Arboricultural Impact Assessment

Proposed Alterations & Additions at

57 Lantana Avenue, Wheeler Heights

Date: November 2022
Client: Victor Pismensky
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

1 Contents

2 Introduction

2.1 Background

This Arboricultural Impact Assessment (AIA) was prepared for Victor Pismensky in relation to the existing trees and proposed alterations and additions at 57 Lantana Avenue, Wheeler Heights.

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

This AIA has been guided by the principles set out in the Australian Standard 4970-2009, *Protection of trees on development sites.*

2.2 Subject Site/Proposed Works

The subject site is currently occupied by a single storey dwelling with front and rear yard free of built structures. The proposed works include alterations and additions to the existing building additions, new carport, studio and swimming pool.

2.3 Subject Trees

All trees on the site have been assessed. Refer to Figure A (following page) for tree locations. These are made up of the following species:

- Umbrella Tree, *Schefflera actinophylla* (Tree 1)
- Weeping Fig, *Ficus banjamina* (Tree 2)
- Cheese Treee, *Glochidion ferdinandi* (Tree 3)
- Bangalay, *Eucalyptus botryoides* (Tree 4)
- Cotoneaster, *Cotoneaster sp.* (Tree 5)

Trees 3 and 4 are protected under SEPP (Biodiversity & Conservation) 2021. Trees 1, 2 and 5 are listed as exempt species within Northern Beaches DCP and are not protected within the LGA.

A detailed description of the subject trees is included in the Tree Assessment Table (Section 4 –page 6).

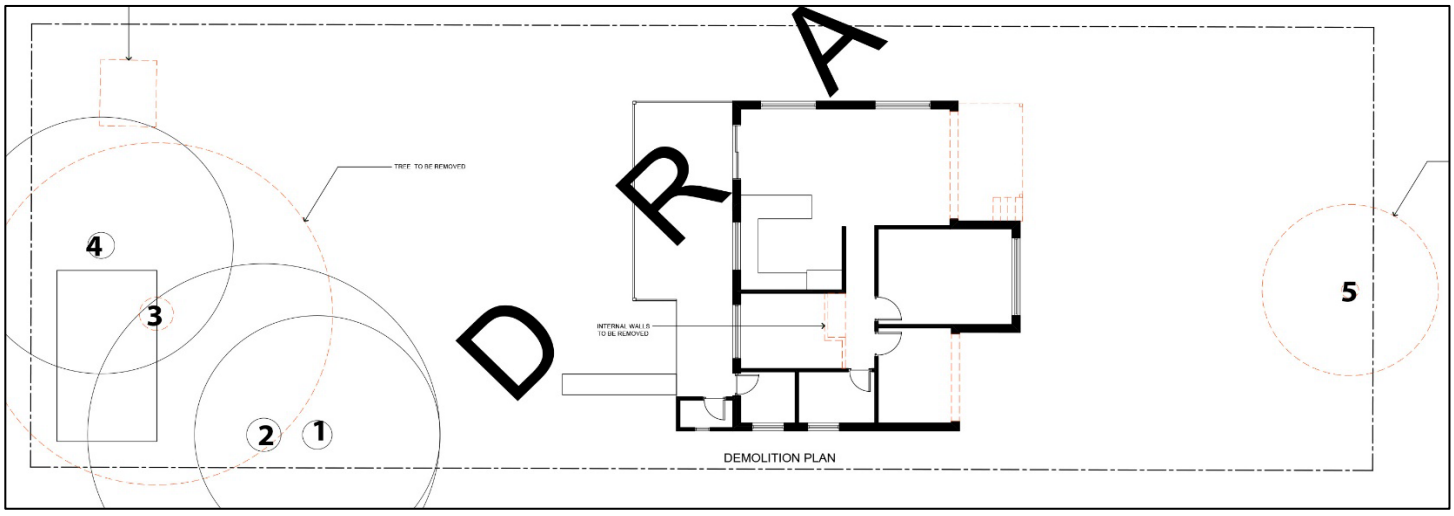


Figure A: Excerpt from the Demolition Plan showing the tree locations and numbering.

3 Methodology

3.1 Site Inspection/Tree Assessment

Site inspection and tree assessment was undertaken by Alexis Anderson on the 22nd of September, 2022. The trees were assessed from ground level using a Tree Assessment Table, as outlined in Section 4. The definitions and explanations of terms used are outlined in the Tree Table Definitions page which is included at Attachment A.

