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ARBORICULTURE IMPACT ASSESSMENT *re Development Application (DA2018/0569) Submission* **JUNE 2018**

Site: Lot 20 in DP 22275
60 Binburra Avenue
AVALON BEACH, NSW 2107

Client: Julian Train
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Commissioned: Julian Train

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1 Summary

Julian Train (property owner), secured the services of Growing My Way Tree Consultants (GMW) to prepare an *Arboriculture Impact & Management Assessment* as additional information for the lodged *Development Application (DA)* for Alterations/Additions to the existing dwelling including construction of a secondary dwelling & swimming pool at 60 Binburra Avenue, Avalon Beach.

One (1) individual tree & five (5) multiple groups of trees are discussed. All discussed trees are located within adjoining land identified as 60 Binburra Avenue (from herein the subject site).

The *Northern Beaches Council* (from herein NBC) 'preliminary assessment' (dated 13 June 2018) of the as lodged DA states an 'area of insufficient information has been identified'. At the time of their 'preliminary assessment' notice being served they state the information supplied 'will not allow the Council to support the application in its present form'.

NBC officers have relative to the 'Pittwater 21 Development Control Plan, (B4.6 Wildlife Corridors)' set out six (6) requirements required to achieve compliance in a manner they would support. The subject site relative to 'Wildlife Corridor' status is within the CO3 classification. These zones actually have more potential for improvement relative to supporting 'Wildlife Corridors' than actual trees able to be considered as part of an established (functioning) 'Wildlife Corridor'.

The NBC is the sole determining local government authority.

I, Kyle A Hill, as a qualified Practising & Consulting Arborist, have prepared this document based on "Visual Tree Assessment" (VTA) undertaken on Saturday, 23 June 2018. K A Hill is the sole author of this document.

The aim of this report is:

- i. Provide valid reasons to support the proposed development relative to tree management;
- ii. Provide an achievable Tree Management Strategy for the discussed to be retained tree
- iii. Confirm no trees within adjoining private lands will be affected in any manner by the DA submission.

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3 Introduction

This report contains observations & recommendations intended to act as the site specific developed “Tree Management Strategy” for the one (1) individual & multiple group of trees discussed. Trees discussed are located within both the front & rear yards as well as the front roadside reserve of the subject site discussed.

The sole consent authority is the NBC.

This report discusses & confirms the ‘updated documentation’ to the as lodged DA proposal to address the following (cut & pasted from NBC notification) issues by NBC officers:

- Development shall retain, & provide an adequate buffer to, wildlife corridors;
- Development shall provide wildlife corridors via creation, restoration, &/or regeneration of habitat;
- Development shall not result in a significant loss of canopy cover or a net loss in native canopy trees;
- Development shall ensure that at least 60% of any new planting incorporates native vegetation;
- Landscaping is to e outside areas of existing bushland & not include environmental weeds
- Planting is to maximise linkage within the wildlife corridor.

Only one (1) tree, a (*Corymbia gummifera*, common name Red Bloodwood) is assessed as being subject to the old but still active guideline document *Pittwater 21 DCP ‘Tree Management Provisions’*. It is protected by virtue of both species & size. Numerous *Livistona australis*, common name Cabbage Palms are confirmed to be within the subject site but are all considered to be exempt from the *Pittwater 21 DCP ‘Tree Management Provisions’* by virtue of size. (All are by trunk height well les than three (3.00m) meters tall.) All other vegetation potentially impacted upon by the proposed Alterations/Additions is made up of exempt species, primarily Palms.

Documents referenced include:

Site Survey by Total Surveying Solutions, dated 17 March 2016;

Plans & Elevations by FineLine building design professionals, Drawings # DA01, DA02, DA05, DA07, DA08, DA10 & DA11, issued 4 April 2018;

Landscape Concept Plan (updated) by Secret Gardens, Drawing #LC-01, Revision B, dated 07 June 2017;

NBC website, [Pittwater 21 Development Control Plan, 2014 (see PC 21 DCP clauses B4.6 Wildlife Corridors, B4.22 Preservation of Trees & Bushland Vegetation, parts B & C, starting on page 103) plus the August 2017 new State Environmental Planning Policy (SEPP Vegetation in Non Rural Areas, 454)]

NBC notification dated 13 June 2018.

NSW Department of Lands website, (SixMaps property information tool)

The proposed works with implementation of this documents site specific “*Tree Management Strategy*” (addressing NBC officers six (6) issues) in our opinion equates to compliance with the identified issues list.

This document will support the proposed works as presented by documentation provided. Note; the landscape plan lodged is replaced by LC-01, Revision B.

4 Methodology

Assessment Methodology for the discussed tree has been from ground level by eye, using *Visual Tree Assessment (VTA Stage 1)* techniques developed by Claus Mattheck. The principles of VTA are illustrated & explained in his widely used reference textbook “*The Body Language of Trees (1994)*”.

