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Arborist Impact Assessment

Proposed Development

Lot 180 DP752017

40 Myoora Road, Terrey Hills, NSW

Prepared for: H & E Architects

April 2025

AEP Ref: 3550

Revision: 03

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Document Control

Document Name	Arborist Impact Assessment for Proposed Development at 40 Myoora Road, Terrey Hills, NSW.
Project Number	3550
Client Name	H & E Architects
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Revision

Revision	Date	Author	Reviewed	Approved
00	26/07/2024	Thomas Stephens	Warwick Muir	Warwick Muir
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03	11/04/2025	Angie Guevara	Warwick Muir	Warwick Muir

Distribution

Revision	Date	Name	Organisation
00	26/07/2024	Megan Naylor	H & E Architects
01	10/09/2024	Megan Naylor	H & E Architects
02	24/09/2024	Megan Naylor	H & E Architects
03	11/04/2025	Megan Naylor	H & E Architects

Disclaimer

Direct observations are relevant only to the trees identified within this report. This report utilizes a rapid assessment of tree health and condition to inform retention value. This assessment of tree health and condition is based on non-destructive visual observations from ground level. Thus, it is not possible to identify all structural faults at high levels in the tree, internal structural faults or within the root system. Observations about Tree Health, Structure, and other characteristics have been made at the time of assessment and these characteristics may change over time due to natural growth of the tree as a living organism or due to unforeseen events. As such the observations that are supplied within are relevant for a period of 12 months from the time of assessment, after which re-assessment may be required for the trees assessed within this report. The recommendations and methodologies for Tree Protection within this report are relevant only to the Trees assessed within this report. The author is not responsible for tree damage related to failure to apply these recommendations or methodologies for Tree Protection in full within this report or for tree damage relating to works conducted by an unaffiliated person. No responsibility for damage to persons or property is accepted for damage by trees referred to within this report.

Executive Summary

At the request of the Isaac Property Developments Pty Ltd (the client), Anderson Environment & Planning (AEP) have prepared an Arborist Impact Assessment and Tree Protection Plan to address the potential arboricultural impacts from the proposed commercial development and associated civil infrastructure (the Proposal) at 40 Myoora Road, Terrey Hills NSW. (the Subject Site).

The arborist site survey was undertaken on 3 April and 17 July 2024. Tree Assessment was undertaken by the following methodologies (**Section 4**);

- A visual tree assessment as described by Mattheck and Breloer (1994).
- Characteristic features for each tree were recorded;
- Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) using methods of calculation as outlined in AS 4970 – 2009.
- Landscape Significance Rating (LSR) and Retention Values as outlined by Morton (2006).

A total of 24 trees identified within the site and surrounds were assessed. The condition of the assessed trees includes three (3) in poor or dead condition, seven (7) in fair condition and 14 in good condition (**Section 5.1**).

The following landscape significance ratings (LSRs) have been applied to the assessed trees (**Section 5.2**);

- 13 'High', due to their canopy size and good health and as representatives of the original vegetation of the area; and
- Nine (9) 'Moderate' due to their canopy size and higher visibility as exotic or native cultivar status; and
- Two (2) 'Low' as exotic shrub species of low visibility or amenity value.

With consideration of the estimated life expectancy for each tree, Retention Values were assigned to each tree within the site. This identified the following;

- 15 'High',
- Seven (7) 'Moderate'; and
- Two (2) 'Low' Retention Value Trees.

A total of 29 assessed trees are proposed for removal due to the development works. This includes 11 individual trees and one (1) stand comprising 18 trees. (**Section 6.1, Table 3**), including;

- Nine (9) trees located within the development footprint; and
- Two (2) trees which will have encroachment into the SRZ by the development footprint.
- Stand 1 (18 Trees).

A total of 13 assessed trees can be retained outside of the site, with seven (7) requiring Tree Protection Measures including tree protection fencing.

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1.0 Introduction

1.1 Background

At the request of the Isaac Property Developments Pty Ltd (the client), Anderson Environment & Planning (AEP) have prepared an Arborist Impact Assessment and Tree Protection Plan to address the potential arboricultural impacts from the proposed commercial development and associated civil infrastructure (the Proposal) at 40 Myoora Road, Terrey Hills NSW. (the Subject Site).

This report considers the Ecological Assessment Report (EAR) undertaken for this development (AEP 2024).

1.2 Objectives

Further to the above the following objectives for this report have been assigned:

- Tree identification plan and schedule identifying tree species, size, canopy spread and other dimensions**;**
- Assessment of all trees within the Subject Site, including, but not limited to, the health and vigour of the trees, structural integrity, life expectancy, retention value and landscape significance;
- Likely impact the proposed development will have on assessed trees, including TPZ and SRZ encroachments; and
- Tree protection plan and methodologies throughout the development for all impacted trees to be retained.

2.0 Site Description and Locality

Table 1 provide the site details for the Subject Site.

Table 1: Site Particulars

Detail	Comments
Client	Isaac Property Developments Pty Ltd
Address	40 Myoora Road, Terrey Hills, NSW. 2084
Title(s)	Lot 180 DP752017
Subject Site	The Subject Site consists of lands within Lot 180 DP752017 and totals approx. 1.58ha.
LGA	Northern Beaches Council
Zoning	Warringah Local Environmental Plan 2011 (The LEP) The Subject Site is zoned RU4 – Primary Production Small Lots.

Detail	Comments
Current Land Use	The Subject Site is in a highly disturbed condition with the majority of the site being previously cleared, and utilised for domestic landscaping, small-scale horticulture and livestock rearing. The south-eastern half of the site comprised three built structures: a single storey brick built residential building with concrete tiled roof, small concrete hard standing footpaths and a bitumen driveway. In addition, a small livestock paddock housing goats and foul was also present, as well as a polytunnel and numerous bee hives. The central portion of the site extending towards the north-west comprised recently mown grassland dominated by non-native species. The north-western portion of the site comprised a large area of bare and disturbed ground, utilised for storage of a number of vehicles, machinery and materials as well as a single shipping container.
Surrounding Land Use	The lot is bounded to the south by Mona Vale Road and Myoora Road to the north. The surrounding lots are a mixture of commercial, industrial and residential development. The study area is surrounded by a mixture of managed and unmanaged grassland vegetation and remnant forest vegetation.
Soil	The Subject Site occurs on undulating to rolling rises and low hills on Hawkesbury Sandstone. Soils are described as loose, coarse sandy loam within the topsoil (eSpade, 2024).

