



# **Arboricultural Impact Assessment**

## **Proposed Alterations & Additions at 90 Griffiths Street, Fairlight**

**Client:** Mr & Mrs Perrett

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**Author:** Alexis Anderson

**Qualifications:** -Diploma Horticulture (Arboriculture) –AQF Level 5.

-Bachelor of Applied Science (CM)

**Membership:** -Arboriculture Australia-Member No.2268

-International Society of Arboriculture –Professional Member

**A.B.N:** 989 613 015 96

**Contact:** 0431 286 080 [info@bluegumarborist.com.au](mailto:info@bluegumarborist.com.au)

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## 2 Summary

This Arboricultural Impact Assessment (AIA) is based on twenty two (22) trees located at 90 Griffiths Street, Fairlight (subject site). Alterations and additions to the existing dwelling including a new swimming pool and widened garage is proposed.

This swimming pool and driveway layout has been designed with Arborist collaboration to allow the best possible outcome for the retained trees.

This report aims to describe the likely impacts of the proposed works on the site trees and make recommendations to limit the potential for adverse impacts on trees recommended for retention.

The Retention Values of the subject trees were rated as outlined in the following Table. Refer to Figure A (following page) and the Tree Protection Plan (Attachment C) for tree locations.

**Table A:** Retention Values of the Subject Trees.

	<b>High Retention Value (Tree Number)</b>	<b>Medium Retention Value (Tree Number)</b>	<b>Low Retention Value (Tree Number)</b>
<b>To be Retained</b>	1	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22	-
<b>To be Removed</b>	-	-	-

All of the High and Medium Retention Value trees are able to be retained and remain viable in the long-term.

No trees are proposed to be removed. No impact on the environmental value or landscape amenity is expected.

There is excavation for the driveway crossover and swimming pool proposed within the Tree Protection Zones (TPZ) of Trees 1, 2, 16-22. Less than 10% of the TPZ areas of these trees will be affected. The trees are likely to tolerate the impact of these works. Recommendations have been made regarding tree protection measures to limit the potential for impact on the retained trees.

## 3 Introduction

### 3.1 Background

This Arboricultural Impact Assessment (AIA) was prepared for Mr & Mrs Perrett in relation to the existing trees and proposed alterations and additions at 90 Griffiths Street, Fairlight (subject site).

The purpose of this AIA is to assess the likely impacts of the proposed works on the existing site trees and make recommendations regarding construction methods and tree protection measures to limit adverse impacts on trees recommended for retention.

This AIA has been prepared in accordance with the Australian Standard 4970-2009, *Protection of trees on development sites*.

### 3.2 Subject Site/Proposed Works

The subject site is occupied by a two storey dwelling and garage. The majority of the subject trees are located in the front yard that is currently occupied by an open lawn with garden bed edges.

It is proposed to widen the existing garage and driveway and construct a new in-ground pool.

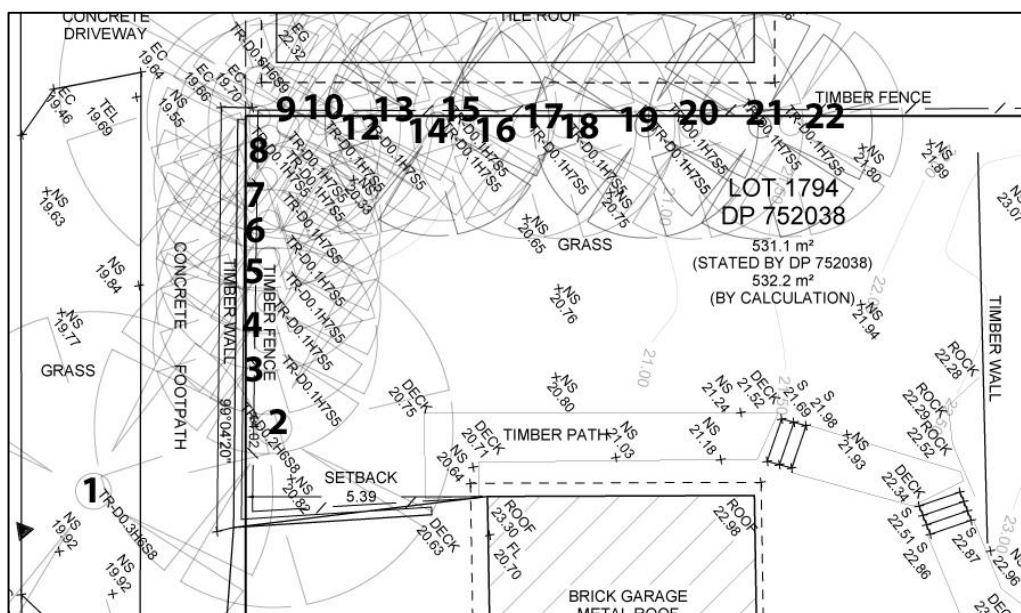
### 3.3 Subject Trees

All trees within 5m of the proposed works have been assessed. The tree population of the site is made up of planted exotics and planted Australian natives.