Assessment includes:

- *Tree’s current condition & likely future health.*
- *Consideration of surrounding properties existing infrastructure with respect to the proposed development within the subject site.*
- *Species tolerance to root disturbance &/or development.*
- *Likely present & future risk to persons & property.*
- *Tree’s (public & private landscape) amenity value, taking into account habitat potential.*

No root analysis, soil testing, ‘Resistograph’® drilling or aerial canopy inspection was undertaken. See the following Appendices for further information:

- *Appendix A Glossary of Common Arboreal term;*
- *Appendix B Site Survey, Plans & Elevations &*
- *Appendix C Tree Management Strategy.*

* **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.

5 Observations

5.1 The Site

The total site area of **60 Binburra Avenue, Avalon Beach** (Lot 20 in DP 22275) is 1043.00m² by survey.

The site is presently developed to contain a free standing single dwelling residence.

Adjoining common boundary properties are developed to contain single dwelling residences.

The discussed site is only able to be accessed via Binburra Avenue for both pedestrians & motor vehicles.

The subject site is NOT within a *Heritage Conservation Area*. Vegetation within the subject site does NOT in any significant manner represent any local plant community or close by *Endangered Ecological Community*. The discussed trees are within a *Pittwater 21 DCP* classified “wildlife corridor” (CO3-Residential areas with some tree cover but requiring supplementary planting to aid fauna movements).



Figure 1: Above, street plan identifying the subject site (courtesy of NBC).

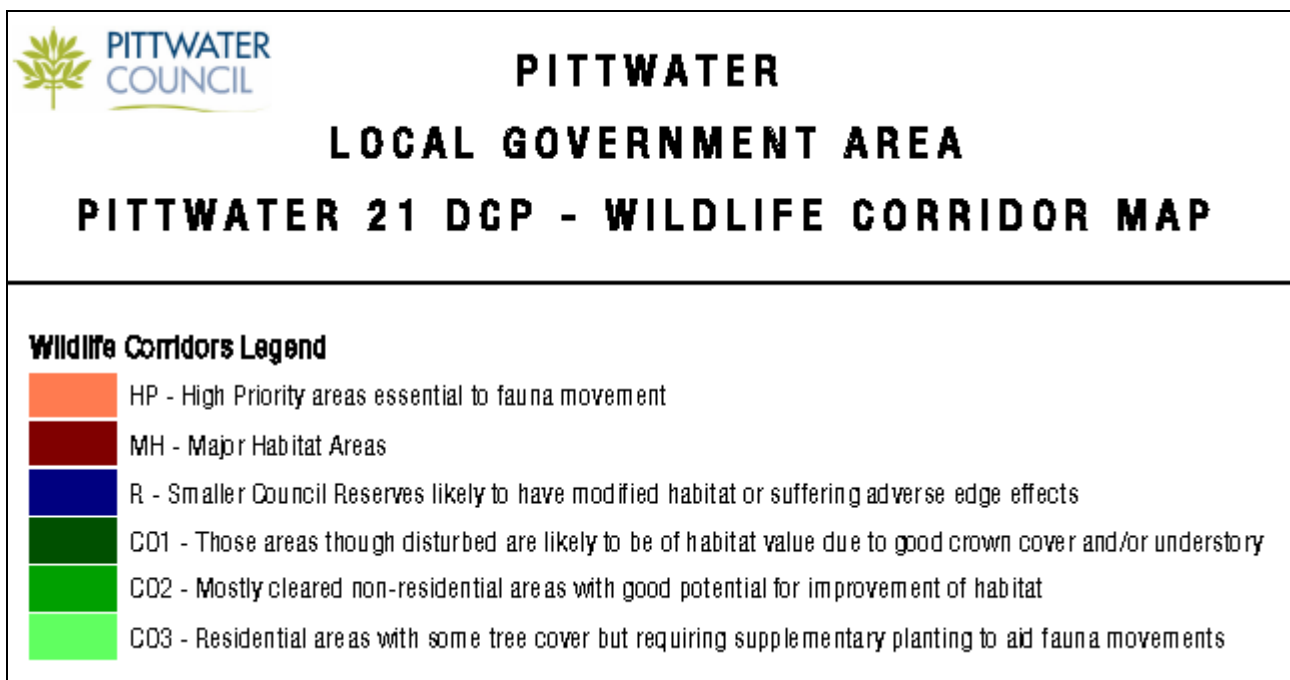
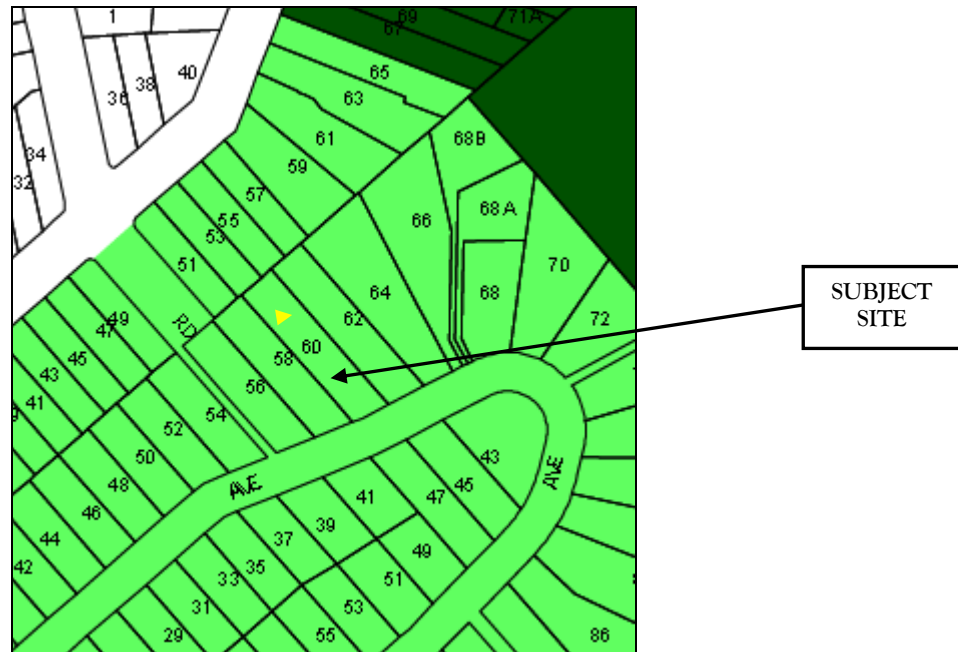


