



# *Arboriculture Assessment & Management Statement*

April 2020

**Site:** Lot 1 in DP 588372  
9 Bate Avenue  
ALLAMBIE HEIGHTS, NSW|

**Client:** Vic Paice  
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**Commissioned:** Vic Paice

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Certificate Advanced Tree Care TAFE  
Founder -Growing My Way Tree Services (1977)  
Member of International Society of Arboriculture  
Member of Arboriculture Australia

# 1 Summary

Vic Paice (as the property owner) commissioned *Aura Tree Services Pty Ltd* to prepare an "Arboriculture Assessment & Management Statement" to be linked to the potential development within the subject site, i.e. Alterations/Additions & Secondary Dwelling.

The as briefed required to be assessed & discussed tree is an Australian Native tree species known as a Grey Gum, (*Eucalyptus punctata*). It is considered to be a locally indigenous tree species.

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

NBC is the sole consent authority relative to development & tree management within the subject site, 9 Bate Avenue, Allambie Heights.

The discussed tree is confirmed to be located within the subject site, loosely described as being towards the front (Bate Avenue) road reserve boundary & adjacent to an existing unpaved driveway area.

It is our opinion the discussed tree, based on onsite assessment of Wednesday, 26 August 2020 is a viable example (at least for the medium term) of its species. In this instance, 'medium term' is defined as being between five (5) & fifteen (15) years.

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'. The tree discussed is not a species within any-endangered ecological community listing. The discussed tree is not listed within any known "significant tree register".

From a Local Government Tree Management perspective, the discussed tree is 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'

This document supports the retention, with management of the discussed tree.

This scope of this document includes:

- NBC DA Tracking webtool for as lodged documents & communications from NBC,
- general site & tree assessment,
- tree condition assessment (i.e. present condition & probable Useful Life Expectancy),
- "Site Specific Plan of Management".

Kyle Hill, Practicing & Consulting Arborist AQF Level 5 & 8, has prepared this document based on onsite inspection (Wednesday, 26 August 2020).

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## 2 Introduction

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

The discussed tree is confirmed to be a long term established Grey Gum, (*Eucalyptus punctata*). It is confirmed to be locally indigenous tree species. It has been assessed as being a naturally occurring specimen. There is not conclusive evidence the discussed tree was present prior to the development of the subject site. NSW Department of Lands (SixMaps website tool) 1943 aerial photograph confirms the subject site to have trees present within its boundaries in 1943. There is evidence of a tree being located where the discussed tree is located in 1943.

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.

The subject site is Zoned R2 "Low Density Residential" (old Warringah Council LEP, 2011, Land Zoning Map-Sheet LZN\_007).

The discussed is not known to have been the subject of any previous management specifications by either council or a Practicing/Consulting Arborist.

The tree discussed is not assessed as being compromised at this point in time by recent changes to the natural soil level under the tree canopy. As such the discussed tree is not supported to be removed.

Any future development within the tree's calculated Tree Protection Zone radial distance will be required to additionally be compliant with the *Australian Standard (AS4970-2009 Protection of trees on development sites)*.

This document will specify the tree be monitored for any signs of active termite activity & change in appearance of its canopy. Multiple 'trunk/stem open wound sites display previous termite damage plus the likely presence of decay pathogen (fungal) organism damage. Monitor these wound sites for the appearance of 'fruiting bodies', commonly referred to as 'Bracket Fungi'. Should these appear the tree would likely require more in-depth assessment, i.e. Resistograph® of Sonic Tomograph (e.g. Picus® or Arbortom®) to quantify the presence of functional verses dysfunctional supporting wood tissues. (This is an expensive process & would not be undertaken unless council or consultant arborist specification to do so.)

Pruning at this point in time is not specified or assessed as being necessary.

Having made the previous paragraph/s comments, any 'live branch failure' of a significant diameter, i.e. greater than 75mm is considered to be an 'incident'. Incidents are most often caused by storm cells or less commonly on still days. (Still day 'live branch failures' are most commonly associated with a scientifically very poorly understood phenomena known as 'sudden or summer branch drop'.) Any tree that develops this characteristic with a shortening of failure frequency needs to be monitored, managed & sometimes even removed. The author of this document does not believe, based on information provided to date that the discussed tree comes anywhere near to fitting the criteria that would at this point in time equate to a problem tree. The tree is likely in excess of fifty (50) years old.