3.2 Plan Review

This report is based upon a review of the set of plans provided by Corona Projects (September 2022).

No Landscape Plan, Hydraulics Plans or Engineering Detail was available for review at the time of assessment.

3.3 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.

3.4 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. Removal of these trees will have an impact on the landscape amenity or local environment.
- **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). Removal of these trees will not have a significant impact on the landscape amenity or local environment.
- **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.

3.5 Consideration for Tree Retention and Removal

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 the 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.

4 Tree Assessment Details

4.1 Tree Assessment Table

	Species	Trunk Diameter @ 1.4m	Height	Canopy Spread Radius	Age Class	Health/ Vitality	Structural Condition	Estimated Life Expectancy	Landscape and Environmental Significance	Retention Value
1	Umbrella Tree, *Schefflera actinophylla*	20cm, 20cm, 15cm, 15cm	8m	2m	Mature	Good	Good	Long (30+ yrs)	4	Low
		Comments: Weed species. Exempt from protection within the Northern Beaches LGA.								
2	Weeping Fig, *Ficus benjamina*	35cm, 30cm, 30cm, 25cm	11m	7m	Mature	Good	Good	Long (30+ yrs)	3	Medium
		Comments: Shallow roots visible on the surface. Exempt from protection within the Northern Beaches LGA.								
3	Cheese Tree, *Glochidion ferdinandi*	41cm	8m	6m	Mature	Good	Good	Long (30+ yrs)	3	Medium
		Comments: Locally native species. Likely to have self-sown.								
4	Bangalay, *Eucalyptus botryoides*	44cm	13m	5m	Mature	Good	Good	Long (30+ yrs)	3	Medium
		Comments: Locally native species. Likely to have self-sown. Shallow roots are visible on the surface.								
5	Cotoneaster, *Cotoneaster sp.*	8cm, 8cm, 8cm, 8cm	3m	3m	Mature	Good	Good	Long (30+ yrs)	4	Low
		Comments: Weed species. Likely to have self sown. Exempt from protection within the Northern Beaches LGA.								

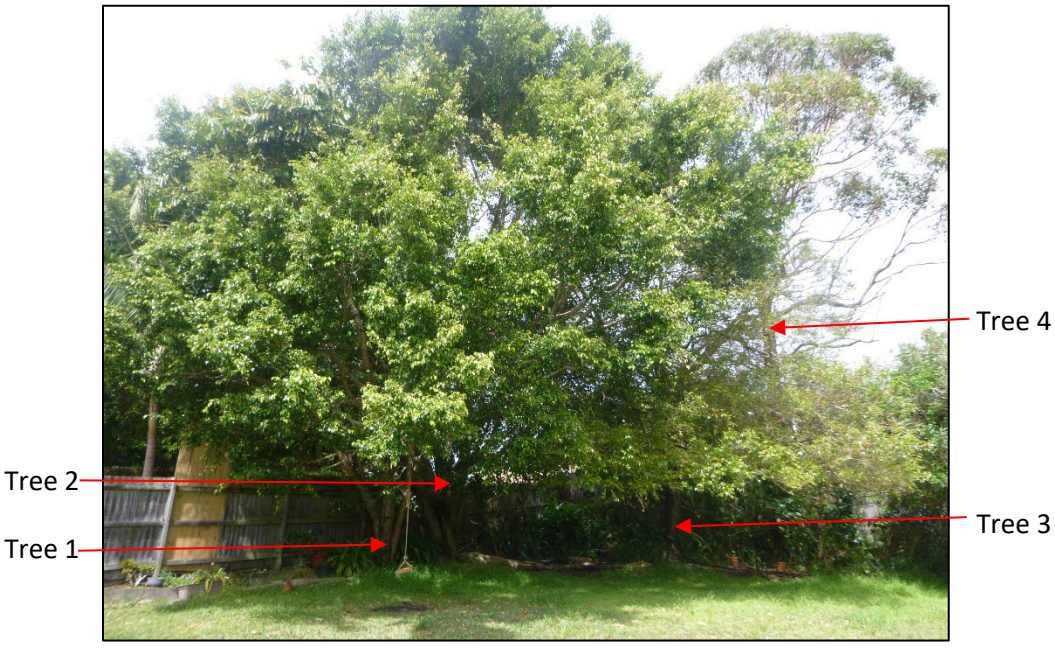


Photo A: Trees 1-4.