3.0 Proposed Development

The proposal is for a commercial development comprising of a mixed-use hospitality venue with supporting car parking servicing and extensive landscaping throughout the whole site.

Figure 1 depicts the extent of the Subject Site overlain on an aerial photograph of the locality.

Figure 2 shows a concept plan for the proposed development.

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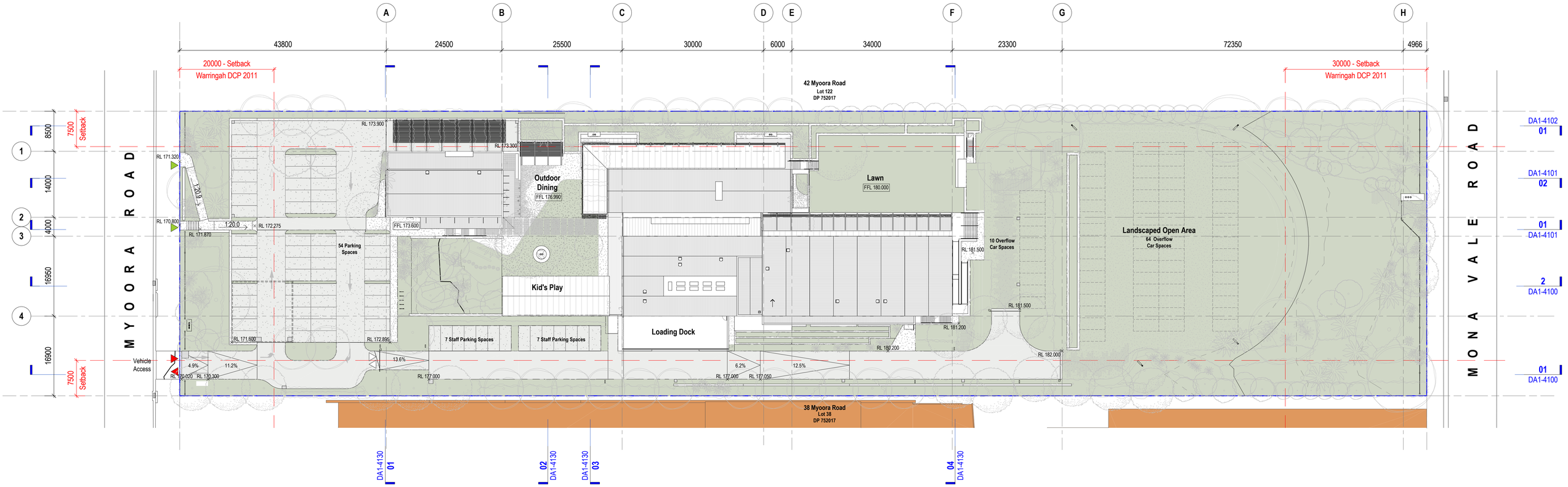
Figure 1 - Site Location

Location: 40 Myoora Road, Terrey Hills NSW 2084

Client: H & E Architects

Date: April 2025

AEP ref: 3550



DA Legend

UNO the general extent and location of alterations or additions, including demolition is indicated accordingly:

- Proposed new building fabric
- Area of proposed demolition
- Neighbouring Light Industrial Buildings
- Neighbouring Residential Buildings
- Subject to final layout this area is to comply with Australian Standard 4674-2004; Design, construction and fit out of food premises. Refer to DA1-1200.

For Development Approval

General Notes

Rev	Date	Amendments
01	28.09.23	Preliminary Issue for Information
02	16.10.23	Issue for Information
03	27.10.23	Issue for Information
04	31.10.23	Issue for Information
05	19.03.24	Consultant Issue
06	02.04.24	Issue for Information: Pre-DA Meeting
07	03.05.24	Issued for Landscape Coordination
08	21.05.24	Issue for Information: Design and Sustainability Advisory Panel

Rev	Date	Amendments
09	26.07.24	Issue for Information
10	14.08.24	Issue for Information
11	03.09.24	For Development Approval

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Nominated Architect: Glenn Cunnington #6415

Project
40 Myoora Road

Client
Gardoxi P/L (Norwest)

Location
40 Myoora Road, Terrey Hills NSW 2084

Drawing
Site Plan - Proposed

Scale @ A1	1:400	Drawn by	Checked by
Scale @ A3	1:800		
Project Start Date	Issue Date	Sheet Issue Date	03/09/24
Project #	2725		
Drawing #	DA1-0500	Rev	11

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4.0 Methodology

The arborist site survey was undertaken on 3 April and 17 July 2024. Each tree observed within the Subject Site was assigned a unique tree number. Tree species were identified based on guidance from regional identification guides (Fairley and Moore 1989, Robinson 2003), and descriptions and records provided by the Royal Botanic Gardens (Plantnet 2022).

4.1 Visual Tree Assessment

A visual tree assessment to evaluate the health and condition of these trees in relation to the impacts of the proposed development was undertaken from ground level following the methodology described by Mattheck and Breloer (1994). Tree height was estimated following the guidance outlined in the Private Native Forestry Code of Practice (DECC 2007) and confirmed with a laser range finder. The Diameter at Breast Height (DBH) and Diameter Above Buttress (DAB) was determined using a DBH tape and methods of calculation for the Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) applied as outlined in Australian Standard 4970-2009 *Protection of trees on development Sites* (AS 4970 – 2009) (Standards Australia 2009). Tree Total Canopy Area was estimated from the formula Pi x (average canopy spread)^2.

4.2 Tree Retention Value

To determine tree Retention Value a Landscape Significance Rating (LSR) was assigned to each tree. The LSR value provides consideration of the tree's amenity, environmental and heritage values (refer **Appendix B**). Trees are then assigned one of the following LSR categories:

- Significant (1);
- Very High (2);
- High (3);
- Moderate (4);
- Low (5);
- Very Low (6); and
- Insignificant (7).