At this point in time, the discussed tree is not assessed as requiring any work relative to its ongoing management other than to monitor for canopy decline or the appearance of fungal 'fruiting bodies'.

The as calculated Tree Protection Zone (from herein TPZ) radial distance, total surface area plus Structural Root Zone (from herein SRZ) radial distances provide accurate management guidelines relative to any future development. (See Sections 5, 6 & 7 of this document.)

### 3 Methodology

Assessment of the trees has been by eye from ground level & aerial photography from multiple sources. Implementation of 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 any as lodged Tree Works Application submission.
- Discussion of environment where the tree is 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

\* **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

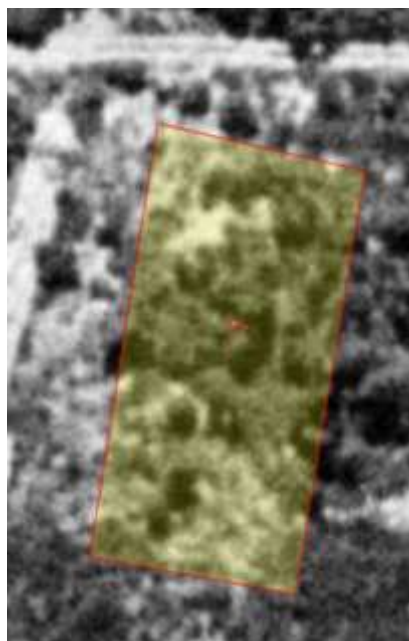
### 4.1 The Site

By NBC 'Property Search' website tool the total site area for the subject site is approximately 895.70m<sup>2</sup>.

The site is developed to contain a single dwelling residence with in ground rear yard swimming pool. The subject site & adjoining common boundary sites are also zoned R2 'Low Density residential'. The subject site shares common boundaries with three (3) developed properties. Motor vehicle & pedestrian access is only via Bate Avenue.

