



Sustainable  
Tree Management

1/33 Colemans Road, Carrum Downs VIC 3201

## Arboricultural Impact Assessment

Site address  
85-93 Wilson Street, Brighton 3186

Report prepared for  
Knowles Group



### ADVERTISED PLAN

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Member 2025-26



## TABLE OF CONTENTS

1. EXECUTIVE SUMMARY .....	2
2. INTRODUCTION .....	3
3. REPORT SCOPE AND OBJECTIVES .....	4
4. SITE OVERVIEW .....	5
4.1. PLANNING CONSIDERATIONS .....	6
5. SURVEY METHODOLOGY .....	9
6. DOCUMENTS VIEWED IN PREPARATION OF THIS REPORT .....	9
7. ARBORICULTURAL ASSESSMENT .....	10
7.1. TABLED TREE DATA .....	11
7.2. DEMOLITION PLAN.....	12
7.2. GROUND FLOOR PLAN .....	13
7.3. BASEMENT FLOOR PLAN .....	14
8. OBSERVATIONS .....	15
9. CONCLUSION.....	18
APPENDIX A – INDIVIDUAL TREE DATA TABLES .....	19
APPENDIX B – SITE PHOTOGRAPHS .....	27
APPENDIX C - TREE PROTECTION GUIDELINES .....	28
APPENDIX D - REFERENCES.....	31
APPENDIX E - QUALIFICATIONS AND EXPERIENCE OF CONSULTANT.....	32
APPENDIX F - GLOSSARY OF TERMS.....	33
APPENDIX G - TERMS AND CONDITIONS .....	38

## VERSION CONTROL

Version	Date	Author	Amendment/Notes
1	1/09/2025	BP, LS	Initial release.
2	12/11/2025	BP, LS	Updated Plans, Amendments to reflect changes.

## 1. EXECUTIVE SUMMARY

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This Arboricultural Impact Assessment (AIA) supports the proposed redevelopment of 85–93 Wilson Street, Brighton, for the construction of an aged care facility. All trees growing on and adjacent to the site were assessed including both council street trees, neighbouring trees and privately owned vegetation.

### Tree Retention and Protection

- The majority of trees are in fair health and structure, with medium to high retention value.
- Council street trees, predominantly Queensland Brush Box (*Lophostemon confertus*), are high-value assets suitable for retention with no proposed adverse impacts.
- Several high retention value on-site trees, including one mature Deodar Cedar (*Cedrus deodara*) and two Sweetgums (*Liquidambar styraciflua*), provide long-term site and streetscape amenity and will be successfully retained with appropriate protection.

### TPZ Encroachments

- Encroachments into Tree Protection Zones (TPZs) are mostly minor and within AS4970-2009 thresholds.
- Tree 1 (Deodar Cedar) and Tree 4 (Liquidambar) have 13.1% and 11.7% TPZ encroachments respectively, however buildings and hard stand occupied part of the impacted TPZ areas, likely limiting root growth. With arborist supervision and monitoring during construction, Tree 1 and Tree 4 will tolerate all proposed works.

### Tree Removal and Planning Compliance

Two trees protected under the Bayside Local Law are nominated for removal:

- *Agonis flexuosa* (Willow Myrtle – Tree 11) of low retention value due to poor health and structure.
- *Jacaranda mimosifolia* (Tree 2), which offers moderate on-site amenity, but limited public benefit, due to its size and central location within the site.
- Several small garden-variety trees and shrubs (e.g., Silver Birch, Italian Cypress, Desert Ash, Camellia) will also be removed. These are of low retention value and exempt from permit requirements.

### Recommendations

Trees approved for retention should be protected in accordance with AS4970-2009 Protection of Trees on Development Sites during all site development works.

## 2. INTRODUCTION

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This Arboricultural Impact Assessment has been prepared for Knowles Group to accompany a Planning Permit Application with Bayside City Council for the redevelopment of the land for the construction of an aged care facility at 85-93 Wilson Street, Brighton.

This assessment evaluates the potential impacts of the development on existing trees nominated for retention. Focusing on their calculated Tree Protection Zones (TPZs) as a key constraint is required to ensure compliance with planning regulations and promote sustainable integration with the surrounding landscape.

Recommendations are based on an evaluation of tree health, structure and condition, with commentary on the potential loss of visual landscape or streetscape amenity and the ecological or aesthetic significance of the trees to the local environment.

Trees identified as worthy of retention are provided with protection guidelines in accordance with Australian Standard 4970-2009 Protection of Trees on Development Sites (AS4970-2009). These guidelines do not constitute a comprehensive Tree Management Plan or Tree Protection Plan.

It is noted that the insertion of Clause 52.37 into the Planning Scheme occurred on the 15th of September 2025 by planning scheme amendment VC289.