Figure 2: Above confirms 'Wildlife Corridor' status of the subject & nearby adjoining sites.

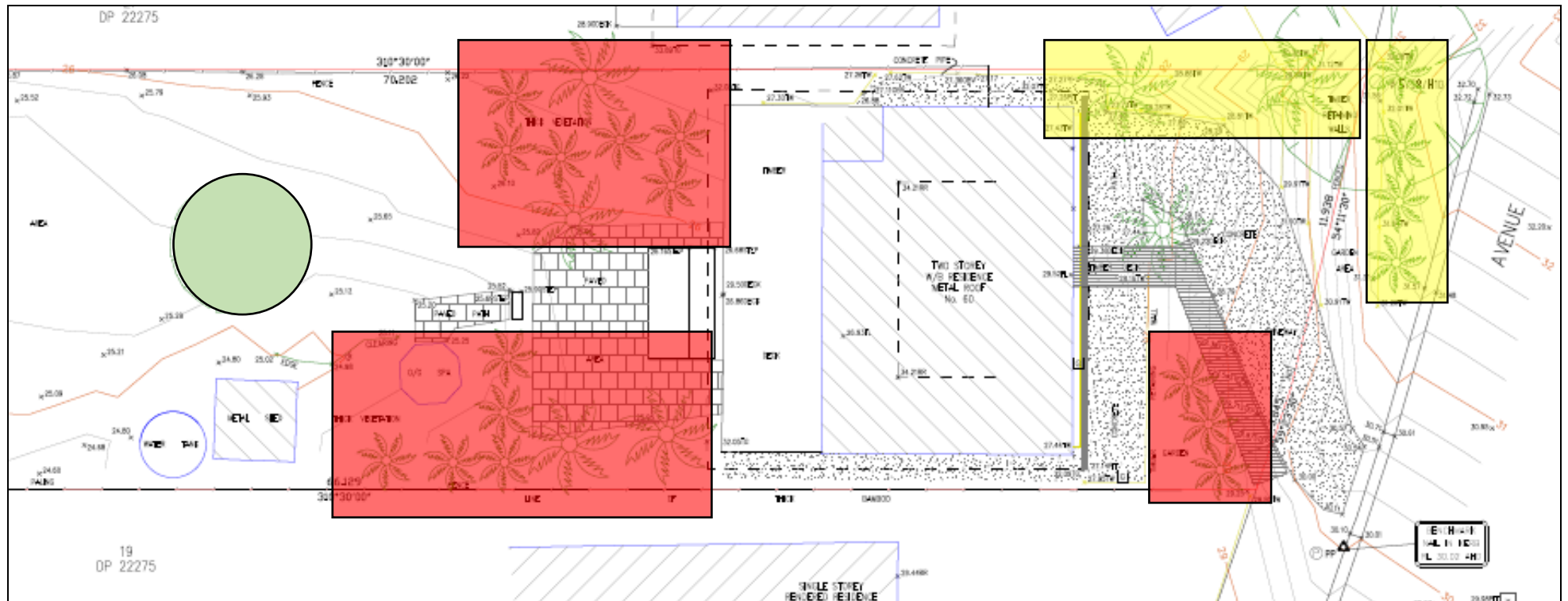
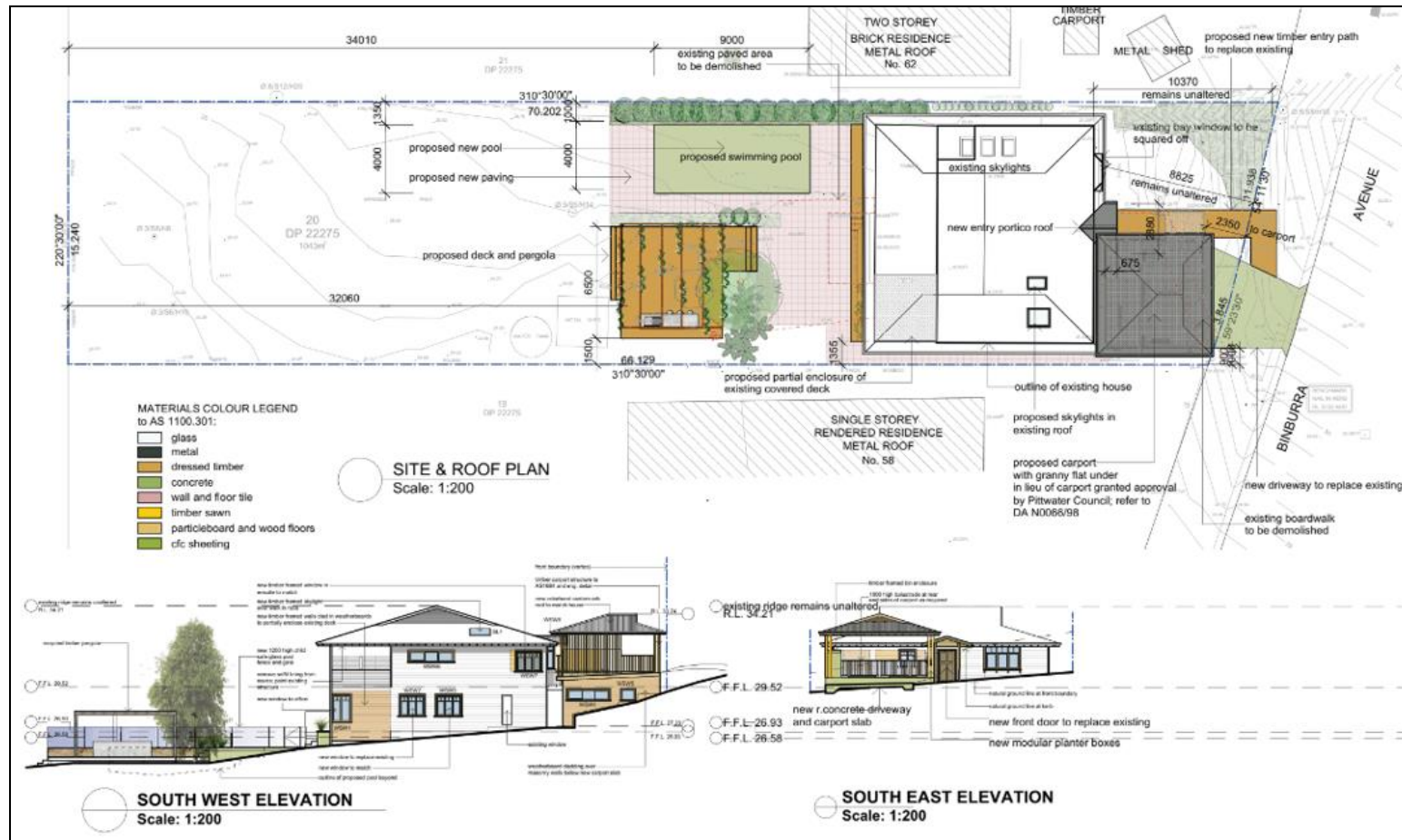
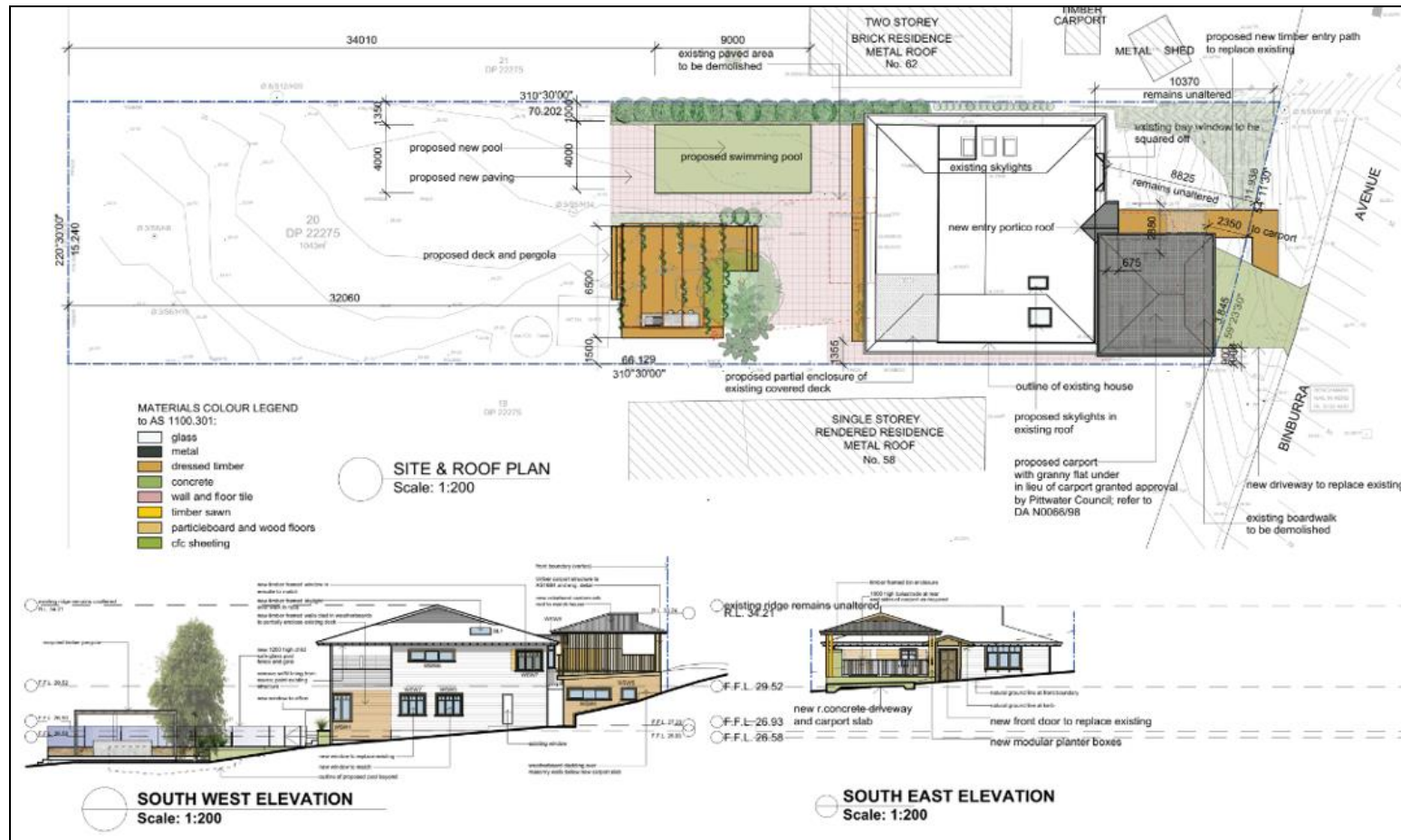


