Arboricultural Impact Assessment Report

25 Marlborough Avenue Freshwater

Version 1

Prepared For:

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1. Background

1.1. Introduction

Daniel Leonard (Author) was commissioned by Yun Zeng (Client) through Aura Tree Services to provide Arboricultural advice on the potential impact the proposed development will have on existing trees at 25 Marlborough Avenue Freshwater (the site).

The Client requested the Author compile an Arboricultural Impact Assessment (AIA) on their behalf on the 5th August 2025. This assessment will include:

- The identification of all trees that have the potential to be impacted by the building proposal,
- A ground based Visual Tree Assessment (VTA) of all trees potentially affected by the building proposal,
- A retention rating for all trees potentially affected by the building proposal,
- Any encroachments to the existing trees and their ability to be retained,
- Any recommendations for pruning or removal, and a
- Tree Protection Plan (TPP) for trees to be retained.

1.2. Purpose of this report

This report provides an analysis of the impact the proposed development may have on existing trees on the site and will provide specifications for the effective management of the existing trees including tree protection measures and supervision of works.

The primary purpose of the report is to:

- identify which trees can be retained under the building proposal,
- provide evidence to Council that those trees will remain viable and be protected prior to, during and after construction.

1.3. The Proposal

The site is a suburban block of a large size and unusual configuration for the area, with a long narrow driveway opening up into a terraced block. it is not listed on the State heritage register. There is an existing 2 story brick residence on the property (see attached survey plans).

There are a total of 9 existing prescribed trees on or near the site.

The proposal is to make additions and alterations to the current property including the extension of the current building.

1.4. Subject Trees

There are a total of 9 trees on the site.

Tree locations associated with the numbers above can be found in *Figure 3*. These trees will be the focus of this report.

There are several shrubs and small trees that do not meet the definition of a prescribed tree in Mosman Council's DCP including a neighbor's hedge along the western boundary. These trees have not been included in this report.

Specific details such as observations, species, and measurements on each tree can be found in Section 3.4 Assessment Results.

1.5. Documents Referenced

- (IACA) Significance of a Tree Assessment Rating System (STARS),
- AS4970 - 2009 Protection of trees on development Sites,
- Heritage.nsw.gov.au,
- Site analysis and Survey plan provided by the Client.
- Norhtern Beaches Council - Guidelines for trees and development.
- BOM.gov.au

2. Method

2.1. Assessment Method

The subject trees were assessed in accordance with a stage one limited visual tree assessment as formulated by *Mattheck & Breloer (1994),* and practices consistent with modern arboriculture.

This method is subject to the following limitations:

- Tree heights and canopy widths were estimated unless stated otherwise,
- Tree identification was based on the broad taxonomical features present, available, and visible from the ground at the time of the assessment unless stated otherwise,
- A complete visual assessment was not undertaken on trees that were not easily accessible or located in restricted areas,
- The subject trees were assessed from ground level without the use of any invasive diagnostic tools. The following non-invasive tools may have been used; binoculars, probe, sounding hammer, diameter tape, electronic data collection device.

2.2. Retention Value

The retention value of a tree or group of trees is determined using a combination of environmental, cultural physiological and social values.

- **Low:** These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- **Medium:** These trees are moderately important for retention. Their removal should only be considered if they are adversely affecting the proposed building/ works and all other alternatives have been considered and exhausted.
- **High:** These trees are considered important for retention and should be retained and protected. Design modification or relocation of buildings should be considered to accommodate the setbacks as prescribed by the Australian standard *AS4970 Protection of trees on development sites.*

This tree retention assessment has been undertaken in accordance with the Institute of Australian Consulting Arboriculturists (IACA) Significance of a Tree Assessment Rating System (STARS). The System uses a scale of High, Medium, and Low significance in the landscape. Once the landscape significance of a tree has been defined, the retention value can be determined. Each tree must meet a minimum of three assessment criteria in order to be classified within a category. Further details and the assessment criteria can be found in Appendix 3.