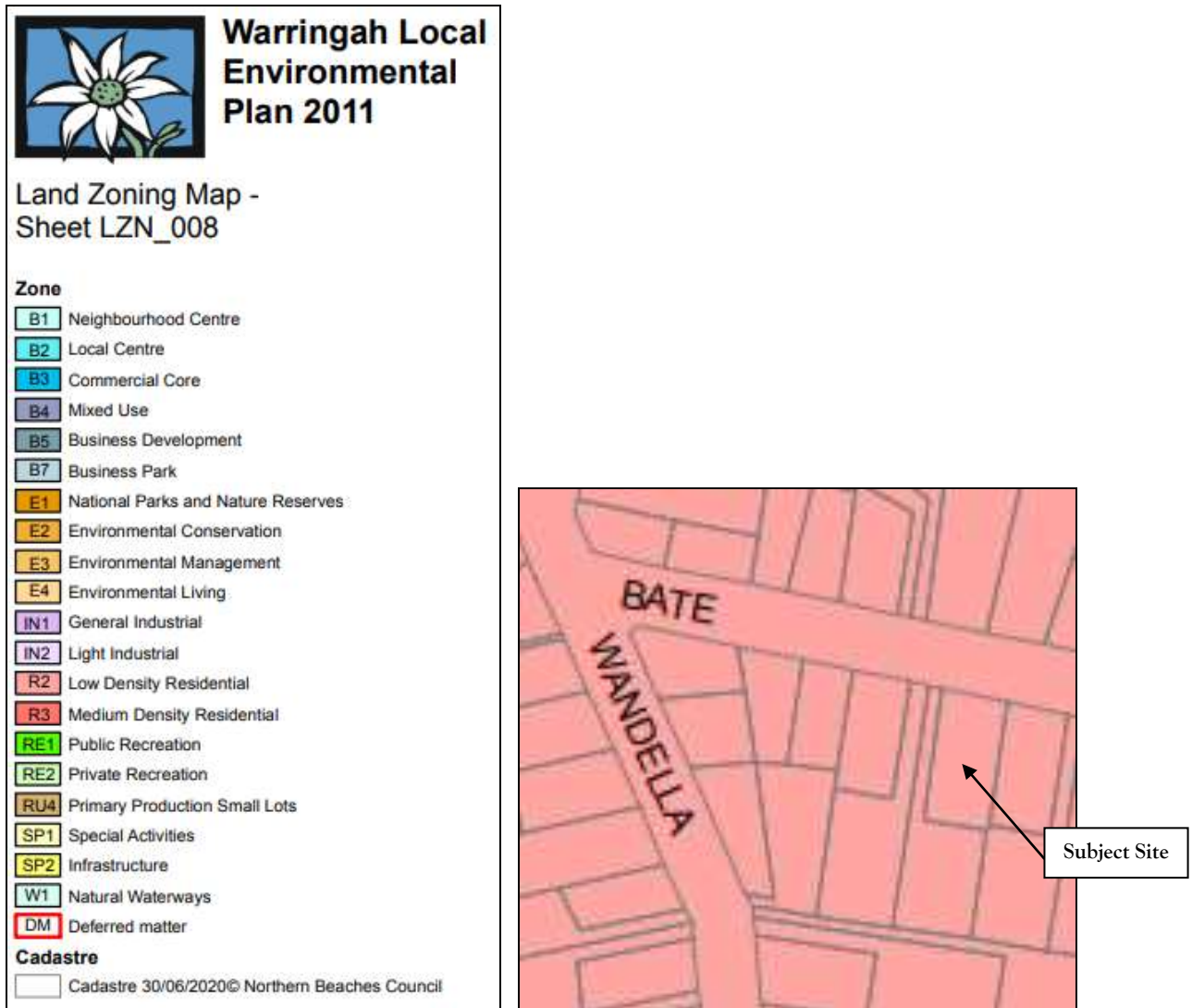


**Figure 1:** Location Map courtesy of NBC website tool. The below aerial photograph from 1943 (SixMaps) cannot confirm if the discussed tree was present or not present in 1943.

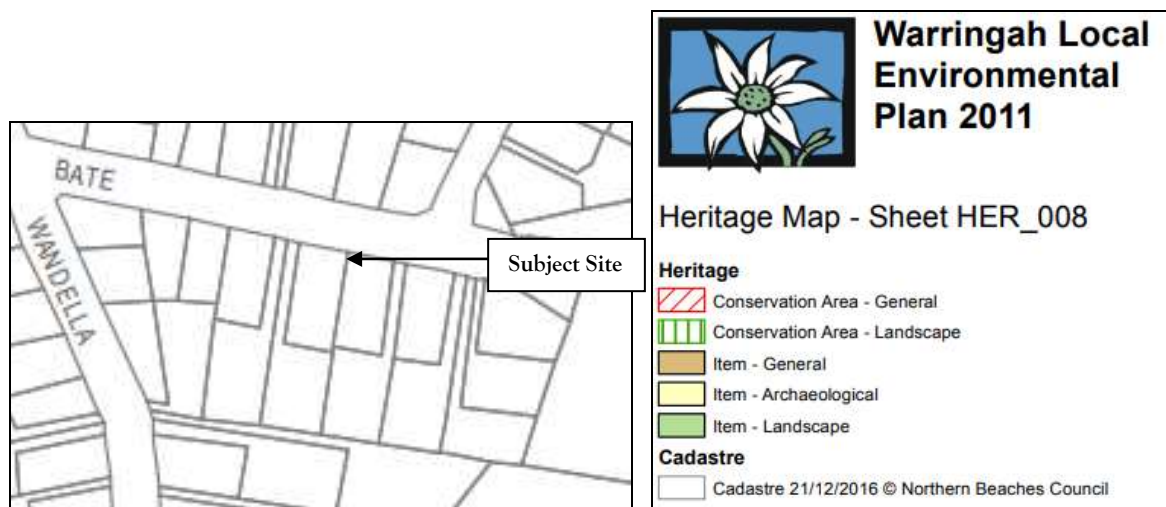




The subject site is NOT within an area noted to be a classified “Wildlife Corridor”. The discussed tree is not listed on any known “significant tree register”.



**Figure 2:** Confirms Land Zoning classification as being R2 ‘Low Density Residential’. Below confirms the subject site heritage Status.