Prior to this, the former buildings were demolished, and all trees were removed with the exception of those being retained and incorporated into the development proposal.

### 3. REPORT SCOPE AND OBJECTIVES

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Sustainable Tree Management Pty Ltd was engaged by Knowles Group Pty Ltd to prepare a Preliminary Arboricultural Assessment. Post incorporating recommendations provided by Sustainable Tree Management concept design plans were prepared by Knowles Group and finally an Arboricultural Impact Assessment for trees growing on and adjacent to the site located at 85-93 Wilson Street, Brighton was commissioned.

This Arboricultural Impact Assessment contains a detailed examination of all trees that could be potentially impacted by the proposed aged care facility, ensuring a holistic approach that integrates arboricultural, environmental and urban planning considerations.

This assessment is designed to provide actionable insights for Knowles Group, Bayside City Council and other stakeholders, by combining multiple field inspections and compliance checks with relevant planning frameworks. The scope includes trees on the subject site and those on adjacent private and Council owned land, where development impacts may occur, addressing both ecological contributions and community amenity.

By prioritising sustainable outcomes, this Report supports the project's objective of creating a modern, community-oriented facility, minimising adverse effects on the local tree population, while enhancing the landscape character with suitable replanting.

Report objectives include:

- Identify trees protected under the Bayside City Council Local Law No.2;
- Assess the health, structure, and condition of established trees on the site and in proximity to the common boundaries;
- Evaluate tree suitability for retention based on observed characteristics and proposed development impacts;
- Calculate Tree Protection Zones (TPZs) and Structural Root Zones (SRZs) to quantify encroachments by the proposed development; and
- Determine the feasibility of tree retention in the context of the proposed development and provide tree protection guidelines in accordance with Australian Standard 4970-2009 Protection of Trees on Development Sites (AS4970-2009).

## 4. SITE OVERVIEW

The subject site is located on the south side of Wilson Street and comprises a total area of approximately 6,344 m<sup>2</sup>. Additional adjoining land parcels forming part of the proposed development include 10 Alverna Grove, 12 Alverna Grove, 14 Alverna Grove and 16A Alverna Grove.

The site is/was predominantly occupied by existing buildings and hardstand areas, with most of the significant vegetation confined to the property boundaries, particularly along its rear boundary to Alverna Grove. All trees were individually assessed growing on, or immediately adjacent to, the site. An aerial overview of the subject land is provided in the Nearmap image below (Figure 1).



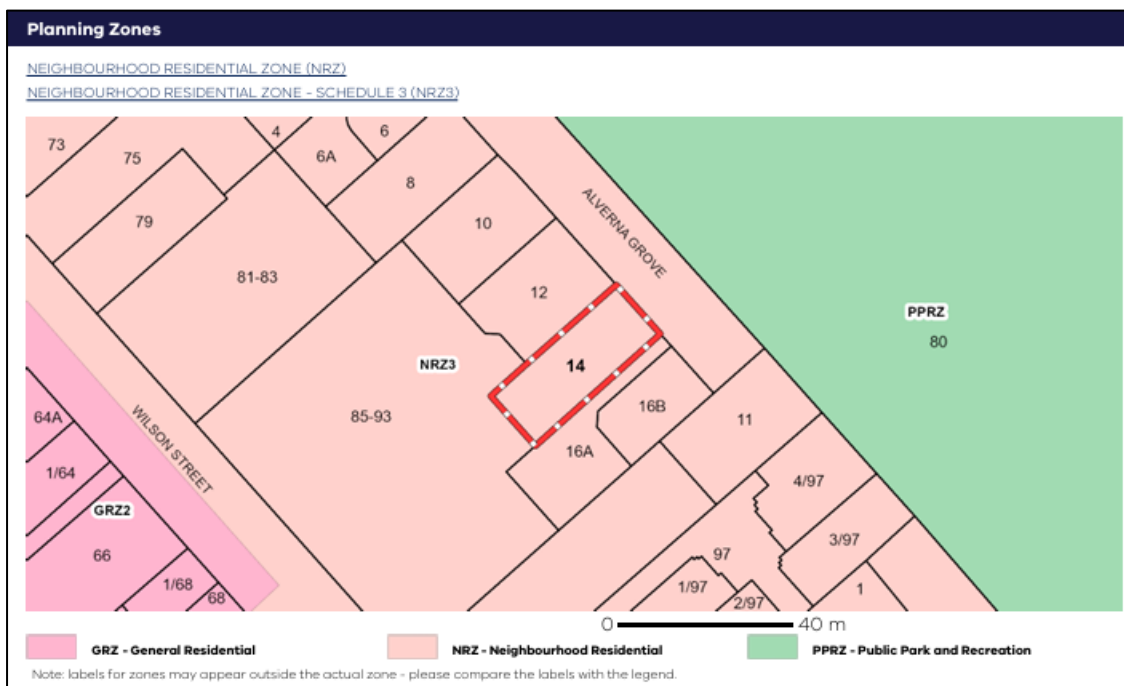
Figure 1. Aerial Nearmap image dated 4<sup>th</sup> August 2025.