Photo B: Trees 3 and 4.

Photo C: Area of the proposed studio. Trees 3 and 4.

4.2 Tree Protection Zones

Tree Protection Offsets based on AS4970-2009-*Protection of Trees on Development Sites*		
Tree Number	**Tree Protection Zone radius**	**Structural Root Zone radius**
1	4.2	2.1
2	7.2	2.7
3	4.9	2.3
4	5.3	2.4
5	3.0	1.0

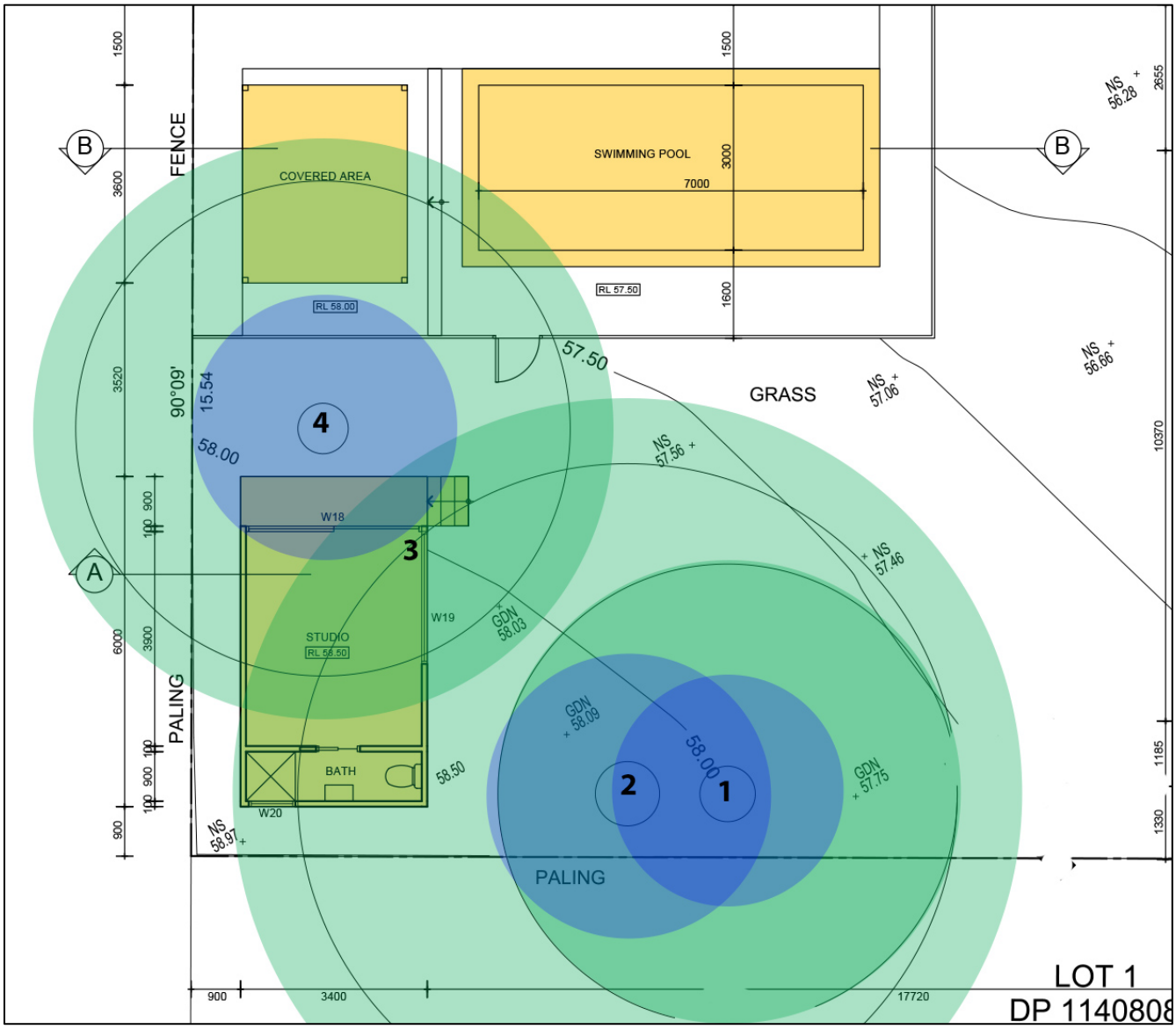


Figure B: Excerpt from the Proposed Ground Floor plan showing the TPZ (green lines) and SRZ (blue lines) of the retained trees.