Once the landscape significance value has been determined the following assessment matrix that utilises estimated life expectancy and landscape significance (**Table 2**) was applied to each tree.

Table 2: Tree Retention Status Matrix Assessment matrix adopted from Morton (2006).

Landscape significance rating							
Estimated Life Expectancy	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Greater than 40 Years	High						
15 to 40 Years			Moderate				
5 to 15 Years				Low			
Less than 5 Years					Very low		
Dead or Hazardous							

4.3 Limitations

This report utilises a rapid assessment of tree health and condition to inform retention value. Should a detailed assessment of tree structural health and condition be required a tree risk assessment report should be commissioned.

This assessment of tree health and condition is based on non-destructive visual observations from ground level. Thus, it is not possible to identify all structural faults at high levels in the tree, internal structural faults or within the root system. Should a detailed assessment for structural faults be required a tree risk assessment report should be commissioned.

Weather conditions such as extreme wind, storm activity, lightning as well as other events or disturbances independent of the proposed activities are unpredictable. Unforeseeable damage to trees may occur as a result of unpredictable or unplanned weather events or disturbances.

Tree identifications are based on identifying features (fruit, inflorescence, etc.) found during April and July and made at ground level from within the Subject Site.

The total canopy area for each tree utilised within this report is an estimation based on field observation of canopy spread and the true amount of canopy area may differ.

Tree identified within by this plan are located to GPS accuracy and there may be some minor discrepancy in the true location.

Impact assessment was based to limited concept design confined to identification of the approximate proposal footprint at the time of preparation of this report. Variation of this concept design will alter some of the recommendations and this report should be updated to reflect these changes.

5.0 Tree Assessment Results

A total of 24 trees identified within the site and neighbouring properties were assessed. Observations were made for each assessed tree **(Appendix A).** Tree locations are shown in **Figure 3** and **Figure 4.**

5.1 Summary of Tree Condition and Characteristics

Of the 24 trees assessed, 11 of these trees are located within the Subject Site. The additional 13 trees are located within the adjacent properties with Tree Protection Zones within the footprint.

All trees assessed within the site are native species. The condition of the assessed trees includes three (3) in poor or dead condition, seven (7) in fair condition and 14 in good condition.

A stand is a group of trees of the same species, similar age and characteristics within close proximity that have been grouped together for the purposes of assessment. The following stands have been assessed;

- Stand 1 has approximately 18 *Cupressus sp.* individuals that have an average DBH of 0.31m in overall Fair condition.

Notable Trees within this grouping that are in poor or dead Structural and Health Condition including the following:

- Tree 15 – *Ceratopetalum gummiferum* (NSW Christmas Bush) has two co-dominate leaders with large cracks and fractures below at the base. A small hollow was also located at the base. The twisted form individual contains multiple dead branches and has the canopy crossing and/or rubbing with other nearby trees;
- Tree 18 – *Eucalyptus cinera* (Argyle Apple) has a twisted form. The overall canopy health of the individual display's poor health; and
- Tree 33 – *Eucalyptus grandis* (Flooded Gum) is an overmature individual with abundant deadwood and an asymmetric crown.

5.2 Summary of Landscape Significance and Retention Value

The following landscape significance ratings (LSRs) have been applied to the assessed trees;

- 13 'High', due to their canopy size and good health and as representatives of the original vegetation of the area; and
- Nine (9) 'Moderate' due to their canopy size and higher visibility as exotic or native cultivar status;
- Two (2) 'Low' as exotic shrub species of low visibility or amenity value; and
- Stand 1 'Moderate' due to their canopy size and higher visibility as exotic status.

With consideration of the estimated life expectancy for each tree, Retention Values were assigned to each tree within the site. This identified the following;

- 15 'High',
- Seven (7) 'Moderate';
- Two (2) 'Low'; and
- Stand 1 'Moderate' Retention Value Trees.

Small hollows were located in Tree 15. A hollow bearing tree (HBT) survey has been completed as part of the EAR for this site.

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Figure 3 - Tree Location (West)

Date: April 2025

Location: 40 Myoora Road, Terrey Hills, NSW

Client: H & E Architects

AEP ref: 3550

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Figure 4 - Tree Location (East)

Date: April 2025

Location: 40 Myoora Road, Terrey Hills, NSW

Client: H & E Architects

AEP ref: 3550

6.0 Tree Impact Assessment

The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) are indicative areas critical for maintaining a tree's viability and stability respectively, holding the majority of the roots necessary for each function. Any ground works within these zones is likely to impact the viability or stability of the tree by injuring the root system.

6.1 Proposal Impacts

Upon review of the supplied proposal footprint, nine (9) individual trees and Stand 1, comprising 18 trees, will require removal as they are located within the development footprint. These include:

- Five (5) 'High' (Trees 1, 2, 3, 4, 5);
- Three (3) 'Moderate' (Trees 24, 32, 47);
- One (1) 'Low' (Tree 15); and
- Stand 1, classified with a 'Moderate' Retention Value (18 Trees).

These trees will require removal to facilitate the development. Impacts are unlikely to be mitigated through tree protection measures without major design changes, and tree stability and viability cannot be guaranteed.

Upon review of the supplied proposal footprint, two (2) trees will require removal as these trees will be impacted by predicted structural root zone encroachment. These include:

- Two (2) 'High' Retention Value (Trees 6, 7).

Impacts are unlikely to be mitigated through tree protection measures without major design changes, and tree stability and viability cannot be guaranteed. There is limited to scope to mitigate this impact without further amending the retaining wall to be outside of the structural root zone of this tree.

Impacts upon the local environment by tree removal within this report have already been considered in an Ecological Assessment Report for this site (AEP, 2024).