2.3. Tree Protection Zones

The most important consideration for the successful retention of trees is to ensure appropriate crown and root area of the trees remain unaffected during construction/works thus allowing them to continue to grow. This requires the allocation of Tree Protection Zones (TPZ) for all trees to be retained within the construction footprint.

As detailed in the Australian Standard for Protection of Trees on Development Sites (AS4970 – 2009), a TPZ. defines an area in which construction activity is either avoided, or as a minimum controlled, in order to successfully retain the tree/s.

The Structural Root Zone (SRZ) represents the minimum area required to maintain tree stability without consideration to the ongoing health of the tree. Severing roots within the SRZ that are >50mm is not recommended as it may lead to the decline or structural failure of the tree/s

All TPZ measurements are provided in the tree assessment data in *table 2.*

Figure 1: TPZ and SRZ cross section

2.4. Encroachment Assessment

Encroachment into the TPZ is generally broken into the three categories listed below:

- **No Encroachment:** No likely foreseeable encroachment within the TPZ,
- **Minor Encroachment (<10%):** If the proposed encroachment within the TPZ is less than 10% and there is no encroachment into the SRZ then detailed root investigations should not be required. The area that has been encroached upon should be compensated for elsewhere and be contiguous with the TPZ,
- **Major Encroachment (>10%):** The project arborist must be able to demonstrate that the subject tree/s remain viable if the encroachment is greater than 10%. The area that has been encroached upon should be compensated for elsewhere and be contiguous with the TPZ,

Figure 2: Encroachment zones

2.5. Mitigation Measures

Any encroachment within a TPZ must be compensated for to ensure the impacts of the encroachment are mitigated. The amount of compensation required increases as the level of encroachment increases.

The following table outlines the levels of encroachment and the corresponding mitigation measures that are required.

Encroachment	Mitigation Measures
No Encroachment (0%)	No mitigation measures required
Minor Encroachment (<10%)	A detailed noninvasive root investigation should not be required under most circumstances, The area that has been lost must be compensated for elsewhere, contiguous with the TPZ, and Any roots that are cut must be done so with a sharp saw to ensure a clean cut.
Major Encroachment (>10%)	A detailed noninvasive root investigation should be carried out using approved methods such as an air spade, Vacuum Excavator, or hand digging. The Project Arborist must be onsite to determine which roots may be severed, The area that has been lost must be compensated for elsewhere, contiguous with the TPZ, The project arborist must be able to demonstrate the tree/s would remain viable, and consideration should be given to, size, age, species, root diameter, location and species.

Table 1: encroachment

2.6. Tree Protection Plan

A detailed site-specific Tree Protection Plan (TPP) is to be prepared by an AQF Level 5 Arboricultural Consultant and submitted for approval to the nominated certifier prior to issue of the Construction Certificate. The TPP is to be prepared in accordance with the principles and specifications identified in AS4970 - 2009 Protection of trees on development sites and is to include, but not be limited to the following:

- A site plan showing locations of proposed tree protection fencing, trunk and ground protection within the identified Tree Protection Zones (TPZ) of trees identified for retention,
- Tree Protection fences and other protection methods such as trunk protection,
- Specifications for any proposed pruning to above ground parts of the tree,
- Tree root protection specifications for excavations or soil fill within the TPZ,
- Hold points and site compliance reporting schedules if applicable, and
- Ground protection for vehicular access to limit compaction if required.

The Tree Protection Plan can be found in the appendix of this report.

3. Results

The results were calculated by overlaying the TPZ radius onto the survey plans provided. The results can be found in *Table 2*.

Any discrepancies to the Survey Plans may result in inaccuracies in the TPZ encroachment calculation.

Trees 1, 2, 3 and 9 will have no encroachment into their TPZs.