5 Potential Impacts of Proposed Works

5.1 Trees Proposed for Removal

Tree Number/Species	Retention Value	Reason for Proposed Removal
1 Cheese Tree	Medium	Within the proposed studio footprint. There were not suitable alternative design layouts that would allow retention of this tree.
5 Cotoneaster	Low	Recommended for removal irrespective of the proposed works as it is an invasive weed species.

5.2 Potential Impacts of Proposed Works on Retained Trees

Tree Number/Species	Retention Value	Works Proposed Within the Tree Protection Zone (TPZ)
2 Weeping Fig	Medium	The proposed studio shall occupy approximately 10-15% of the TPZ area. The majority of the studio building shall be elevated above existing ground levels with excavation limited to the isolated pier footings. It will be possible for tree roots to exist beneath the building. No impact is expected.
4 Bangalay	Medium	The proposed studio shall occupy part of the Structural Root Zone and approximately 15-20% of the TPZ area. The majority of the studio building will be elevated above existing ground levels with excavation limited to the isolated pier footings. It will be possible to space the piers to clear the structural roots (refer to the recommendations). It will be possible for tree roots to exist beneath the building. The proposed pool covered area is to be constructed above existing within the TPZ. Approximately 15% of the TPZ area will be covered. Details of the floor construction were not shown on the plans however it will be possible for tree roots to exist beneath either slab or timber deck. A total of 30-35% of the TPZ shall be covered by elevated structures. Considering that tree roots will be able to exist beneath the structures, it is likely that tree will tolerate the changes and remain viable in the long-term. Excavation for the new swimming pool shall occupy less than 5% of the TPZ area. Some pruning of woody transport roots and fine absorbing roots may be required. This tree is likely to adapt to the reduced volume of available soil with no notable long-term impact.

Incidental Impacts: Trees are commonly impacted on construction sites in the following ways. These impacts can be easily avoided through awareness and basic tree protection measures.

- Stripping of existing ground cover, 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.

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. This must include protective covering for surface roots of Tree 4.
- Following installation of trunk protection, ground protection and surface root covering.
- During setting out of studio/covered area footings.
- At any time that tree roots greater than 40mm diameter are required to be pruned.
- At project completion assess the retained trees and to document/certify tree protection and retention.

Trunk and Ground Protection (Trees 1, 2, 4): Trunk and ground protection are recommended for Trees 1, 2 and 4). Ground protection is aimed at preventing soil compaction, soil contamination, damage to surface roots and disruption of the natural soil profile. Additional protective covering of surface roots must also be prescribed by the Project Arborist.
Trunk battening is aimed at preventing accidental bark wounds as often occurs on construction sites where machinery is used and materials are being moved.
Refer to Figure C below for specification of trunk and ground protection.

