & maintaining a composted Native Tree 'mulch' to a depth of between 50 & 75mm at all times is essential within its TPZ radial distance within the subject site.*
- *Photograph the tree canopy prior to the beginning of any DA determined works.*

Tree #2:

- *Retain, Protect & Manage*
- *Requires relocation/design of the proposed swimming pool so as to reduce the TPZ total surface area (185.30m²) 'Major Encroachment' breach to less than 10% of the total surface area to achieve a 'Minor Encroachment' breach.*
- *No excavated or builders' materials of any description is allowed to be stored on existing ground levels within the trees calculated 7.68m TPZ radial distance.*
- *Any excavation required within 7.68m of the tree trunk centre must be completed manually. Any 'live woody tree root less than 50mm in diameter may be severed cleanly without the input of the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of works completed must be provided to the Principle Certifying Authority).*
- *Any 'live woody tree root greater than 50mm in diameter can only be managed with input from the sites retained Practicing/Consulting Arborist, (both written & photographic evidence of the strategy adopted for individual root management must be provided to the Principle Certifying Authority).*
- *Ground level protection by installing & maintaining a composted Native Tree 'mulch' to a depth of between 50 & 75mm at all times is essential within its TPZ radial distance within the subject site.*
- *Photograph the tree canopy prior to the beginning of any DA determined works.*

7 Recommendations:

By providing the requested additional information relative to tree management to *NBC* officers assessing/determining the likely required to be amended lodged Development Application (2019/0625) the proposal should now be able to be determined.

If you have any questions relating to this report or require the implementation of recommendations, please contact Kyle Hill (Monday to Friday) on 02 9939 0078.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'K Hill', is placed over a faint, light-colored rectangular stamp or watermark.

Kyle A Hill, Practicing & Consulting Arborist (AQF level 8)

8 Limitations on the use of this report

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, & directly attached to that submission, report or presentation.

9 Assumptions

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible; however, AURA Tree Services Pty Ltd, can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the trees that were examined & reflects the condition of the trees at the time of inspection; and

The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

10 Recommended References

- Barrell, J. 1993. 'Preplanning Tree Surveys: Safe Useful Life Expectancy (SULE) is the Natural Progression', Arboricultural Journal 17:1, February 1993,
- Barrell, J. 1995, 'Pre-development Tree Assessments', in Trees & Building Sites, Proceedings of an International Conference Held in the Interest of Developing a Scientific Basis for Managing Trees in Proximity to Buildings, International Society of Arboriculture, Illinois,
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- Phillip J. Craul, 'Urban Soil in Landscape Design', J. Wiley & Sons, New York USA 1992,
- Clark, Ross, 'A Guide to Assessment of Tree Quality'. NATSPEC/ Construction Information, Milson's Point NSW, 2003 &
- Clark, Ross. 'Purchasing Landscape Trees', Construction Information Systems Australia Pty. Ltd., Milson's Point NSW, 1996.

11 Selected Bibliography

- Hitchmough, J.D. 1994. 'Urban Landscape Management', Inkata Press, Sydney.
- Mattheck, C. & Breloar, H. (1994) 'Body Language of Trees'. The Stationery Office. London.
- AS4373.2007 'Pruning of amenity trees', Standards Australia.
- AS4970.2009 'Protection of trees on development sites', Standards Australia.
- BS5837-2005. 'Guide for Trees in Relation to Construction', Standards Board, UK.

Appendix A – Glossary of Common Arboreal Terms

Age:	I	<i>Immature</i> refers to a refers to a well-established but juvenile tree
	SM	<i>Semi-mature</i> refers to a tree at growth stages between immaturity & full size
	M	<i>Mature</i> refers to a full sized tree with some capacity for further growth
	LM	<i>Late Mature</i> refers to a full sized tree with little capacity for growth that is not yet about to enter decline
	OM	<i>Over-mature</i> refers to a tree about to enter decline or already declining
	LS	<i>Live Stag</i> refers to a tree in a significant state of decline. This is the last life stage of a tree prior to death.

Hth & Vig Health & Vigour

Health refers to the tree's form & growth habit, as modified by its environment (aspect, suppression by other tree, soils) & the state of the scaffold (ie. trunk & major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health & it is possible for a tree to be healthy but in poor condition/vigour.

Classes are:

Excellent (E), V. Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP)

Vigour refers to the tree's growth rate/condition as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion & the degree of dieback.

Classes are:

Excellent (E), V. Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP)

Useful Life Expectancy refers to any trees potential life expectancy (viability) not related to potential disturbances based on VTA assessment, classifications are: **Short, (0 – 5 years), Medium, (5 – 15 years) & Long, (15 or more years).**

Retention Value is expressed as Low, Medium, High or of Heritage Importance

Diameter at Breast Height (DBH) refers to the tree trunk diameter at breast height (1.4 metres above ground level).

Significant Diameter Roots are defined as being woody roots with a diameter greater than 0.05m/50mm. (Unless otherwise specified)

Structural Root Zone (SRZ) refers to a radial offset which relates to tree stability. This zone is presumed to be main location of the tree's structural support roots. It is calculated using the formula $SRZ\ radius = (D \times 50)^{0.42} \times 0.64$.

Tree Protection Zone (TPZ) is ideally a "No Go Zone" surrounding a tree to aid in its ability to cope with disturbances associated with construction works. $TPZ = DBH \times 12$. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree's decline in health or death & the possibly damage to structural stability of the tree from root damage

To limit damage to the tree, protection within a specified distance of the tree's trunk must be maintained throughout the proposed development works. No excavation, stockpiling of building materials or the use of machinery is permitted within the TPZ

A TPZ is required for each tree or group of trees within five metres (unless otherwise specified) of building envelopes.

Stem/bark inclusion refers to a genetic fault in the tree's structure. This fault is located at the point where the stems/branches meet. In the case of an inclusion this point of attachment is potentially weak due to bark obstructing healthy tissue from joining together to strengthen the joint

Decay refers to the break down tissues within the tree. There are numerous types of decay that affect different types of tissues, spread at different rates & have different affect on both the tree's health & structural integrity

Point of Attachment refers to the point at which a stem/branch etc join

Dead wood refers to any whole limb that no longer contains living tissues (eg live leaves &/or bark). Some dead wood is common in a number of tree species.

Die back refers to the death of growth tips/shoots & partial limbs. Die back is often an indicator of stress & tree health

One dimensional crown refers to branching habits & leaves that extend/grow in One direction only. There are many causes for this growth habit such as competition & pruning

Crown Foliage Density of Potential (CFDP) refers to the density of a tree's crown in relation to the expected density of a healthy specimen of the same species. CFDP is measured as a percentage

Epicormic growth/shoots refers to growth/shoots that are/have sprouted from axillary buds within the bark. Epicormic growth/shoots are a survival mechanism that often indicates the presence of a current or past stress even such as fire, pruning, drought etc

Over Head Powerlines (OHP) Over head electricity wiring.

LVOHP	Low Voltage Over head Powerlines
HVOHP	High Voltage Over head Powerlines
ABC	Aerial Bundled Cable

Appendix B – Site Survey