3.1. Minor Encroachment (<10%)

The following trees have minor encroachment:

- Trees 5, 6, 7 and 8 will have a minor encroachment of between 2-10% into their TPZs due to the proposed development. This encroachment is considered to have a minimum impact to these trees.

3.2. Major Encroachment (>10%)

The following trees have major encroachment:

- No trees have a major encroachment.

3.3. Trees unable or unworthy of retention

The following trees are unworthy or unable to be retained:

- Trees 5 and 6 have a useful life expectancy of less than 5 years as they are in the early stages of decline or are outgoing their environment. Removal and replacement of these trees would be considered good arboricultural practice.
- Tree 9 is classified as an exempt species under Mosman Council's Development Control Plan (DCP) and may therefore be removed without the need for Council approval. Its removal is recommended as part of good arboricultural practice.

Of the **9** trees on the site, **0** will need to be removed if the proposed development is to proceed, with **3** trees recommended for removal for arboricultural reasons.

3.4. Assessment Results

Project Name:	Arboricultural Impact Assessment - 25 Malborough Avenue Freshwater															
	Results															
Survey Number	Number of trees	Genus	Species	Common Name	Height (M)	Canopy Spread (M)	Age Class	DBH (CM)	Health	Structural condition	Defects	Significance	Useful Life Expactancy	Retention Priority	TPZ Radius (M)	SRZ Radius (M)	Encroachment (%)	Comments
T1	1	Archontophoenix	cunninghamii	Bangalow Palm	17	6	Mature	28	Good	Good		Medium	Medium 15-40Y	Consider for retention	3.4	1.9	0.0%	
T2	1	Archontophoenix	cunninghamii	Bangalow Palm	17	6	Mature	28	Good	Good		Medium	Medium 15-40Y	Consider for retention	3.4	1.9	0.0%	
T3	1	Archontophoenix	cunninghamii	Bangalow Palm	17	6	Mature	28	Good	Good		Medium	Medium 15-40Y	Consider for retention	3.4	1.9	0.0%	
T4	1	Lophostemon	confertus	Brush Box	15	11	Mature	48	Fair	Fair		Medium	Medium 15-40Y	Consider for retention	5.8	2.4	0.0%	
T5	1	Glochidion	ferdinandi	Cheese Tree	15	11	Mature	57	Poor	Poor	The tree is in early stages of decline	Medium	Remove 0-5Y	Consider for removal	6.8	2.6	7.8%	Consider removal and replacement
T6	1	Eucalyptus	robusta	Swamp Mahogany	16	12	Mature	50	Fair	Poor	trunk is growing over the sandstone wall	Medium	Remove 0-5Y	Consider for removal	6.0	2.5	9.3%	Consider removal and replacement
T7	1	Syzygium	luehmannii	Lilly Pilly	15	12	Mature	45	Fair	Fair		Medium	Short 5-15Y	Consider for removal	5.4	2.4	2.2%	
T8	1	Syzygium	luehmannii	Lilly Pilly	15	12	Mature	45	Poor	Fair	The tree is in early stages of decline	Medium	Short 5-15Y	Consider for removal	5.4	2.4	1.8%	Neighbours tree
T9	1	Ligustrum	lucidum	Broad Leaved Privet	4	5	Semi Mature	8	Fair	Fair	This species is a priority weed	Low	Remove 0-5Y	Consider for removal	2.0	1.5	0.0%	Neighbours tree

Table 2 Results from site survey

4. Specifications

The following specifications are required if the proposed development is to proceed:

A detailed site-specific Tree Protection Plan (TPP) is to be prepared by an AQF Level 5 Arboricultural Consultant along with an AIA and submitted to the nominated certifier for approval (*See Appendix 2 for TPP*).

- All tree pruning and removals must be undertaken by an Arborist holding a minimum certificate 3 in Arboriculture and associated insurances.
- Any underground pipes or cabling is to be routed outside the TPZs if possible. The Project Arborist must be informed prior to any further unplanned encroachment within the TPZs.
- The area within the tree protection fencing should be mulched with good quality leaf mulch to a depth of 100mm prior to construction to promote better tree health during the construction period.
- Ensuring that the soil moisture content stays above 50% within the TPZs will greatly benefit the trees to be retained on the site and will help offset the impacts of construction.