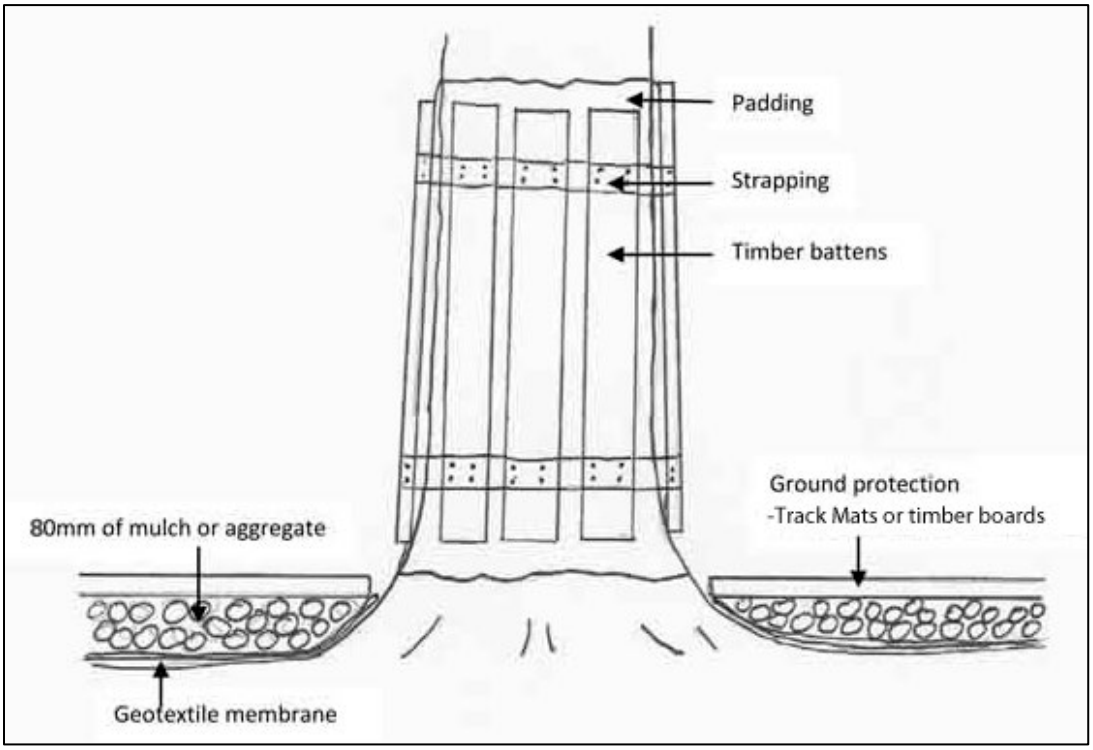


Figure C: Detail of adequate trunk and ground protection.

Tree Removal: Two (2) trees are proposed to be removed as part of the project. Tree removal contractors should be briefed on the need to protect retained trees during tree removal operations. Mulch collected from the tree removals should be spread on-site within the Tree Protection Zones.

6.2 During Construction

Tree Protection Zones: The following should be prohibited within Tree Protection Zones of the assessed trees:

- Removal or stripping of topsoil / organic surface material.
- Landscape works involving retaining walls or ground levelling.
- Disposal of solid, liquid or chemical waste.
- Any excavation, fill or other construction activity other than that discussed in this report.

Positioning of Studio Pier Footings: Large structural roots from Tree 4 are visible on the surface above the sandstone rock shelf. These roots are critical for ground anchorage and must not be injured. It is essential that the pier footings are spaced to clear all tree roots greater than 40mm diameter. The studio design must allow for the possibility of flexible pier locations. The Project Arborist should be invited to site to verify the spacing of piers to clear structural roots.

Covered Pool Area Footings: The footings (deck or slab) must be spaced to clear all tree roots greater than 40mm diameter.

Landscaping Works: The existing ground levels must be maintained within the TPZ's of Trees 1, 2 and 4. There must be no ground levelling or soil stripping. Mulched garden beds are preferable to lawn or pavement.

6.3 Post Construction Tree Care

At the completion of the project, all retained trees should be inspected by an AQF Level 5 Arborist. Depending on the health and vitality of retained trees, the 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

- 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

- 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.
- 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.
- 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.

Attachment A: 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.

Trunk Diameter. 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 circumfrence. DBH is primarily used for the calculation of the TPZ and SRZ.
If a tree has more than 4 trunks, the diameter of the four largest trunks is recorded. For irregular trunk formations the Trunk Diameter 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)**: There 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 x 50) $^{0.42}$ x 0.64** (for trees less than 150mm Diameter, a minimum SRZ of 1.5 metres). 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.

<table>
<tr><td rowspan="6">Landscape & Environmental Significance</td><td></td><td colspan="4">Estimated Life Expectancy</td></tr>
<tr><td></td><td>Long</td><td>Medium</td><td>Short</td><td>Removal</td></tr>
<tr><td>Very High (1)</td><td colspan="2" rowspan="2">HIGH</td><td rowspan="2">MEDIUM</td><td rowspan="2"></td></tr>
<tr><td>High (2)</td></tr>
<tr><td>Medium (3)</td><td colspan="2">MEDIUM</td><td rowspan="3" colspan="2">LOW</td></tr>
<tr><td>Low (4)</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>Very Low (5)</td></tr>
</table>