A further 13 trees can be retained within close proximity to the development footprint. The following relates to tree protection for these trees;

- Tree 8 (located on the western roadside of the property), have predicted minor encroachment (<10%) by the development, however, the TPZ of these trees can be feasibly offset into unimpacted areas and these trees should be retained. If TPZ fencing as displayed in **Figure 7** is impractical for construction works for these trees, ground protection measures such as rumble boards must be installed for the duration of works with the encroached TPZ of Tree 8 as displayed in **Figure 7**; and
- Tree 33, (located north on the adjacent property), has a predicted major encroachment (~22%) by the development, however, the TPZ of this tree can be feasibly offset into unimpacted areas and these trees should be retained. This tree is over-mature and in Poor Health condition with signs of retrenchment, and this encroachment is therefore unlikely to change the Health Condition of this tree. Project Arborist supervision of works within close proximity to the fence line should occur to ensure that tree stability is not impacted by impacts to large roots. If TPZ fencing as displayed in Figure 7 is impractical for construction works for these trees, ground protection measures such as rumble boards must be installed for the duration of works with the encroached TPZ of these trees.
- Trees 11, 12, 18, 33, 35 and 37 (located north on the adjacent property), have predicted minor encroachment (<15%) by the development, however, the TPZ of these trees can be feasibly offset into unimpacted areas and these trees should be retained. If TPZ fencing as displayed

in **Figure 7** is impractical for construction works for these trees, ground protection measures such as rumble boards must be installed for the duration of works with the encroached TPZ of these trees.

- Although Trees 9, 10, 19, 20, 34, and 38 are not predicted to be impacted by the development, they should be retained, and Tree Protection Zone (TPZ) fencing must be installed for the duration of the works, as shown in **Figure 7**. If installing TPZ fencing is impractical due to construction activities, appropriate ground protection measures, such as rumble boards, must be implemented for the duration of the works.

Table 3 provides a summary of impact assessment.

Table 3 Summary of Impact Assessment

Tree Assessment	Retention Value (Tree No)			Total
	High	Moderate	Low	
Remove (SRZ Encroachment)	Tree 6, 7	0	0	**2**
Remove (Development Footprint)	Trees 1, 2, 3, 4, 5	Trees 24, 32, 47. Stand 1 (18 Trees)	Tree 15	**27**
Total Tree Removal	**7**	**21**	**1**	**29**
Retain (No fencing)	Trees 9, 10, 19, 20	Trees 34, 38	0	**6**
Retain (Protection fencing)	Trees 8, 11, 12, 18	Trees 35, 37	Tree 33	**7**
Total Tree Retention	**8**	**4**	**1**	**13**

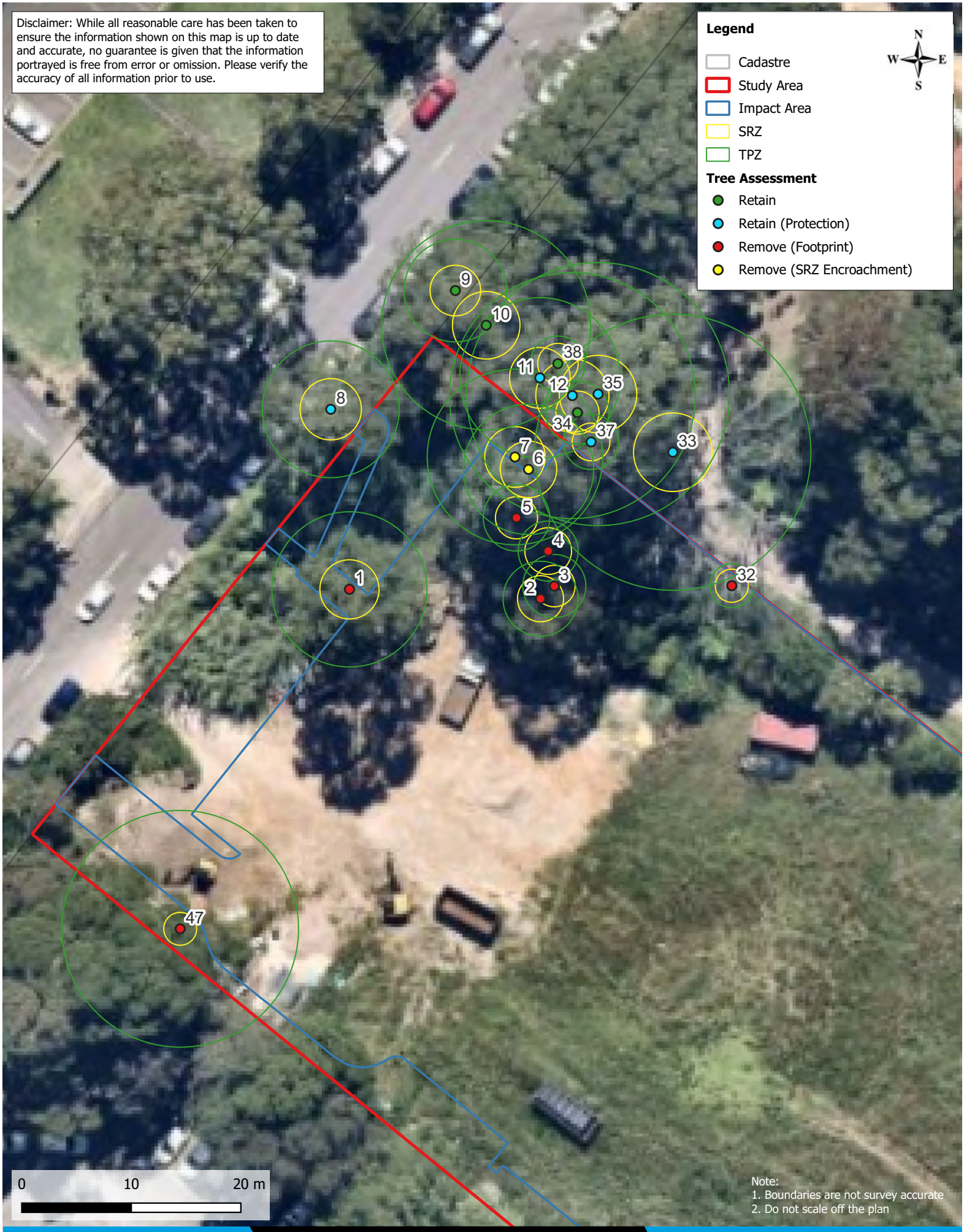

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Figure 5 - Tree Assessment (West)

Date: April 2025

Location: 40 Myoora Road, Terrey Hills, NSW

Client: H & E Architects

AEP ref: 3550

AEP

Figure 6 - Tree Assessment (East)

Date: April 2025

Location: 40 Myoora Road, Terrey Hills, NSW

Client: H & E Architects

AEP ref: 3550

7.0 Recommendations

7.1 Tree Retention and Removal

- Trees designated for removal within this report as outlined in **Section 6** should be removed by a qualified tree worker with appropriate professional liability insurance, and removed in a manner to prevent damage to retained trees.
- Trees designated for retention within this report as outlined in **Section 6** to the development footprint should be retained with Tree Protection Measures.
- It is recommended that a qualified Project Arborist supervise any works conducted near Tree 33, which is to be retained, to ensure that no impacts occur to its structural roots, which could compromise the tree's health and stability.