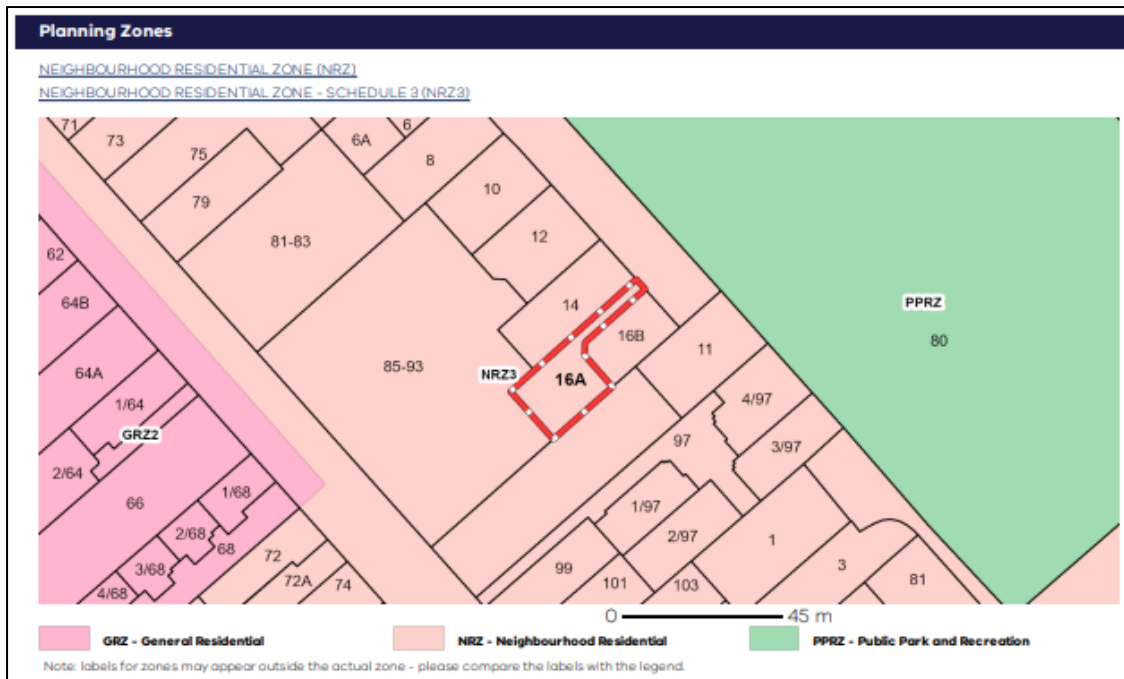
### 4.1. PLANNING CONSIDERATIONS

The subject sites are located within a Neighbourhood Residential Zone – Schedule 3 (NRZ3) under the provisions of the Bayside Planning Scheme, and no specific Vegetation Planning Overlays are applicable, however the land is governed by the City of Bayside Tree Local Law No.2 ‘Neighbourhood Amenity’ April 2012.

<b>PROPERTY DETAILS</b>			
Address:	<b>85-93 WILSON STREET BRIGHTON 3186</b>		
Lot and Plan Number:	<b>Plan PC355954</b>		
Standard Parcel Identifier (SPI):	<b>PC355954</b>		
Local Government Area (Council):	<b>BAYSIDE</b>	<a href="http://www.bayside.vic.gov.au">www.bayside.vic.gov.au</a>	
Council Property Number:	<b>60400</b>		
Planning Scheme:	<b>Bayside</b>	<a href="#">Planning Scheme - Bayside</a>	
Directory Reference:	<b>Melway 67 G11</b>		
<b>UTILITIES</b>		<b>STATE ELECTORATES</b>	
Rural Water Corporation:	<b>Southern Rural Water</b>	Legislative Council:	<b>SOUTHERN METROPOLITAN</b>
Melbourne Water Retailer:	<b>South East Water</b>	Legislative Assembly:	<b>BRIGHTON</b>
Melbourne Water:	<b>Inside drainage boundary</b>		
Power Distributor:	<b>UNITED ENERGY</b>	<b>OTHER</b>	
		Registered Aboriginal Party:	<b>Bunurong Land Council Aboriginal Corporation</b>
<a href="#">View location in VicPlan</a>			
<b>Planning Zones</b>			
NEIGHBOURHOOD RESIDENTIAL ZONE (NRZ)			
NEIGHBOURHOOD RESIDENTIAL ZONE - SCHEDULE 3 (NRZ3)			
<ul style="list-style-type: none"> <li>GRZ - General Residential</li> <li>PUZ2 - Public Use-Education</li> </ul>	<ul style="list-style-type: none"> <li>NRZ - Neighbourhood Residential</li> <li>TRZ1 - State Transport Infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>PPRZ - Public Park and Recreation</li> <li>Railway line</li> </ul>	<p>0 95 m</p>