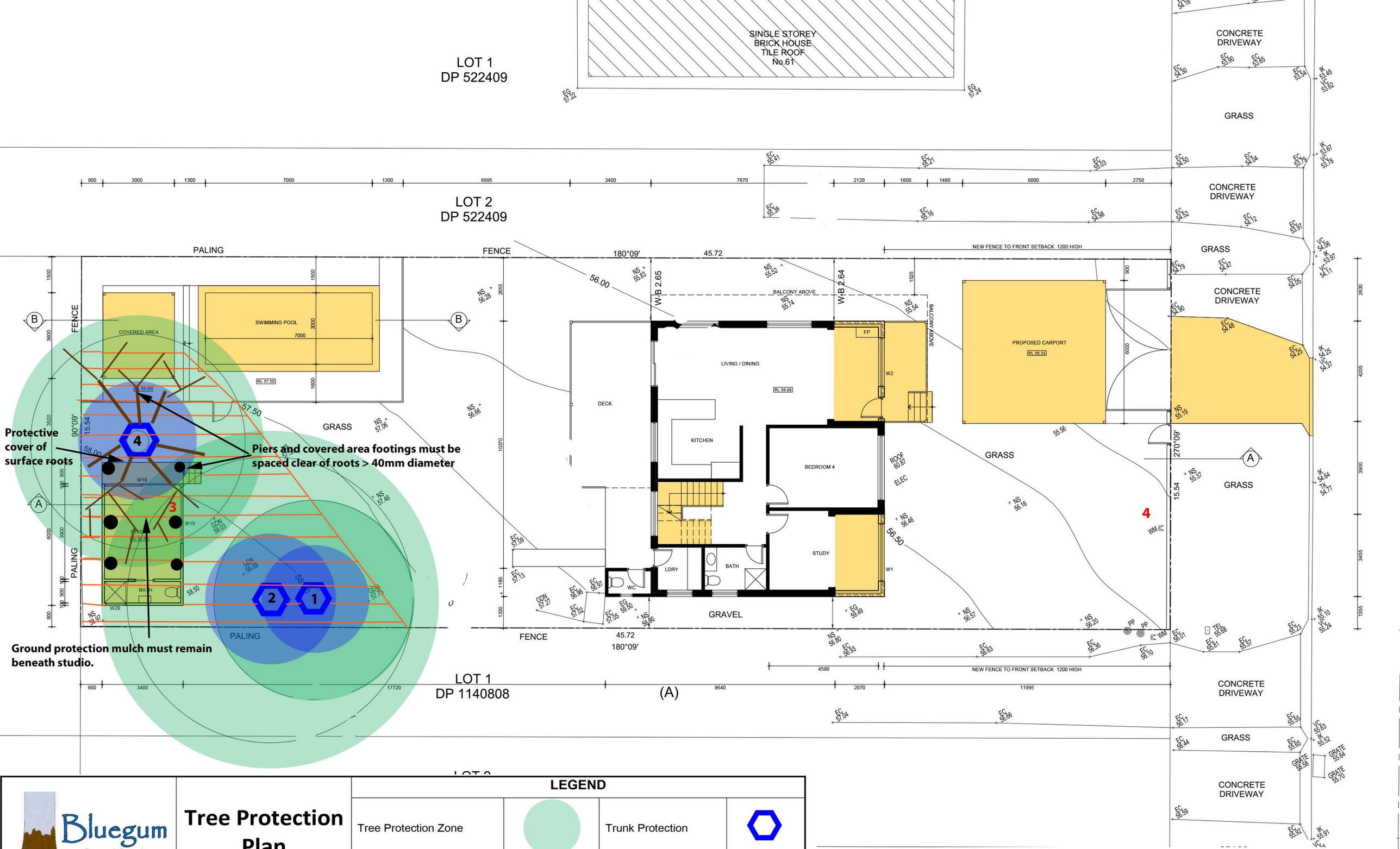
HIGH Retention Value: These trees are worthy of retention and major design consideration should be made where feasible to allow this.

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.

.



Bluegum Tree Care and Consultancy®	**Tree Protection Plan**	**LEGEND**
Alexis Anderson - 0431 286 080 info@bluegumarborist.com.au AQF Level 5 -Consulting Arborist	**57 Lantana Avenue, Wheeler Heights**	Tree Protection Zone / Trunk Protection Structural Root Zone / Ground Protection

-This plan must be read in conjunction with the Arboricultural Impact Assessment report dated November 2022.

-This Tree Protection Plan was prepared with the Proposed Ground Floor Plan, September 2022, Corona Projects as a base.

-Tree protection requirements should be reviewed and finalised following the start-up meeting between the Project Arborist and Site Foreman.