Trees 3-22 (Brush Cherry, *Syzygium australe*) had been recently topped to a height of 4.0m to encourage a low compact screening hedge.

Trees 2-22 are exempt from protection within the Northern Beaches LGA as they are less than 5.0m height.

Refer to Figure A below for tree locations and numbers. A detailed description of the subject trees is included in the Tree Assessment Table (Attachment A).



**Figure A:** Excerpt from the Survey Plan showing tree locations and numbering.





**Photo A: Tree 1**



**Photo B: Trees 2-22**

## 4 Methodology

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### 4.1 Site Inspection

Site inspection and tree assessment was undertaken on the 11<sup>th</sup> of May, 2021. The trees were assessed from ground level using a Tree Assessment Table, which is included as Attachment A. The definitions and explanations of terms used are outlined in the Tree Table Definitions page which is included at Attachment B.

The tree assessment was undertaken for the purpose of pre-development planning. Detailed tree risk assessment was not requested or included in the scope of works.

### 4.2 Arborist Co-ordination

Following the site inspection, the Architect was provided with advice about tree set-backs necessary to avoid major tree impacts. This information was incorporated into the final plan revision.

### 4.3 Plan Review

The set of plans provided by AH Design (Amendments B) were reviewed as part of this assessment. No Landscape Plans, Stormwater Plans or Structural Engineering Detail were available for review as part of this assessment.

### 4.4 Tree Protection Zones

Tree assessments in accordance with the Australian Standard 4970-2009, *Protection of trees on development sites*, require calculation of a Tree Protection Zone (TPZ) and Structural Root Zone (SRZ). The following is a brief explanation of these terms:

**Tree Protection Zone -TPZ:** This is the area that should be isolated from construction disturbance so that the tree remains viable. Some disturbance within the TPZ may be possible following arboricultural assessment.

**Structural Root Zone -SRZ:** This is the area of undisturbed soil and roots required to maintain tree stability. Excavation within the SRZ can lead to whole tree failure.

Refer to the Tree Assessment Table (Attachment A) for the Tree Protection Zones of the assessed trees.

### 4.5 Retention Values

Retention values are derived from a combination of Estimated Life Expectancy rating and Landscape and Environmental Significance ratings.

- **HIGH Retention Value:** These trees are worthy of retention and design consideration should be made where possible to allow their retention.
- **MEDIUM Retention Value:** These trees are worthy of retention and minor design consideration should be made to retain these trees wherever possible (e.g. placement of ancillary structures, stormwater pipes, garden retaining walls, driveway levels).
- **LOW Retention Value:** These trees should not be considered to be a constraint to design layout. Some of these trees should be removed irrespective of any proposed development.

The method of determining and defining retention values used in this report has been derived from the ©Retention Index developed by Tree Wise Men® Australia Pty Ltd.

#### **4.6 Consideration for Tree Retention and Removal**

Where demolition of existing structures, excavation or fill is proposed within the Tree Protection Zone (TPZ), arboricultural assessment and sensitive construction methods will be required. Where works are proposed outside of the TPZ, no sensitive construction methods are required.

Tree removal recommendations have been based on tree Retention Values and construction offsets.

Trees may generally be recommended for removal in the following circumstances:

- Trees located within construction footprints.
- Trees with construction proposed within SRZ where root loss cannot be avoided through sensitive design.
- Trees with a TPZ loss of more than 25%, may be recommended for removal providing tree sensitive design cannot be implemented to avoid significant root and canopy loss.
- Trees with low Retention Values may be recommended for removal irrespective of proposed development.



## 5 Potential Impacts of Proposed Works

### 5.1 Trees to be removed

No trees are proposed to be removed as part of this proposal.