7.2 Tree Protection Measures

- All tree maintenance and pruning works should be carried out by a qualified tree worker in accordance with AS4373 –2007 Pruning of Amenity Trees.
- A continuous TPZ fence should be installed for retained trees as displayed in **Figure 7.** The TPZ shall be delineated by a 1.8m interlocking chain wire fence located around trees designated to be retained within close proximity to the Works, in accordance with AS 4687. **Appendix D** details tree protection fencing that should be implemented.
- TPZ fencing must be installed before the commencement of any Works. The fencing should not be removed or altered until after the completion of works.
- All Contractors working in close proximity to the TPZ of Trees to be retained should be briefed as to the requirements of the Tree Protection Zone.
- The TPZ fencing and zone should be certified by the project arborist before construction commences.
- Tree health and condition should be monitored by the project arborist at regular stages during construction, at practical completion of construction, and after completion.
- The following activities should be avoided within the TPZ of trees to be retained where practicable:
    - Machine excavation of soil including trenching;
    - Operation of heavy equipment;
    - Stockpiling of soils;
    - Storage of heavy or other equipment;
    - Parking of vehicles;
    - Wash down and cleaning of equipment;
    - Excavation for silt fencing;
    - Dumping of waste;
    - Change of soil level or gradient; and
    - Covering with concrete, impermeable, or compacted surfaces.
- Where works are required that encroach into TPZ of trees to be retained, additional protection measures, which include trunk and low branch guards, and ground protection measures should be implemented following guidance in Australian standard *AS 4970 – 2009 Protection of trees*

on development Sites (**Appendix D**). These works should only be conducted under supervision of the project arborist. The use of “soft” construction methods including manual and vacuum removal of soils is recommended for works conducted within the TPZ of Trees to be retained.

7.3 Other Recommendations

- Clothing, equipment and boots should be clean and sanitised prior to each site visit to prevent onsite introduction of plant pests and diseases such as Myrtle rust.
- Vehicles and construction equipment should utilise designated entry and egress points to avoid potential of impacts on Trees to be retained.

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Figure 7 - Tree Protection Plan

Date: April 2025

Location: 40 Myoora Road, Terrey Hills, NSW

Client: H & E Architects

AEP ref: 3550

8.0 Conclusion

The recommendations for tree retention and removal have been made with consideration of minimising Arboricultural impacts.

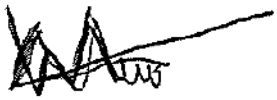
Based on the proposed tree retention and removal outlined above, the current development footprint will require the direct removal of 29 assessed trees, comprising eleven (11) individual trees and one (1) stand containing 18 trees. Thirteen (13) assessed trees located outside the development footprint can be retained, with seven (7) of these requiring Tree Protection Measures, including the installation of Tree Protection Fencing.

Please note that assessment of tree removal and retention has been made with regards to a limited concept plan. These recommendations may be subject to change once further design and engineering detail has been prepared and this report will require updating in accordance with these changes.

The implementation of a detailed Tree Protection Plan and Tree Protection measures will be an essential part of the Construction Environment Management Plan to avoid further loss of trees in close proximity to the construction footprint.

We trust this meets your requirements. Should you require further details or clarification, please do not hesitate to contact the undersigned.

Yours faithfully,



Warwick Muir

Ecologist / Arborist

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9.0 References

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Appendix A – Tree Schedule

Appendix A– Assessed Tree Schedule

Tree ID	*Scientific Name*	Common Name	DBH (m)	DAB (m)	Height (m)	Age Class	Health	Structure	Landscape significance rating	Estimated life expectancy	Retention Value	TPZ (m)	SRZ (m)	Remove/Retain
1	*Eucalyptus grandis*	Flooded gum	7.08	0.62	30	Mature	Good	Good	High	15-40	High	7.1	2.7	Remove (Footprint)
2	*Eucalyptus grandis*	Flooded gum	3.42	0.34	25	Mature	Good	Good	High	15-40	High	3.4	2.1	Remove (Footprint)
3	*Eucalyptus grandis*	Flooded gum	2.88	0.27	25	Mature	Good	Good	High	15-40	High	2.9	1.9	Remove (Footprint)
4	*Eucalyptus grandis*	Flooded gum	2.28	0.35	25	Mature	Good	Fair	High	5-15	High	2.7	2.1	Remove (Footprint)
5	*Eucalyptus grandis*	Flooded gum	2.88	0.28	24	Mature	Fair	Good	High	15-40	High	3.0	1.9	Remove (Footprint)
6	*Eucalyptus grandis*	Flooded gum	5.94	0.55	28	Mature	Good	Good	High	15-40	High	5.9	2.6	Remove (SRZ Encroachment)
7	*Eucalyptus grandis*	Flooded gum	7.38	0.65	28	Mature	Good	Good	High	15-40	High	8.0	2.8	Remove (SRZ Encroachment)
8	*Eucalyptus grandis*	Flooded gum	6.24	0.67	32	Mature	Good	Good	High	15-40	High	6.2	2.8	Retain (Protection)
9	*Eucalyptus grandis*	Flooded gum	4.68	0.43	29	Mature	Good	Good	High	15-40	High	4.7	2.3	Retain
10	*Eucalyptus grandis*	Flooded gum	9.54	0.85	35	Mature	Fair	Good	High	15-40	High	9.5	3.1	Retain
11	*Eucalyptus grandis*	Flooded gum	7.32	0.66	32	Mature	Good	Good	High	15-40	High	7.3	2.8	Retain (Protection)
12	*Eucalyptus grandis*	Flooded gum	11.22	1.02	32	Mature	Good	Good	High	15-40	High	11.2	3.3	Retain (Protection)
15	*Ceratopetalum gummiferum*	NSW Christmas Bush	3.42	0.67	5.5	Mature	Poor	Poor	Low	<5	Low	6.3	2.8	Remove (Footprint)
18	*Eucalyptus cinerea*	Argyle Apple	5.82	0.50	22	Mature	Poor	Fair	Moderate	15-40	High	5.8	2.5	Retain (Protection)
19	*Eucalyptus cinerea*	Argyle Apple	4.98	0.56	22	Mature	Good	Fair	Moderate	15-40	High	6.6	2.6	Retain
20	*Eucalyptus cinerea*	Argyle Apple	5.82	0.59	21	Mature	Good	Good	Moderate	15-40	High	5.8	2.7	Retain
24	*Casuarina glauca*	Swamp Oak	5.76	0.60	27	Mature	Good	Good	Moderate	15-40	Moderate	5.8	2.7	Remove (Footprint)
32	*Eucalyptus grandis*	Flooded gum	0.12	0.16	10	Semi-Mature	Fair	Fair	High	15-40	Moderate	2.0	1.5	Remove (Footprint)