4.1. Tree removals

The following trees will need to be removed if the proposed development is to proceed:

- Trees 5 and 6 have a useful life expectancy of less than 5 years as they are in the early stages of decline or are outgoing their environment. Removal and replacement of these trees would be considered good arboricultural practice.
- Tree 9 is classified as an exempt species under Mosman Council's Development Control Plan (DCP) and may therefore be removed without the need for Council approval. Its removal is recommended as part of good Arboricultural practice.

Of the **9** trees on the site, **0** will need to be removed if the proposed development is to proceed, with **3** trees recommended for removal for arboricultural reasons.

Appendix 1 – Tree locations

Below is an image of the tree locations showing the TPZ and encroachments.

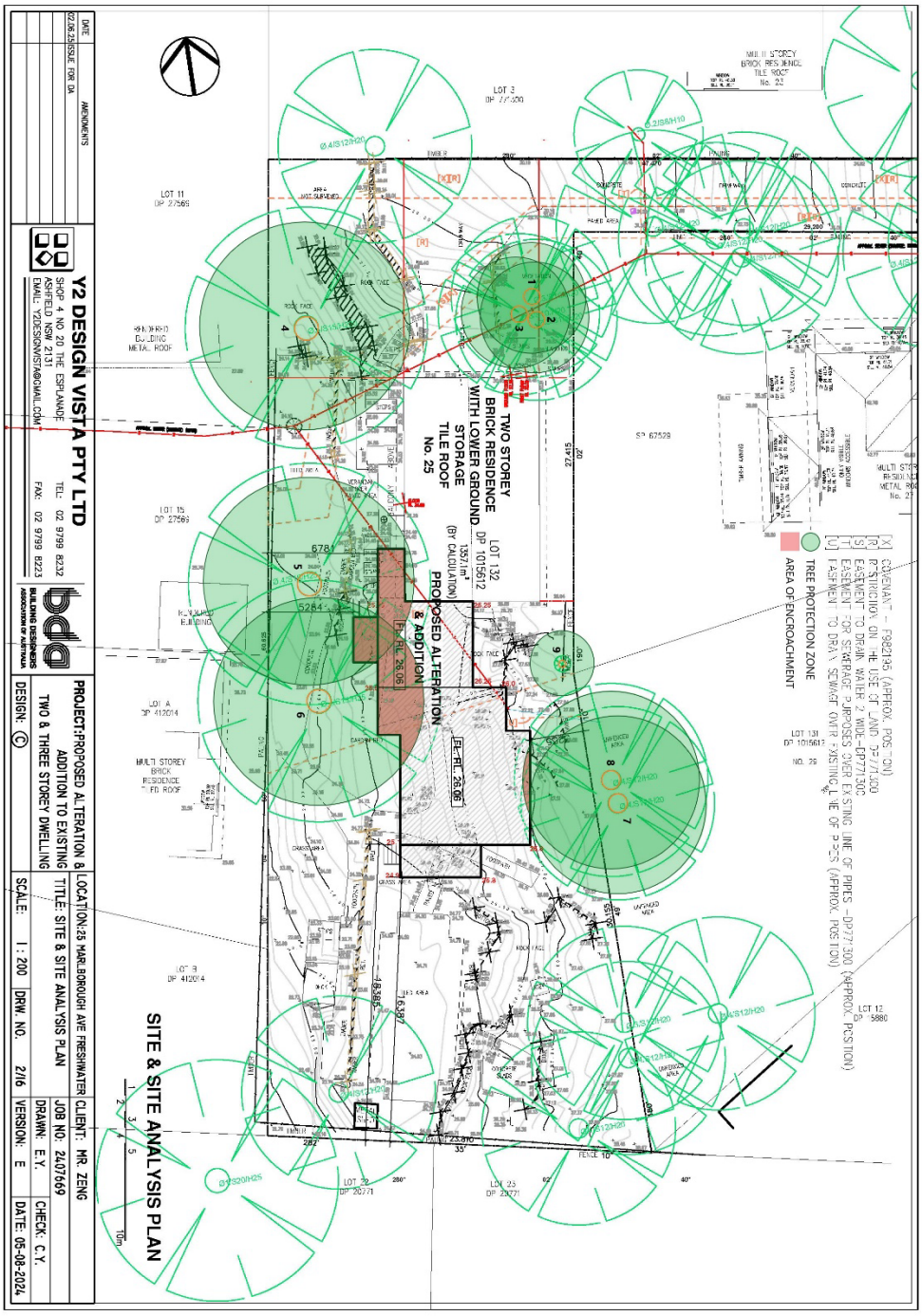

Figure 3: Tree locations

Appendix 2 – Tree Protection Plan

Specifications

The following specifications are required if the proposed development is to proceed:

- Any changes to the grade of the soil within the TPZ of trees to be retained due to landscaping works must be approved by the Project arborist.
- All tree pruning and removals must be undertaken by an Arborist holding a minimum certificate 3 in Arboriculture and associated insurances.
- Any underground pipes or cabling is to be routed outside the TPZs if possible. The Project Arborist must be informed prior to any further unplanned encroachment within the TPZs.
- The area within the tree protection fencing should be mulched with good quality leaf mulch to a depth of 100mm prior to construction to promote better tree health during the construction period.