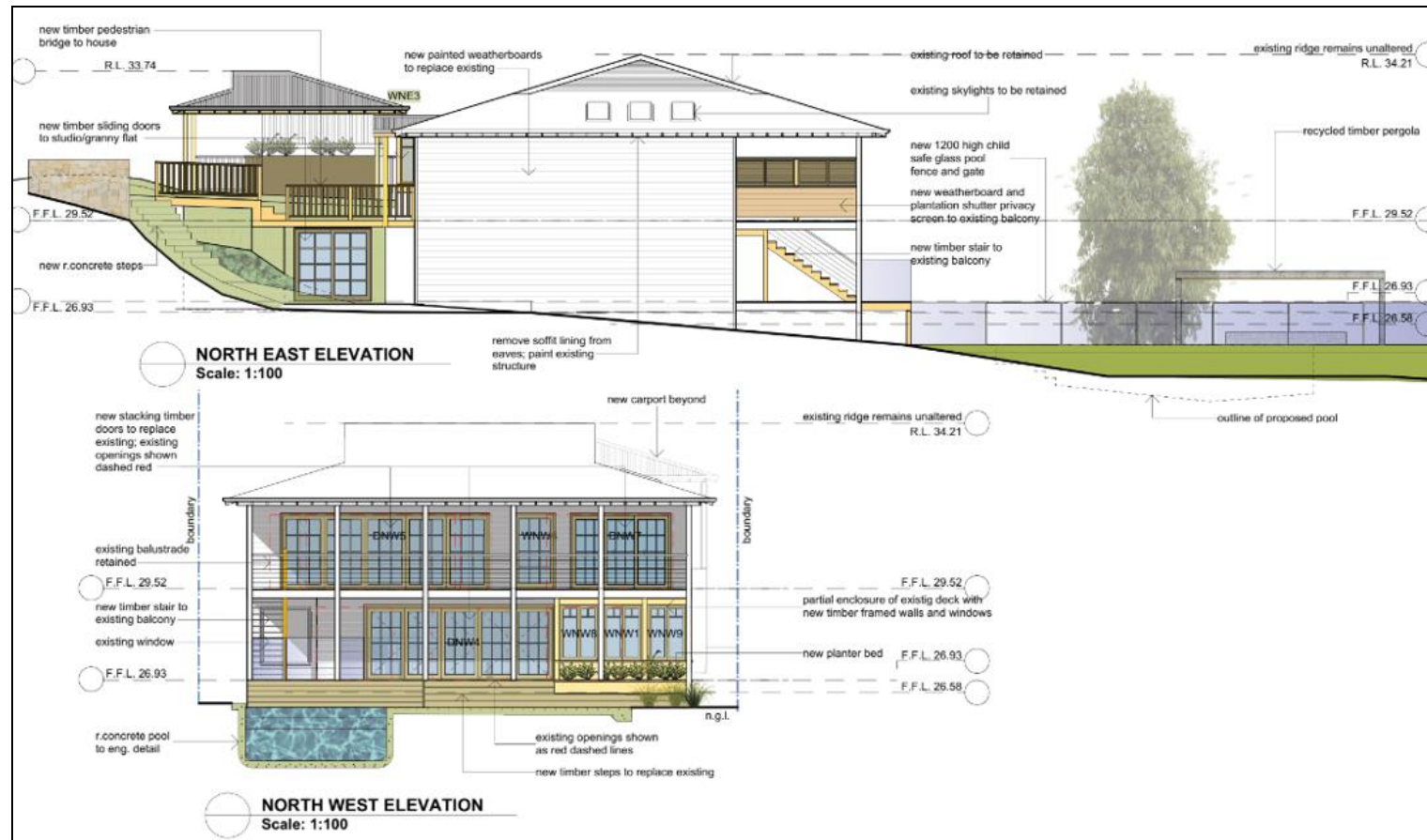
Figure 3: Illustrates portion of Site Survey with discussed tree is marked with a “green circle”. Trees marked within Yellow Boxes are not impacted upon by the DA proposal. Trees within Red Boxes are largely proposed to be removed/replaced.