## 4.2 The Tree Summary Table & Site/Tree Photographs

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

Trees Recommended for removal relative to site characteristics							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>Eucalyptus punctata</i> Grey Gum	<16.50	<15.00	0.73	8.76	3.15	M	Fair to Good / Fair to Good	High/High	Atypical, tree has co- dominant trunks/stems with broad open canopy	<b><u>Retain, Protect &amp; Manage:</u> Tree is considered as able to be retained for at least the medium term.</b>





Figure 3: Left illustrates the location of the tree, note changed soil levels/retaining wall. Right illustrates one of multiple old termite transport galleries.



Figure 4: Clockwise from top left, confirms altered soil levels/termite treatment sites, numerous open/sealed old wound sites with termite damage as well as decay pathogen damage, bottom middle & left illustrates likely 'fruiting body' emergence sites.





## 5 Discussion

It is perfectly normal for any tree, not just the tree subject to this document to replace all parts (leaves, flowers, fruit, bark branches & roots) over the long term. This is why live healthy trees are described as being dynamic.

The subject tree whilst not a veteran tree is certainly long term established, estimated to be in excess of fifty years old. The small diameter dead/dying branches noted throughout its canopy is again perfectly normal. On the basis that 'dead branch failures' are way more predictable than 'live branch failures' any pruning of this tree should focus only on the removal of the dead/dying branches.

Pruning (especially excessive pruning of woody branches of a medium to large diameter) has the potential to alter the tree's natural & long term developed branch architecture which in wind extremes act as 'mass dampeners'. This can easily be researched by looking at papers written by Dr Ken James (University of Melbourne, [https://www.researchgate.net/profile/Ken\\_James2/publication/27082\\_5https://minerva-access.unimelb.edu.au/bitstream/handle/11343/3574](https://www.researchgate.net/profile/Ken_James2/publication/27082_5https://minerva-access.unimelb.edu.au/bitstream/handle/11343/3574)).

The discussed tree in the previous short term (i.e. around twelve (12) months has been subjected to a change of natural (previously existing) soil levels. Whilst not of concern at the time of assessment this may compromise its Useful Life Expectancy (from herein ULE) over time. As discussed onsite, the tree appears to display better character relative to health & vigour in recent months, most likely a consequence of back to normal (even greater than normal) natural rainfall patterns.

Also discussed onsite was the probability that the front of the subject site will be re-developed to create a larger dwelling, new formal driveway/garage & possibly a secondary dwelling.

Any future development must address the definitions within the *Australian Standard (AS4970-2009 Protection of trees on development sites)*. This applies regardless of any future re-development being either a NBC determined Development Application or works under the CDC SEPP.

This tree has a calculated Tree Protection Zone (from herein TPZ) radial distance of 8.76m, (total TPZ surface area = 241.08m<sup>2</sup>). Its calculated Structural Root Zone (from herein SRZ) radial distance is 3.15m. (Relative to any future re-development both TPZ/SRZ radial distances would be measured from the tree trunk centre just above ground level.)

*AS4970-2009 allows a total surface area breach of up to 10%, i.e. 24.41m<sup>2</sup> (provided this area can be compensated for in other TPZ linked areas). This is defined as a 'Minor Encroachment'. A total surface area breach of between 11% & 20% (i.e. up to 48.82m<sup>2</sup>) is defined as being a 'Major Encroachment'. A 'Major Encroachment' can be supported if it can be demonstrated that any proposed works that breach the TPZ radial distance can be completed without damage to any supporting SRZ radial distance live woody root & minimal damage to TPZ smaller diameter.*

On this basis, the following is suggested:

- (i) Any formal surfacing of the existing compacted bare soil surface driveway within the TPZ radial of 8.76m from the tree trunk centre be constructed using 'tree root friendly' materials. Simply, permeable or pervious pavers/materials.
- (ii) Any construction of a permanent structure, e.g. a secondary dwelling within the TPZ radial of 8.76m from the tree trunk centre be constructed by suspending the structure so as to reduce ground level disturbance within its total TPZ surface area (241.08m<sup>2</sup>).  
Excavation within this area would need to be completed 'manually'. Any significant diameter 'live woody root' greater than 50mm (0.050m) in diameter exposed would ideally be avoided by simply moving the 'footing/pier site'. This is very common best Arboriculture Practice & is supported by both the engineering & building fraternities.
- (iii) The discussed tree would be isolated from any future works by the installation of temporary metal mesh fencing panels with above ground supports as to the as calculated TPZ radial distance of 8.76m.