- Ensuring that the soil moisture content stays above 50% within the TPZs will greatly benefit the trees to be retained on the site and will help offset the impacts of construction.

Tree Protection Fencing

Tree protection fencing must be established in the locations shown in *Figure 4*. Existing fencing, site hoarding or structures (such as a wall or building) may be used as tree protection fencing, providing the TPZ remains isolated from construction footprint.

Tree protection fencing must be installed prior to site establishment and remain intact until completion of works. Once erected, protective fencing must not be removed or altered without the approval of the project arborist.

Tree protection fencing shall be:

- Enclosed to the full extent of the TPZ (or as specified in the Specifications and Tree Protection Plan).
- Temporary mesh panel fencing (minimum height 1.8m).
- Certified and inspected by the project arborist.
- Installed prior to the commencement of works.
- Prominently signposted with 300mm x 450mm boards stating, “NO ACCESS - TREE PROTECTION ZONE”.

If tree protection fencing cannot be installed due to sloping or uneven ground, tree protection barriers must be installed as an alternative.

Specifications for tree protection barriers are as follows:

- Star pickets spaced at 2m intervals,
- Connected by a continuous high-visibility barrier/hazard mesh.
- Maintained at a minimum height of 1m.

Where approved works are required within the TPZ, fencing may be setback to provide construction access. Trunk, branch and ground protection shall be installed and must comply with AS 4970-2009, Protection of Trees on Development Sites. Any additional construction activities within the TPZ of the subject trees must be assessed and approved by the Project Arborist.

TPZ Fencing Plan

Below is an image of the Fencing plan.