5.2 The Proposal









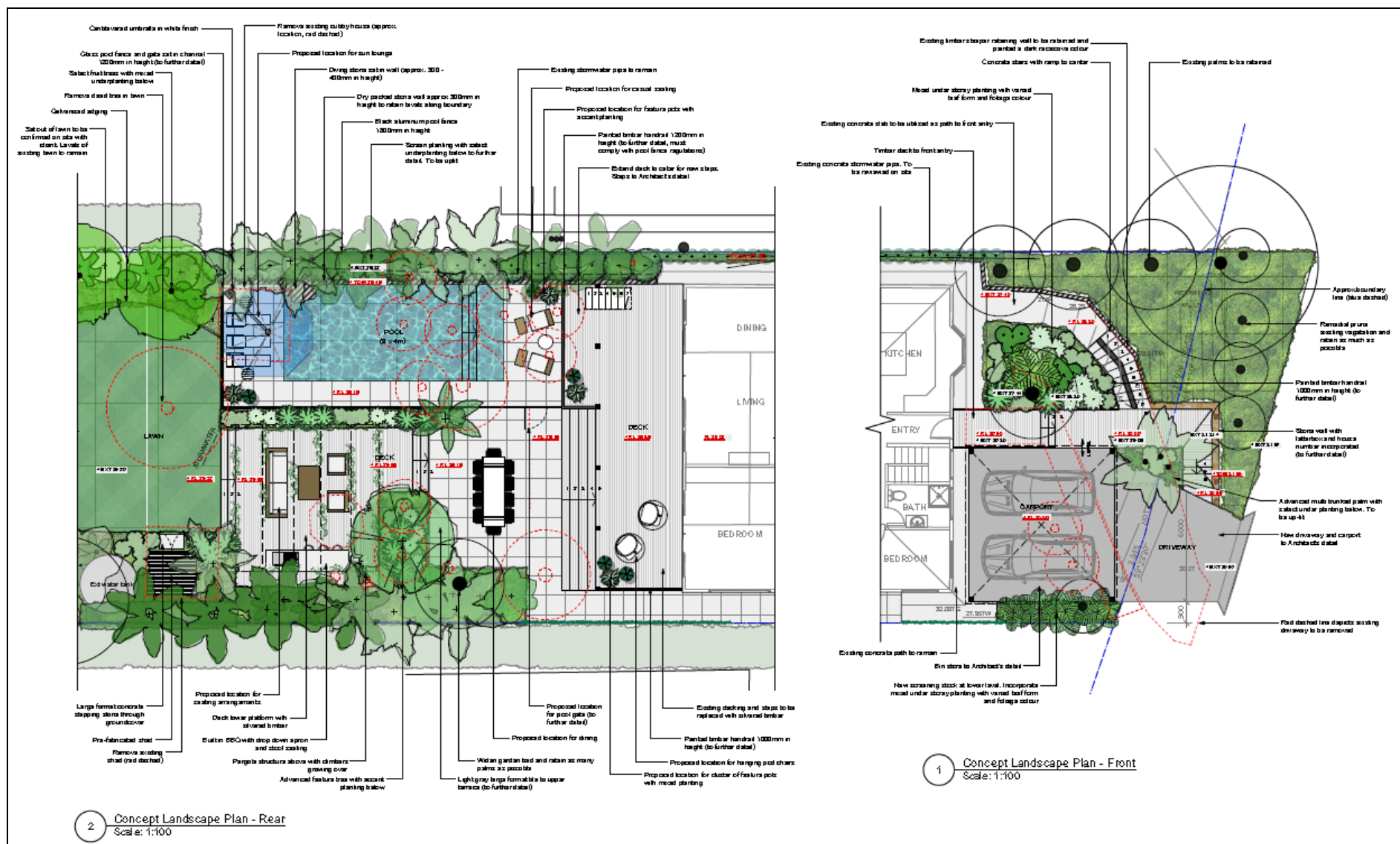


Figure 4: Illustrates proposed Landscape Concept for Rear Yard (Left Side of Plan) & Front Yard (Right Side of Plan).