Tree ID	*Scientific Name*	Common Name	DBH (m)	DAB (m)	Height (m)	Age Class	Health	Structure	Landscape significance rating	Estimated life expectancy	Retention Value	TPZ (m)	SRZ (m)	Remove/Retain
33	*Eucalyptus grandis*	Flooded gum	1.05	1.21	16	Over-Mature	Poor	Poor	Low	<5	Low	12.6	3.6	Retain (Protection)
35	*Eucalyptus grandis*	Flooded gum	1.00	1.17	26	Mature	Good	Good	Moderate	15-40	Moderate	12.0	3.5	Retain (Protection)
34	*Eucalyptus grandis*	Flooded gum	0.24	0.29	16	Mature	Good	Good	Moderate	15-40	Moderate	2.9	2.0	Retain
37	*Cyathea cooperi*	Straw Treefern	0.21	0.21	6	Mature	Good	Good	Moderate	15-40	Moderate	2.5	1.7	Retain (Protection)
38	*Eucalyptus grandis*	Flooded gum	0.21	0.25	14	Mature	Good	Fair	Moderate	15-40	Moderate	2.5	1.8	Retain
47	*Casuarina glauca*	Swamp Oak	0.90	0.12	12	Mature	Good	Fair	Moderate	15-40	Moderate	10.8	1.5	Remove (Footprint)

Appendix A2 – Assessed Stand Schedule

Stand ID	Approximate Number of Individuals	*Scientific Name*	Common Name	DBH (m)	DAB (m)	Height (m)	Age Class	Health	Structure	Landscape significance rating	Estimated life expectancy	Retention Value	TPZ (m)	SRZ (m)	Remove / Retain
1	18	*Cupresses sp.*	Cypress	0.31	0.36	12	Mature	Fair	Fair	Moderate	15-40	Moderate	3.7	2.2	Remove (Footprint)

Appendix B – Glossary

GLOSSARY

Age Classes:

- Juvenile refers to an immature tree;
- Semi-mature refers to a tree between immaturity and full size;
- Mature refers to a full-sized tree with some capacity for further growth; and
- Over-mature refers to a tree already in decline.

Diameter at breast height (DBH): Tree stem diameter at 1.4 metres above ground level.

Diameter at buttress (DAB): Tree stem diameter as measured above the root buttress at ground level.

Tree Protection Zone (TPZ):

An indicative measure of the area necessary to protect for tree viability, encompassing the area necessary to protect both the crown and woody roots as calculated by the formula TPZ= DBH x 12

Structural Root Zone (SRZ):

An indicative measure of the spread of the primary woody and structural roots necessary for tree stability, as calculated by the formula SRZ= $(DAB*50)^{0.42}x0.64$

Visual Tree Assessment (VTA):

Visual inspection of tree only.

Co-dominant leaders

A tree where two or more stems are of similar diameter.

Included Bark Junctions

A junction where the angle of the union creates an area of ingrown bark. This can create a structural weakness, and is often found on co-dominant stems.

Crown

The portion of the tree consisting of branches and leaves and any part of the trunk from which branches arise.

Stem

The position of the tree consisting of branches and leaves and any part of the trunk from which branches arise. An organ which supports branches, leaves, flowers and fruits.

Epicormic Growth

Refers to shoots produced by dormant buds within the bark or stem of a tree as a result of stress, incorrect pruning or increased light.

Health Condition

Exceptional

- Visually complete crown with dense foliage throughout that indicates strong health and vigour.
- Leaf size and colour that is true to type for the species and free from pest (insect) and disease (pathogen) damage.
- Expected levels of primary growth or seasonal extension and internodal growth evident for the species.
- No evidence of colonising saprophytes and no deadwood evident.

Good

- Visually complete crown, varying in foliage density throughout.
- Leaf size and colour that is true to type for the species with none or minor levels of pest (insect) and/or disease (pathogen) damage evident.
- Expected levels of primary growth or seasonal extension and internodal growth evident for the species.
- No evidence of colonising saprophytes and low levels of deadwood present and approximately 10mm or less in size.

Fair

- Sparse crown, varying in foliage density throughout.
- Reduced leaf size and atypical in colour for the species.
- Low to medium levels of pest (insect) and/or disease (pathogen) damage.
- Reduced, seasonal extension and internodal growth.
- Deadwood easily visible and less than approximately 30mm in size.
- Epicormic growth may be evident.

Poor

- Obvious signs of crown decline, exhibiting significant reduction in live crown volume and foliage density with reduced leaf size and atypical in colour for the species.
- Evidence of defoliation and/or dieback of branch tips.
- Medium to high levels of pest (insect) and disease (pathogen) damage.
- Presence of exudates (kino and resins) from wounds (open and/or weeping).
- Significant reduction in seasonal extension and internodal growth, with significant levels of epicormic growth evident.
- Deadwood easily visible, approximately 30mm to 100mm in size.

Dead

- No evidence of live foliage observed throughout the crown.
- Obvious signs of cracking and shrinking wood.
- Visible evidence of delaminating bark to stems and branches.