### 5.2 Potential Impacts of Proposal on Retained Trees

Tree Number	Retention Value	Works proposed within the Tree Protection Zone (TPZ)
1	High	Shallow excavation for the driveway cross-over is proposed within the TPZ. This is to be outside of the Structural Root Zone and the encroachment will occupy less than 10% of the TPZ area. Some pruning of fine absorbing roots and woody transport roots may be required. It is likely that roots will be able to exist below the driveway depth. The tree is likely to tolerate the proposed works and remain viable in the long term.
2	Medium	Excavation for the widened driveway and retaining wall is proposed within the TPZ. Less than 10% of the TPZ area will be affected. Some pruning of fine absorbing roots and woody transport roots may be required. The tree is likely to tolerate the proposed works and remain viable in the long term.
13, 14, 15	Medium	The proposed pool pump and filter box is proposed within the TPZ. It will be possible to install the base slab entirely above existing levels with undamaged roots beneath. No notable impact is expected.
16, 17, 18, 19, 20, 21, 22	Medium	Excavation for the swimming pool is proposed within the TPZ. All excavation will be outside of the Structural Root Zone and occupy less than 10% of the TPZ area. It is likely that pruning of fine absorbing roots and woody transport roots may be required. The health and longevity of these trees is unlikely to be compromised by the root pruning.

**Incidental Impacts:** There is the potential for incidental/accidental damage to the trunk, canopy and shallow roots of all retained trees throughout the construction process. Trees are commonly impacted on construction sites in the following ways.

- Stripping of topsoil and removal of organic material from the soil surface.
- Compaction of the topsoil and damage to surface roots through use of heavy machinery and frequent foot traffic.
- Soil contamination through washing out barrows and disposal or spillage of chemical materials.
- Root loss due to unforeseen excavation for plumbing upgrades and landscape construction.
- Bark/trunk and branch injuries from accidental contact with machinery.



These impacts can be easily avoided through communication with building contractors and basic tree protection measures.

## 6 Recommendations

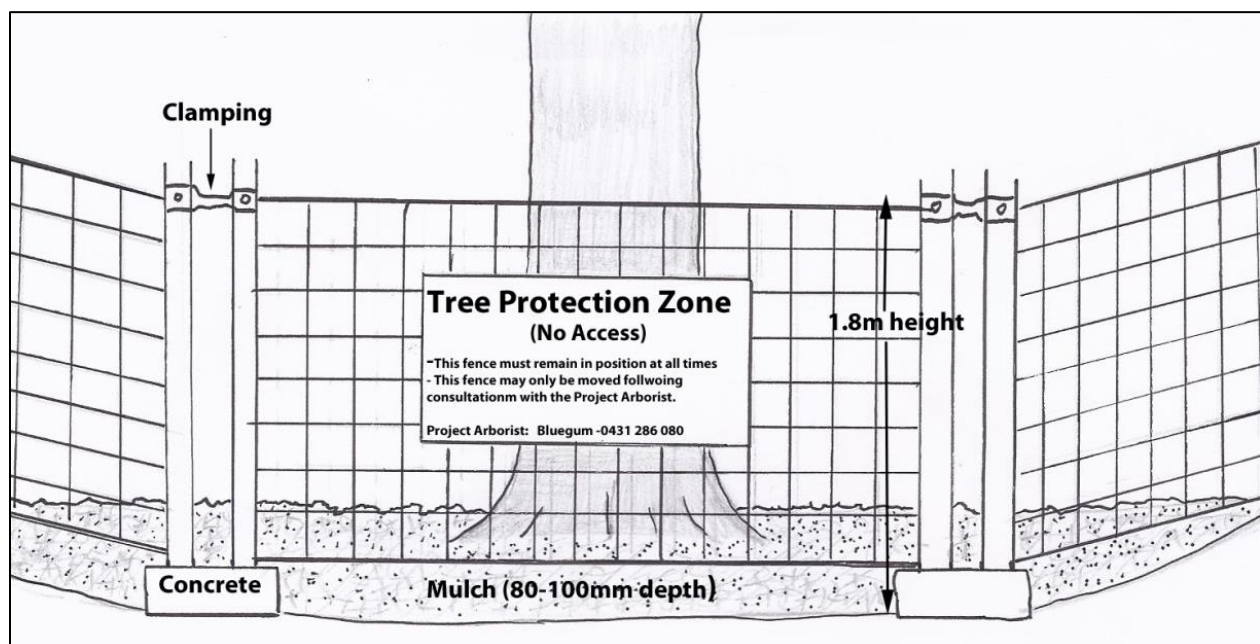
### 6.1 Site Establishment –Prior to Construction

**Appointment of a Project Arborist:** An Arborist with an AQF Level 5 qualification in Arboriculture and experience in tree protection within construction sites should be engaged prior to the commencement of work on the site. The Project Arborist should be present at the following times:

- Project Commencement to meet with the Site Foreman and discuss tree protection requirements.
- Following installation of tree protection fencing and ground protection.
- At project completion to verify tree protection and retention.