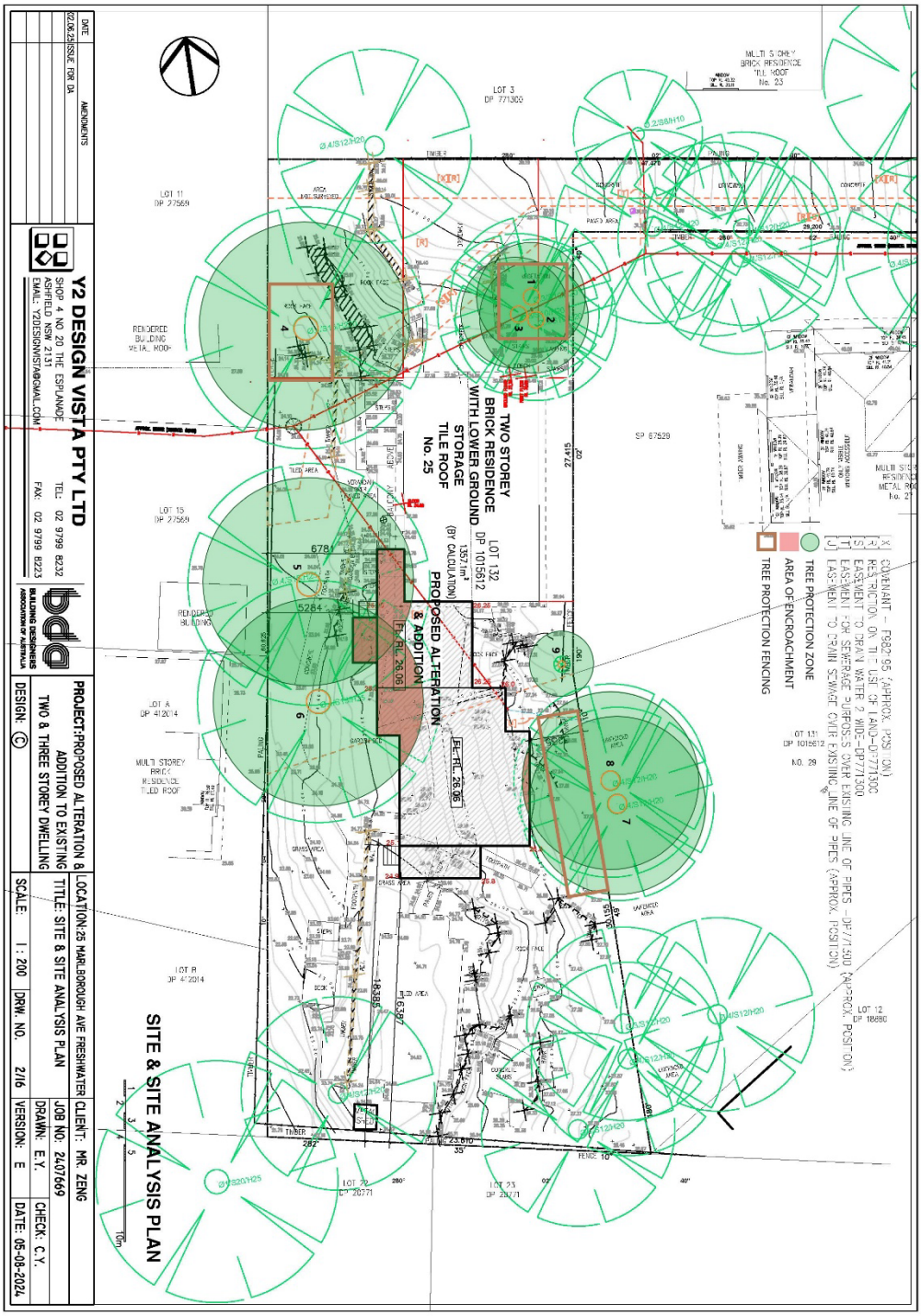

Figure 4: Fencing Plan - Fence in brown

Trunk protection

Where the provision of tree protection fencing is impractical or must be temporarily removed, trunk protection shall be installed to avoid accidental mechanical damage.

Specifications for trunk protection are as follows:

- A thick layer of carpet underfelt, geotextile fabric or similar wrapped around the trunk to a minimum height of 2m.
- 1.8m lengths of softwood timbers aligned vertically and spaced evenly around the trunk (with a small gap of approximately 50mm between the timbers).
- The timbers must be secured using galvanized hoop strap.

The timbers shall be wrapped around the trunk but not fixed to the tree, as this will cause injury/damage to the tree.