5.3 The Trees – Summary Table

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

Trees Recommended for removal								Trees Recommended for 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>Assorted Palms, Non woody plants etc.</i> <i>Located within the Binburra Avenue roadside reserve.</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<u>Retain & Manage:</u> Trees are well away from major proposed works.
2	<i>Assorted Palms, Non woody plants etc.</i> <i>Located within the front yard, east side of the subject site.</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<u>Retain & Manage:</u> Trees are well away from major proposed works.

3	<i>Assorted Palms, Non woody plants etc.</i> <i>Located within the front yard, west side of the subject site where the proposed garage is located.</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<u>Remove & Replace:</u>
4	<i>Assorted Palms, Non woody plants etc.</i> <i>Located within the rear yard, west side of the subject site where proposed entertainment area is located.</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<u>Remove & Replace:</u>
5	<i>Assorted Palms, Non woody plants etc.</i> <i>Located within the front yard, west side of the subject site where the proposed swimming pool is located..</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<u>Remove & Replace:</u>

6	<p><i>Corymbia gumifera</i></p> <p><i>Red Bloodwood Gum</i></p> <p><i>Located within the centre of the rear yard where the Rev B landscape concept proposes a turfed area to be located.</i></p>	<13.50	<6.50	<0.38	4.60	2.20	M	Poor to Fair & Poor to Fair	High & High	Typical Structure/Form Significant branch tip dieback noted.	<p><u>Remove & Replace:</u></p> <p>Tree Useful Life Expectancy has been compromised by a 'change of environment' (raised natural soil levels) by previous site works. Tree is noted to be in a 'state of advanced decline'.</p>
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5.4 *Tree & Site Images*

Site Photographs taken on 23 June 2018 (Canon G1X digital camera)



Figure 5: Left side of driveway vegetation to be removed/replaced for proposed garage. Centre-right vegetation whilst not protected will be retained at the front of the subject site.



Figure 6: Illustrates east/south area of subject site front proposed to be retained vegetation, (confirmed to not be protected).



Figure 7: Illustrates east & west sides of rear yard trees mostly proposed to be removed/replaced. Centre of photograph illustrates location of the only identified as protected tree species discussed.

6 Discussion

General Discussion

NBC issues:

- Development shall retain, & provide an adequate buffer to, wildlife corridors;
Remedy; Plant mostly towards the rear of the backyard new locally indigenous canopy trees.
- Development shall provide wildlife corridors via creation, restoration, &/or regeneration of habitat;
Remedy/Comment; new trees planted will CREATE smaller gaps between trees in the broader local environment (i.e. trees within adjoining properties) existing trees.
- Development shall not result in a significant loss of canopy cover or a net loss in native canopy trees;
Remedy/Comment; new trees planted will CREATE improved canopy density as most trees required to be removed are palms which really do not qualify as canopy tree species.
- Development shall ensure that at least 60% of any new planting incorporates native vegetation;
Comment; see suggested 'list of locally indigenous' new suitable tree species.
- Landscaping is to be outside areas of existing bushland & not include environmental weeds
Remedy/Comment; new trees planted towards the rear of the backyard will increase canopy density & create a 'bushland effect', not noted to exist at the present time.
- Planting is to maximise linkage within the wildlife corridor.
Remedy/Comment; new trees planted will ELIMINATE gaps to 'linking canopies within the local environment (i.e. trees within adjoining properties) existing trees.

One (1) tree, (Tree #6) noted in as lodged documentation to be a dead tree is actually not dead but in a 'state of advanced decline'. It is confirmed to be a locally indigenous tree species. Its 'state of advanced decline' of advanced decline is easily explained. Previous subject site owners (not the as proposed DA DA benefactors) in an effort to create a near level outdoor (grassed) playing area have changed natural soil levels. Simply, natural soil levels have been raised. The evidence being side of rearyard battered/grassed edges parallel to adjoining long common boundary properties & 'NO EXPOSED Tree #6 base of tree trunk flare, (a classic give-away).

As a direct consequence of the 'change of natural environment' soil levels Tree #6 displays classic indicators of 'tree root dysfunction'. They include 'branch tip dieback' as well as the death of larger diameter dead branches that the property owner confirmed to have been recently pruned on the 'grounds of safety'.

No one can accurately estimate how long the it will take for Tree #6 to actually die. However, it will never recover to be a healthy example of its species.