Structure Condition

Very Good

- Strong branch unions at attachment points with no acute angles (compression and tension forks) and good branch taper at unions.
- No visibly, defective tree parts or structural defects.
- No wounds to stems and branches, no crossing and rubbing of branches and no wounds to exposed roots.
- No fungal fruiting bodies present to stems, branches and roots indicating, a presence of fungal pathogens.

Good to Fair

- Developing inclusions at unions of leading, codominant stems and branches.
- Evidence of defective tree parts (low levels) including branch and stem inclusions and crossing and rubbing of branches.
- Evidence of mechanical damage to periderm of stems, branches and roots, exposing vascular tissues.
- Exposed wounds for surface, colonising pathogens and entry points for developing decay.
- Presence of fungal fruiting bodies.
- Some evidence of cavities or hollows. (Fair only)
- No evidence of soil upheaval surrounding base of tree.

Poor

- Obvious signs and evidence of included bark to basal unions of codominant, leading stems and branches.
- Advanced, structural defects evident with failure of tree parts determined within 5 years from time of inspection and assessment.
- Evidence of decay from open wounds with presence of exudates (kino and resins) and exposed and degraded woody tissues.
- Presence of fungal fruiting bodies.
- Presence of cavities and hollows.
- Evidence of mechanical damage with advanced degradation of exposed roots.

a) Hazardous Tree

b) Immediate Removal

- Advanced, structural defects evident. Open cracks to codominant stem and branch unions evident.
- Previous branch and stem failures evident. Failure of remaining tree parts determined within 3 months 6 months, from time of inspection and assessment. Arboricultural works to be scheduled immediately to mitigate associated hazard and risk.
- Severed roots and soil upheaval evident indicating failure of root zone.
- Tree failure imminent within 12 months from time of inspection and assessment

Landscape Significance

Assesses a tree within the landscape and rates according to criteria taken from Morton (2006):

1. Significant

- The subject tree is listed as a Heritage Item under the Local Environment Plan (LEP) with a local, state or national level of significance; or
- The subject tree forms part of the curtilage of a Heritage Item (building / structure /artifact as defined under the LEP) and has a known or documented association with that item; or

- The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event; or
- The subject tree is scheduled as a Threatened Species or is a key indicator species of an Endangered Ecological Community as defined under the or Biodiversity Conservation Act 2016 (NSW) or The Environmental Protection and Biodiversity Conservation Act 1999 (Federal); or
- The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species; or
- The subject tree is a Remnant Tree, being a tree in existence prior to development of the area; or
- The subject tree has a very large live crown size exceeding 300m² with normal to dense foliage cover, is located in a visually prominent in the landscape, exhibits very good form and habit typical of the species and makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity; or
- The tree is visually prominent in view from surrounding areas, being a landmark or visible from a considerable distance.

2. Very high

- The tree has a strong historical association with a heritage item (building/structure/artifact/garden etc) within or adjacent the property and/or
- Exemplifies a particular era or style of landscape design associated with the original development of the site; or
- The subject tree is listed on Council's Significant Tree Register; or
- The tree is a locally-indigenous species and representative of the original vegetation of the area and the tree is located within a defined Vegetation Link/ Wildlife Corridor or has known wildlife habitat value;
- The subject tree has a very large live crown size exceeding 200m²; a crown density exceeding 70% Crown Cover (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.

3. High

- The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence; or
- The tree is a locally-indigenous species and representative of the original vegetation of the area; or
- The subject tree has a large live crown size exceeding 100m²; and
- The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (eg crown distortion/suppression) with a crown density of at least 70% Crown Cover (normal); and the subject tree is visible from the street and surrounding properties and makes a positive contribution to the visual character and the amenity of the area.

4. Moderate

- The subject tree has a medium live crown size exceeding 40m²; and
- The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% Crown Cover (thinning to normal); and
- The tree makes a fair contribution to the visual character and amenity of the area; and
- The tree is visible from surrounding properties, but is not visually prominent – view may be partially obscured by other vegetation or built forms.
- The tree has no known or suspected historical association

5. Low

- The subject tree has a small live crown size of less than 40m² and can be replaced within the short term with new tree planting; or
- The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50% Crown Cover (sparse); and
- The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area.

6. Very low

- The subject tree is listed as an Environment Weed Species in the relevant Local Government Area, being invasive, or a nuisance species.
- The subject tree is scheduled as exempt (not protected) under the provisions of the local Council's Tree Preservation Order due to its species, nuisance or position relative to buildings or other structures.

7. Insignificant

- The tree is a declared Noxious Weed under the Biosecurity Act (NSW) 2015 or identified as a priority weed within the local region.

Appendix C – Site Photographs

Plate 1 Above: Tree 15 – *Ceratopetalum gummiferum* cracks along the stem.

Plate 2 Below: Tree 35 – *Eucalyptus grandis* with evidence of previous failures.

Plate 3 Below: Stand 1 – *Cupresses sp.* facing north-west.