All above stages would require formal documentation to be provided to the appointed Principle Certifying Authority. This is to be completed by the sites retained Practicing/Consulting Arborist with suitable qualifications but more importantly at least multiple years (minimum 4 to 5) experience of managing trees in a formal manner as opposed to a desktop manner.

## 6 Site Specific 'Tree Plan of Management'

### Tree #1:

- *Retain, Protect & Manage.*
- *Peruse any future plans once prepared so as to provide the required advice relative to viable tree retention in compliance with AS4970-2009 &/or any DA determined 'Conditions of Consent or CDC documentation.*
- *Document in writing with supporting photographic evidence any excavation process required.*
- *Reassess the tree relative to its Health & Vigour at least every 3 years, more often if still day 'live branch failures' occur or the tree can be visibly seen to be in a state of accelerated decline.*
- *The discussed tree is specified to be pruned on an as required basis, simply only removing dead/dying branches greater than 30mm in diameter. (See AS4373-2007 Pruning of amenity trees. See Chapter 7, Sections 7.1, 7.2 (plus subclauses) & 7.3 (plus subclauses).*
- *Any significant diameter 'live branch failure' incidents should be investigated immediately after the incident. (This must be completed &*

*documented with photographic evidence by an AQF level 5 or higher suitably experienced in Risk Management Practicing/Consulting Arborist.)*

- *Photograph the tree canopy prior to & post completion of any future construction works from as many angles as possible (minimum of 3) is recommended).*

## 7 Recommendations:

Manage the tree by application of the Discussion & Site Specific 'Tree Plan of Management' sections within this document.

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,



Kyle A Hill, Practicing & Consulting Arborist (AQF level 5 & 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 n 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', ISA Illinois USA 1995,
- Dr. N. Matheny & Dr. J.R. Clark, 'Trees & Development', ISA Illinois USA 1998 ,
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- 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

<b>Age:</b>	<b>I</b>	<i>Immature</i> refers to a refers to a well-established but juvenile tree
	<b>SM</b>	<i>Semi-mature</i> refers to a tree at growth stages between immaturity & full size
	<b>M</b>	<i>Mature</i> refers to a full sized tree with some capacity for further growth
	<b>LM</b>	<i>Late Mature</i> refers to a full sized tree with little capacity for growth that is not yet about to enter decline
	<b>OM</b>	<i>Over-mature</i> refers to a tree about to enter decline or already declining
	<b>LS</b>	<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 x 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