Figure 8: Above photograph confirms 'total absence of tree trunk base flare'. Below illustrates 'dead/dying branch & branch tips' as described in text.



For trees proposed to be retained the *Australian Standard (AS4970-2009 Protection of trees on development sites)* is the industry management tool used to quantify the below tree management & specifications considered to be best practice in this situation. The Sections within the AS4970-2009 document required to be addressed for compliance includes Section 1 (pages 7 thru 10), Section 3, (11 thru 14), Section 4 (pages 15 thru 20 & Section 5 (pages 21 thru 23).

Trees #1 are not proposed to be subjected to any ground level disturbance. On the basis they are within the front of the subject site roadside reserve which is an area where NBC would not tolerate disturbance (unless absolutely necessary) or storage of any building materials (of any description) it is not considered necessary to isolate these trees by the installation of any temporary 'physical barrier'.

Trees #2 are not proposed to be subjected to any ground level disturbance. On the basis they are within the front of the subject site (east side) & well away from any proposed disturbance it is not considered necessary to isolate these trees by the installation of any temporary 'physical barrier'.

Trees #3 are located within the front yard of the subject site. They are assessed/confirmed as required to be removed by virtue of the location of the proposed new garage & secondary dwelling.

Trees #4 are located within the west side of the rear yard of the subject site. They are assessed/confirmed as mostly being required to be removed by virtue of the location of the proposed outdoor entertaining area.

Trees #5 are located within the east side of the rear yard of the subject site. They are assessed/confirmed as being required to be removed by virtue of the location of the proposed swimming pool & swimming pool surrounds.

Tree #6 by location is technically able to be retained but by virtue of its 'advanced state of decline' it is supported to be removed & replaced.

The number of replacement trees able to be planted & established with the aim of reducing gap distances between established tree canopies mostly within adjoining common boundary properties can only be specified once new tree species have been confirmed. I estimate the site would be able to support approximately four (4) new trees with the end result be an increase to present site tree canopy density. Note most trees proposed to be removed will never as Indi duals be true canopy trees hence the ease of creating increased canopy density with as few as four (4) at least medium size at maturity new trees.

“Suitable to the Local Environment New Tree Species List”

- *Allocasuarina littoralis, Black She Oak*
- *Banksia serrata, Old Man banksia*
- *Banksia integrifolia, Coast banksia*
- *Corymbis gummifera, Red Bloodwood*
- *Eucalyptus haemastoma, Scribbly bark Gum,*
- *Eucalyptus botryoides, Bangalay Gum*
- *Glochidion ferdinandi, Cheese Tree*

“Site Specific Tree Management Strategy”

Trees #1:

- *Retain & Manage*
- *Retain & Manage by implementation of best practice ‘cultural practices’.*

Trees #2:

- *Retain & Manage*
- *Retain & Manage by implementation of best practice ‘cultural practices’.*

Trees #3: Remove & Replace

Trees #4: Remove (mostly) & Replace

Trees #5: Remove & Replace

Tree #6: Remove & Replace

7 Conclusion

- **The DA submission with modified Landscape Concept & as lodged architectural plans for determination be re-considered by council officers as compliant relative to “NBC Tree Management Provisions” & the best practice “Site Specific Management Strategy” as outlined within this document.**

If you have any questions relating to this report or implementation of recommendations, please contact Kyle Hill on 0412-221-962.

Yours faithfully,



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

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, Growing My Way Tree Services, 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.

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, pp.

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

Dr. G. Watson & Dr. D. Neely, 'Trees & Building Sites', LSA Illinois USA 1995

Dr. N. Matheny & Dr. J.R. Clark, 'Trees & Development', ISA Illinois USA 1998

Phillip J. Craul, 'Urban Soil in Landscape Design', J. Wiley & Sons, New York USA 1992

11 Selected Bibliography

Hitchmough, J.D. 1994. 'Urban Landscape Management', Inkata Press, Sydney.

Mattheck, C. & Breloer, H. 1994 'Body Language of Trees', The Stationery Office, London.

AS 4373:2007, 'Pruning of Amenity Trees', Standards Australia.

AS 4970:2009, 'Protection of Trees on Development Sites', Standards Australia.

BS 5837:2005, 'Guide for Trees in Relation to Construction', Standards Board, UK.

Appendix A – Glossary

Glossary of common Arboreal terms

Age:	I	<i>Immature</i> 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 (ULE) refers to any individual tree specimen's potential life expectancy (viability) based on VTA assessment, three groups are described,

Short = Less than Five years

Medium = Five–Fifteen years

Long = more than Fifteen years

Significant diameter roots are defined as those being greater than 0.05m/50mm in diameter.

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

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

Primary Root Zone (PRZ) refers to a radial offset of ten (10) times the trunk DBH measured from the centre of the trunk. This zone often contains a significant amount of (but by no means all of a tree's) fine, non-woody roots required for uptake of nutrients, oxygen & water.

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