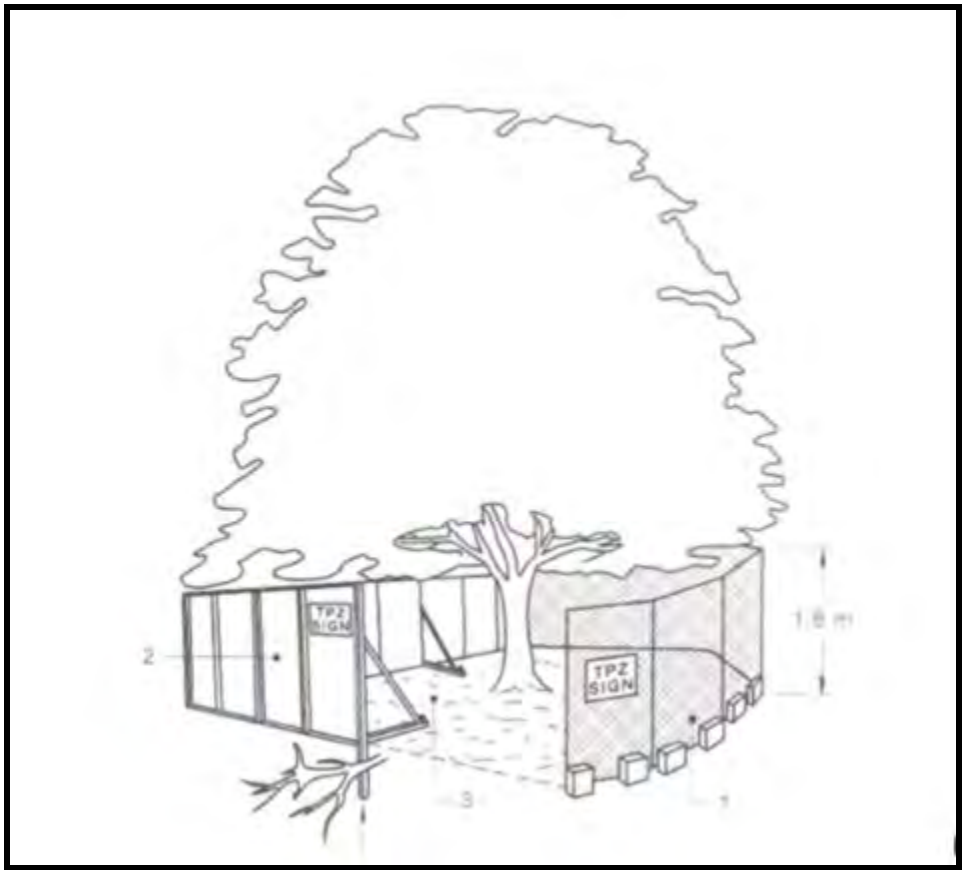
Appendix D – Tree Protection Fencing and Ground Protection

Example of tree protection fencing:

1. Fence off all trees noted for retention with 1.8m steel mesh fencing at the perimeter of the designated protection zone. Attach signs relating to the importance of tree protection and penalties for breaching tree protection orders to the fencing. If the area is large, install multiple signs.

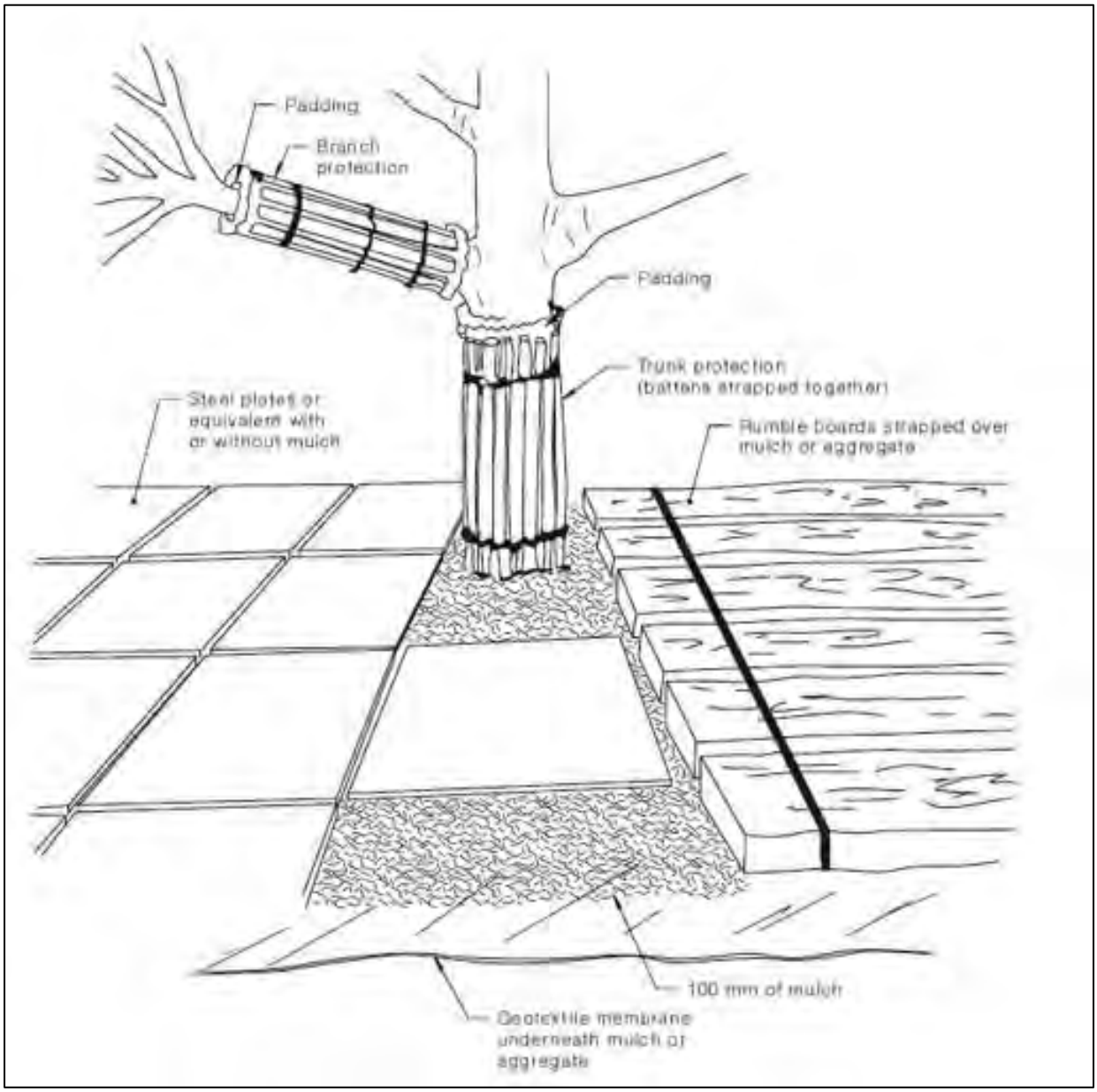
2. Signs should state that this is a restricted area, no entry unless in the company of the arborist. Authorised access to the protected zone could be through a locked gate or via ladders

3. Mulching and semi-regular watering for established protection zones.



Ground Protection

If temporary access for machinery is required within the TPZ ground protection measures will be required. The purpose is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile beneath a layer a mulch or crushed rock below rumble boards as per the below diagram.



Notes:

1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to the trees, not nailed or screwed.
2. Rumble boards should be of suitable thickness to prevent compaction and root damage.