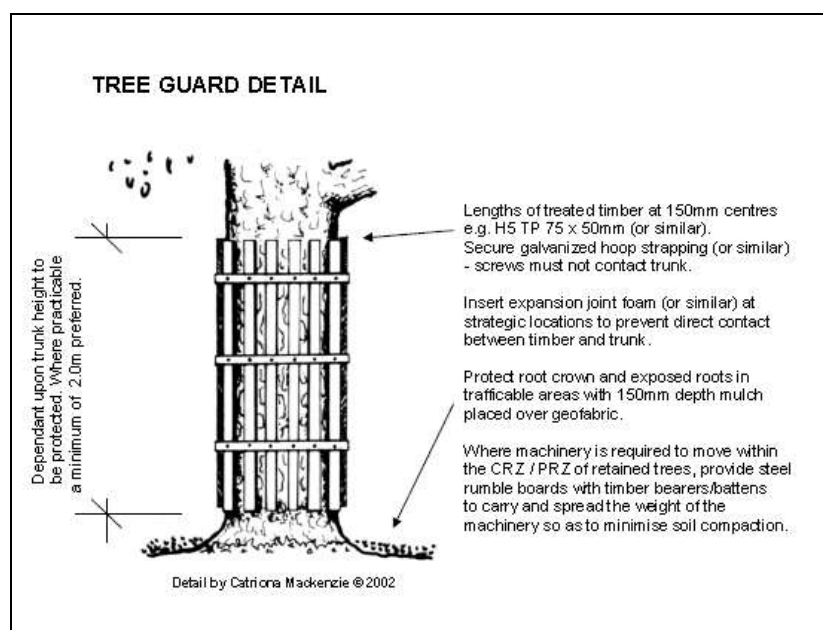
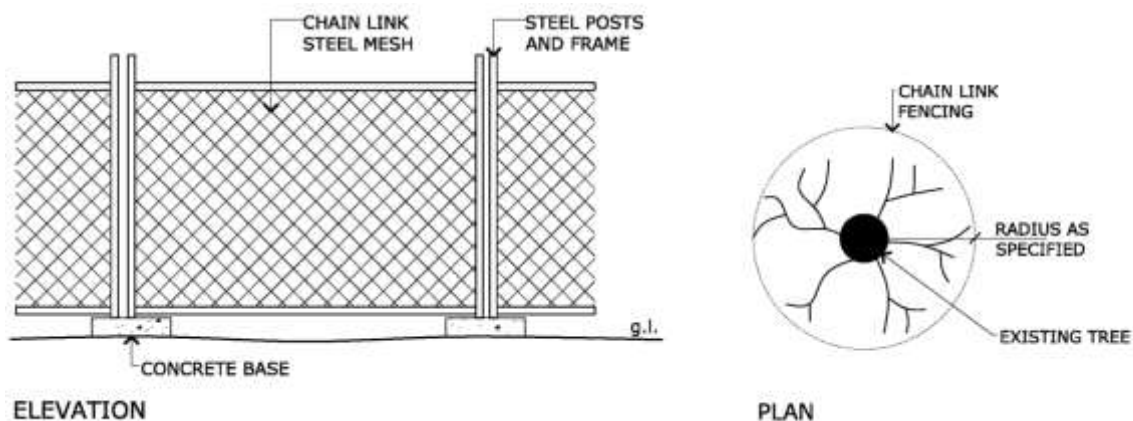
## Appendix B – Tree Protection/Management Prior to & During Construction

The installation of Tree Protection Zone (TPZ) fencing is to be carried out prior to commencement of all works. The most suitable fencing material is 1.8m tall chain link mesh with 50mm metal pole supports, see **detail 1: tree protection fencing**.

A mulch layer of composted leaf & woodchip to a depth of 75mm is required within the TPZ to aid in retention of soil moisture & to protect soil from contaminants. Water is to be applied by hand held or soaker/leaky hose within TPZ as required & in Accordance with Stage 2 Water Restrictions. Watering is to be carried out by either an Arborist or is to form part of the Builder's/Contractor's contract, with recommended monthly checks by an Arborist.

There is to be no stock piling of building material (including waste), machinery or any other item within TPZ of any retained tree. Access to personnel & machinery, & storage of fuel, chemicals, cement or site sheds is prohibited

Regular monitoring of protected trees during development works for unforeseen changes or decline, will aid in the success & longevity of the retained trees.





VARIOUS TREE ROOT FRIENDLY  
MODULAR PAVERS



## POROUS ASPHALT PAVEMENTS

**Porous asphalt is  
an environmentally  
friendly tool  
for stormwater  
management.**

In the natural environment, rainfall sinks into soil, filters through it, and eventually finds its way to streams, ponds, lakes, and underground aquifers. The built environment, by way of contrast, seals the surface. Rainwater and snowmelt become runoff which may contribute to flooding. Contaminants are washed from surfaces directly into waterways without undergoing the filtration that nature intended.<sup>1</sup>

Stormwater management tools can mitigate the impact of the built environment on natural hydrology. Unfortunately, however, they also can lead to unsound solutions such as cutting down stands of trees in order to build detention ponds.

Porous asphalt pavements allow for land development plans that are more thoughtful, harmonious with natural processes, and sustainable. They conserve water, reduce runoff, promote infiltration which cleanses stormwater, replenish aquifers, and protect streams.

A typical porous pavement has an open-graded surface over an underlying stone recharge bed. The water drains through the porous asphalt and into the stone bed, then, slowly, infiltrates into the soil. Many contaminants are removed as the stormwater passes through the porous asphalt, stone recharge bed, and soils through filtration and microbial action.

STONESET® BONDED  
PEBBLE PAVING SYSTEM