Ground protection

If temporary access for vehicles, plant or machinery is required within the TPZ, ground protection shall be installed. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Where possible, areas of existing pavement shall be used as ground protection.

Specifications for light traffic access (<3.5 tonne) are as follows:

- Permeable membrane such as geotextile fabric.
- Layer of mulch or crushed rock (at minimum depth of 100mm)

Specifications for heavy traffic access (>3.5 tonne) are as follows:

- Permeable membrane such as geotextile fabric.
- Layer of lightly compacted road base (at minimum depth of 200mm)
- Geotextile fabric shall extend a minimum of 300mm beyond the edge of the road base.

Pedestrian, vehicular and machinery access within the TPZ shall be restricted solely to areas where ground protection has been installed.

Excavations

All approved excavations (including root investigations) within the TPZ must be carried out using tree sensitive methods under supervision of the Project Arborist. These methods may include:

- Manual excavation (hand tools).
- Air spade.
- Hydro-vacuum excavations (sucker-truck).

Where approved by the Project Arborist, excavations using compact machinery fitted with a flat bladed bucket is permissible. Excavations using compact machinery shall be undertaking in small increments and guided by the Project Arborist who is to look for and prevent root damage to roots >50mm in diameter.

No over-excavation, battering or benching shall be undertaken beyond the footprint of any structure unless approved by the Project Arborist. Hand excavation and root mapping shall be undertaken along excavation lines within the TPZ prior to the commencement of mechanical excavation (to prevent tearing and shattering of roots from excavation equipment). Any conflicting roots (>50mm in diameter) shall be pruned using clean, sharp secateurs or a pruning saw to ensure a clean cut free from tears. All root pruning must be documented and carried out by the project arborist.

Underground services

All underground services should be routed outside of the TPZ. If underground services need to be installed within the TPZ, they must be installed using tree sensitive excavation methods under supervision of the Project Arborist.

Alternatively, boring methods such as horizontal directional drilling (HDD) may be used for underground service installation, providing the installation is at minimum depth of 800mm below grade. Excavations for entry/exit pits must be located outside the TPZ.

Site Inspections

In accordance with the Australian Standard, *AS 4970-2009, Protection of Trees on Development Sites*, inspections must be conducted by the Project Arborist at the following key project stages:

- Prior to any work commencing on-site (including demolition, earthworks or site clearing) and following installation of tree protection.
- During any excavations, building works and any other activities carried out within the TPZ of any tree to be retained & protected.
- Following completion of the building works.

It shall be the responsibility of the Project Manager to notify the Project Arborist prior to any works within the TPZ, of any protected tree at a minimum of 48 hours' notice. To ensure the Tree Protection Plan is implemented, hold points have been specified in the schedule of work *(Table 4).*

Schedule of Work

Hold Point	Instruction
Pre - Construction Works	Tree protection (for trees that will be retained) shall be installed prior to demolition and site establishment, this may include mulching of areas within the TPZ. Project Arborist shall inspect and certify tree protection.
During Construction works	Project Arborist to supervise and document all works carried out within the TPZ of trees to be retained.
Post Construction Works	Inspection of trees by Project Arborist after all major construction has ceased, following the removal of tree protection measures.

Table 3: Hold points

Appendix 3 – STARS Retention Rating Method

Useful Life Expectancy	Tree Significance: High	Medium	Low		
Long >40 years					
Medium 15-40 years					
Short <1-15 years					
Dead					

Legend for Matrix Assessment	
	Priority for retention (High): These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented if works are to proceed within the Tree Protection Zone.
	Consider for retention (Medium): These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with the removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.
	Consider for removal (Low): These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	Consider for removal (Low): These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

Reference

IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS)
Institute of Australian Consulting Arboriculturists
Australia, www.iaca.org.au

Appendix 4 – Photos of the trees

Figure 5: Trees 1-3

Figure 6: Tree 4

Figure 7: Tree 5

Figure 8: Tree 6

Figure 9: Base of tree 6