**Tree Protection Fencing:** Tree Protection Fencing should be installed prior to any machinery or materials being brought on site and remain in position throughout the entire project. Tree Protection Fencing should be erected around the Tree Protection Zones as defined in the Tree Protection Plan (Attachment C). Tree Protection Fencing should consist of 1.8 metre high chainlink panels on moveable concrete pads. Tree Protection Fencing should be clamped at each panel junction.

Tree Protection Fencing should not be moved at any time without consultation with the Project Arborist. An example of adequate tree protection fencing is detailed below.



**Figure B:** Example of adequate tree protection fencing

## 6.2 During Construction

**Tree Protection Zones:** Refer to the Tree Assessment Table (Attachment A) for the spread of TPZ's of trees nominated for retention. The following should be prohibited within the Tree Protection Zones:

- Stripping of topsoil or organic surface material outside of the construction/pool footprints.
- Storage of material, vehicles and machinery.
- Disposal of solid, liquid or chemical waste.
- Any excavation, fill or other construction activity other than that discussed in this report.

**Excavation for the Driveway Crossover (Tree 1):** Shallow excavation for the driveway crossover is proposed within the TPZ of Tree 1. Prior to machine excavation, hand trenching should be undertaken along the western edge of the crossover. The area where this is recommended is outlined on the Tree Protection Plan (Attachment C). All tree roots encountered within the trench should be cleanly cut using a sharp saw or secateurs. The purpose of this is to minimise the surface area of pruning wounds and avoid additional root damage (tearing/splintering) that typically occurs when roots are pruned using an excavator.

**Excavation for the Swimming Pool (Trees 16-22):** Prior to machine excavation, hand trenching should be undertaken to a depth of 50cm along the western edge of the pool. The area where this is recommended is outlined on the Tree Protection Plan (Attachment C). All tree roots encountered within the trench should be cleanly cut using a sharp saw or secateurs. The purpose of this is to minimise the surface area of pruning wounds and avoid additional root damage (tearing/splintering) that typically occurs when roots are pruned using an excavator.

## 6.3 Post Construction Tree Care

At the completion of the project, the retained trees should be inspected by the Project Arborist. Depending on the health and vitality of retained trees, the Project Arborist may prescribe some remedial tree care. This may include installation of temporary or permanent irrigation, application of soil conditioners, compost application, fertiliser application and installation of mulch.

# 7 Statement of Impartiality

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- This report prepared by Bluegum Tree Care & Consultancy (BTCC) reflects the impartial and expert opinion of Alexis Anderson.
- BTCC is acting independently of and not as the advocate for the owners of the subject trees.
- BTCC does not undertake tree pruning and removal works and will not have any involvement with pruning or removing trees which are the subject of this report.

## 8 Limitations

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- The findings of this report are based upon and limited to visual examination of trees from ground level without any climbing, internal testing or exploratory excavation.
- The tree assessment was undertaken for the purpose of pre-development planning. Detailed tree risk assessment was not requested or included in the scope of works.
- This report reflects the health and structure of trees at the time of inspection. Bluegum cannot guarantee that a tree will be healthy and safe under all circumstances or for a specified period of time. There is no guarantee that problems or defects with assessed trees, will not arise in the future. Liability will not be accepted for damage to person or property as a result of failure of assessed trees.

Tree No.	Common Name/ Genus Species	Trunk Diameter (mm)	Height (m)	Canopy Spread Radius (m)	Age Class	Health / Vitality	Structural Condition	Tree Protection Zone (m)	Structural Root Zone (m)	Estimated Life Expectancy (ELE)	Landscape and Environmental Significance	Retention Value	Comments	Likely Construction Impacts	Proposed Action.
1	Peppercorn Tree, <i>Schinus mollee</i>	24	7	3	EM	G	G	2.9	2.0	Long (30+ yrs)	2	High	Street tree. This species is planted consistently across this street.	Excavation for the driveway crossover is proposed within the TPZ.	Retain.
2	Camellia, <i>Camellia sasanqua</i>	10, 9, 8, 7	4	3	M	G	G	2.0	1.5	Long (30+ yrs)	3	Medium		Excavation for the driveway and retaining wall is proposed within the TPZ.	Retain.
3	Brush Cherry, <i>Syzygium australe</i>	8	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
4	Brush Cherry, <i>Syzygium australe</i>	9	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
5	Brush Cherry, <i>Syzygium australe</i>	10	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
6	Brush Cherry, <i>Syzygium australe</i>	10	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
7	Brush Cherry, <i>Syzygium australe</i>	10	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
8	Brush Cherry, <i>Syzygium australe</i>	10	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
9	Brush Cherry, <i>Syzygium australe</i>	11	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
10	Brush Cherry, <i>Syzygium australe</i>	12	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
11	Brush Cherry, <i>Syzygium australe</i>	12	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
12	Brush Cherry, <i>Syzygium australe</i>	12	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	Nil.	Retain.
13	Brush Cherry, <i>Syzygium australe</i>	12	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ.	Retain.
14	Brush Cherry, <i>Syzygium australe</i>	13	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ.	Retain.
15	Brush Cherry, <i>Syzygium australe</i>	13, 9	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ.	Retain.
16	Brush Cherry, <i>Syzygium australe</i>	14	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ. Excavation for the swimming pool is proposed within the TPZ.	Retain.
17	Brush Cherry, <i>Syzygium australe</i>	13	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ. Excavation for the swimming pool is proposed within the TPZ.	Retain.
18	Brush Cherry, <i>Syzygium australe</i>	15	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ. Excavation for the swimming pool is proposed within the TPZ.	Retain.
19	Brush Cherry, <i>Syzygium australe</i>	12	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ. Excavation for the swimming pool is proposed within the TPZ.	Retain.
20	Brush Cherry, <i>Syzygium australe</i>	14	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ. Excavation for the swimming pool is proposed within the TPZ.	Retain.
21	Brush Cherry, <i>Syzygium australe</i>	16	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ. Excavation for the swimming pool is proposed within the TPZ.	Retain.
22	Brush Cherry, <i>Syzygium australe</i>	15	4	2	M	F	F	2.0	1.5	Medium (10-30 yrs)	3	Medium	Recent canopy top pruning to 4m height.	The pump and filter box is proposed within the TPZ. Excavation for the swimming pool is proposed within the TPZ.	Retain.

## Attachment B: TREE ASSESSMENT DEFINITIONS

**Height.** Tree height is estimated from ground level. This assessment is made independently of data plotted on survey plan. These measurements have not been confirmed with clinometer or other surveying instrument.

**Diameter at Breast Height (DBH).** Trunk diameter is measured at 1.4 metres above ground level. A diameter tape is used which calculates the diameter from a measurement of the circumference. DBH is primarily used for the calculation of the TPZ. The trunk diameter above the root buttress is measured to calculate the Structural Root Zone. If a tree has more than 4 trunks, the diameter of the four largest trunks is recorded. For irregular trunk formations the DBH is calculated as outlined in Appendix A of AS4970-2009 - *Protection of Trees on Development Sites*.

**Canopy Spread Radius.** Average canopy spread radius is estimated from the centre of trunk to the outer edge of canopy. Refer to Comments column for detail of heavily skewed canopy spread.

**Age Class -** This is an estimation of the tree's current age class based on size, growth habit, local environmental conditions and comparison with surrounding trees.

- **Immature (IM):** This is a juvenile specimen that is likely to have germinated within the previous 5 years.
- **Early Mature (EM):** This is a tree that is established within its growing environment, though has not reached an age of reproductive maturity or the natural growth habit of a mature individual.
- **Mature (M):** This is a tree has reached both reproductive maturity and a physical form and shape typical for the species. Trees can have a Mature Age Class for the majority of their life span.
- **Late-Mature (LM):** These trees show early signs of senescence with symptoms such as reduced canopy density and an accumulation of dead branches.
- **Over-mature (OM):** These trees show symptoms of irreversible decline such as canopy dieback with dead branches concentrated in the upper canopy.

**Health/Vitality- Good (G), Fair (F) or Poor (P).** This is primarily based on the extent of vigorous new foliage growth at branch tips and the colour, size and density of foliage generally. The percentage of live branches to dead branches is considered. The location of any dead branches is also considered. The presence of any pest or disease is considered as part of this assessment. Health can vary with climatic conditions.

**Structural Condition - Good (G), Fair (F) or Poor (P).** This is an assessment of tree structure and stability. Root anchorage, trunk lean, structural defects, canopy skew and any hazardous features are considered. Dead branches can be considered as part of Structural Condition if they are of a size and location that could cause injury or property damage.

**Tree Protection Zone (TPZ).** This is a radial distance of (12X) the DBH measured from centre of trunk. TPZ is rounded to the nearest 0.1 metre. A TPZ should not be less than 2m or greater than 15m. The TPZ for palms and other monocots should not be less than 1m outside of the crown projection. Existing constraints to root spread can vary the TPZ. For a tree to remain viable, construction activity should be excluded or undertaken with care within the TPZ. Disturbance within up to 10% of the TPZ area is considered to be a minor encroachment. Disturbance to more than 10% of the TPZ area is considered a major encroachment. Major encroachment into the TPZ is possible depending on the type of disturbance, and species tolerance to disturbance. Exploratory excavation may be required to quantify the presence of roots at the alignment of proposed ground disturbance. This is based upon the Australian Standard AS 4970, 2009, *Protection of trees on development sites* and the Matheney & Clarke "Guidelines for adequate tree preservation zones for healthy, structurally stable trees".

**Structural Root Zone (SRZ).** This is a radial distance based on the following formula-  $SRZ = (D \times 50)^{0.42} \times 0.64$  (for trees less than 150mm Diameter, a minimum SRZ of 1.5 metres). The **D** in the formula is the trunk diameter measured above the root buttress. This was recorded in the field notes. SRZ measurements are rounded to the nearest 0.1m. The Structural Root Zone is the area of soil and roots required to maintain tree stability. Excavation within the SRZ can result in whole tree failure. Fully elevated construction is possible within SRZ with specific rootzone assessment. Existing constraints to root spread can vary the SRZ. This method of determining SRZ is outlined at Section 3.3.5 of Australian Standard AS 4970, 2009, *Protection of trees on development sites*.



**Estimated Remaining Life Expectancy:** This gives a length of time that the Arborist believes a particular tree can be retained from the time of assessment with an acceptable level of risk based on the information available at the time of the inspection. This system of rating does not take into consideration the likely impacts of any proposed development. Ratings are **Long** (retainable for 30 years or more with an acceptable level of risk), **Medium** (retainable for 10-30 years), **Short** (retainable for 0-10 years) and **Removal** (tree requiring removal due to risk/hazard or absolute unsuitability).

**Landscape & Environmental Significance\*.** This is an assessment of the impact of the tree on the surrounding landscape amenity and natural environment. Rarity, habitat value, physical prominence, historical and cultural significance of the tree are considered in this rating system. The Landscape & Environmental Value ratings used in this report are:

**1. Very High Value:** This is an outstanding specimen that holds irreplaceable environmental, landscape or cultural value.

**2. High Value:** An excellent specimen that holds environmental, landscape or cultural value that is present in other site trees or that could be replaced.

**3. Moderate Value:** Can be a good to fair specimen with environmental, landscape or cultural value that is common within other trees in the locality.

**4. Low Value:** Removal would not result in any loss of site amenity or environmental value. Can include undesirable or weed species or trees growing in unsuitable locations.

**5. Very Low Value:** Dead or hazardous with no other environmental or cultural value. Could also include weed species. These trees should be removed or pruned in a way to make safe irrespective of any development.

**\*Note:** The concept of using a five (5) point scale to assess tree significance was derived from the Tree Wise Men® Australia Pty Ltd ©Significance Rating Scale.

**Retention Value\*.** Retention values are derived from a combination of Estimated Life Expectancy rating and Landscape and Environmental Significance ratings.

Landscape & Environmental Significance		Estimated Life Expectancy			
		Long	Medium	Short	Removal
	Very High (1)	HIGH		MEDIUM	
	High (2)				
	Medium (3)	MEDIUM		LOW	
	Low (4)				
	Very Low (5)				

**HIGH Retention Value:** These trees are worthy of retention and major design consideration should be made where feasible to allow this.

**MEDIUM Retention Value:** These trees are worthy of retention and minor design consideration should be made to retain these trees wherever possible (e.g. placement of ancillary structures, garden retaining walls, driveway levels).

**LOW Retention Value:** These trees should not be considered to be a constraint to design layout. Some of these trees should be removed irrespective of any proposed development.

**\*Note:** The method of determining and defining retention values used in this report has been derived from the ©Retention Index developed by Tree Wise Men® Australia Pty Ltd.