Figure 2. General Residential Zone – Schedule 2 (GRZ2)





### Local Law permit

A permit is required to prune or remove:

- a tree with a single or combined trunk circumference greater than 155cm measured at 1m above ground level.
- a tree listed on Council's Register of Significant Trees
- a tree planted in accordance with the replacement planting condition of a Local Law permit

**Single trunk trees -**  
If trunk circumference is greater than 155cm, a Local Law permit required

Measure circumference at 1m above ground level

**Multi trunk trees –** Add together circumferences of all trunks (if more than 4 – measure only 4 largest)

Measure circumference at 1m above ground level

**A Local Law permit is not required if the work meets the following exemptions:**

- i) A permit is not required to prune a tree if the work is to be carried out by an arborist trained to AQF Level 3 in Arboriculture, or above, or equivalent recognised and relevant experience that enables them to perform the tasks required by Australian Standard No. 4373, 2007 *Pruning of Amenity Trees*.  
The contractor must certify their work, including photographs before and after work.
- ii) In an emergency, any tree or part of a tree that is an immediate threat to life and or property may be removed.
- iii) Any tree is exempt from protection if it is a Victorian State Government declared noxious weed species as defined by section 3 of the Catchment and Land Protection Act 1994.

Figure 3. Bayside Local Law – Tree removal and pruning

## 5. SURVEY METHODOLOGY

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The site assessment was conducted by Brendan Pike and Luke Sturgess of Sustainable Tree Management on 20 November 2024, and again by Luke Sturgess on 18 August 2025. Detailed characteristics of each tree were recorded on-site, with comprehensive data presented in Section 7.1. Individual data tables, accompanied by identification images for each assessed tree, are included in Appendix A.

Images of proposed development plans, incorporating Structural Root Zones (SRZs), Tree Protection Zones (TPZs) and calculated TPZ encroachments, are provided in Sections 7.2 - 7.4.

Each tree was classified as high, medium, or low retention value and evaluated for genus and species, estimated height, canopy spread, health, structure, age class, significance, retention value, diameter at breast height (DBH), TPZ and SRZ. Abbreviations used are defined in the Glossary of Terms in Appendix F.

The survey and assessment of the trees was based on visual inspections from ground level. No trees were climbed, and no samples of soil, plant material, or pest and disease infestations were collected for analysis. Species identification was performed in the field, based on common characteristics, without verification from the National Herbarium of Victoria.

This Report excludes defects not visible during the ground-based visual inspection and reflects the condition of the trees solely at the time of assessment.

## 6. DOCUMENTS VIEWED IN PREPARATION OF THIS REPORT

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The following documents were viewed in preparation of this Report:

- Aerial photography of the site (Nearmap, dated 4 August 2025);
- Demolition Site Plan (STUDIO MCCUE, Project No. 24021 Rev D, dated 12/11/2025);
- Ground Floor Plan (STUDIO MCCUE, Project No. 24021 Rev E, dated 12/11/2025);
- Basement Floor Plan (STUDIO MCCUE, Project No. 24021 Rev E, dated 12/11/2025);
- Bayside Planning Scheme;
- Bayside Significant Tree Register;
- Bayside Local Law;
- Planning Property Report (VicPlan, dated 1 September 2025).

## 7. ARBORICULTURAL ASSESSMENT

The following fifteen (15) individual trees are protected specimens due to growing locations (third party owned trees) and in some circumstances City of Bayside Tree Local Law No.2 'Neighbourhood Amenity' April 2012.

The subsequent trees have been assessed as being of high, medium, or low retention value. All third party owned assets, including Council and neighbouring trees, are assessed as high retention value regardless of their overall health and condition. DBH (cm) is the Diameter at breast height measured 1.4m from natural ground level, SRZ (m) is the structural root zone in metres in a radius from the centre of the trunk and TPZ (m) is the tree protection zone in metres in a radius from the centre of the trunk. The encroachment (%) is the level of encroachment into the tree protection zone of each tree. If the proposed encroachment is less than 10% of the area of the TPZ and is outside of the SRZ a detailed root investigation is not required. Any proposed encroachment of greater than 10% of the TPZ or inside the SRZ of tree(s), the project Arborist must demonstrate the tree(s) will remain viable. These measurements and distances are derived from the Australian Standard AS4970 - 2009 Protection of Trees on Development sites.

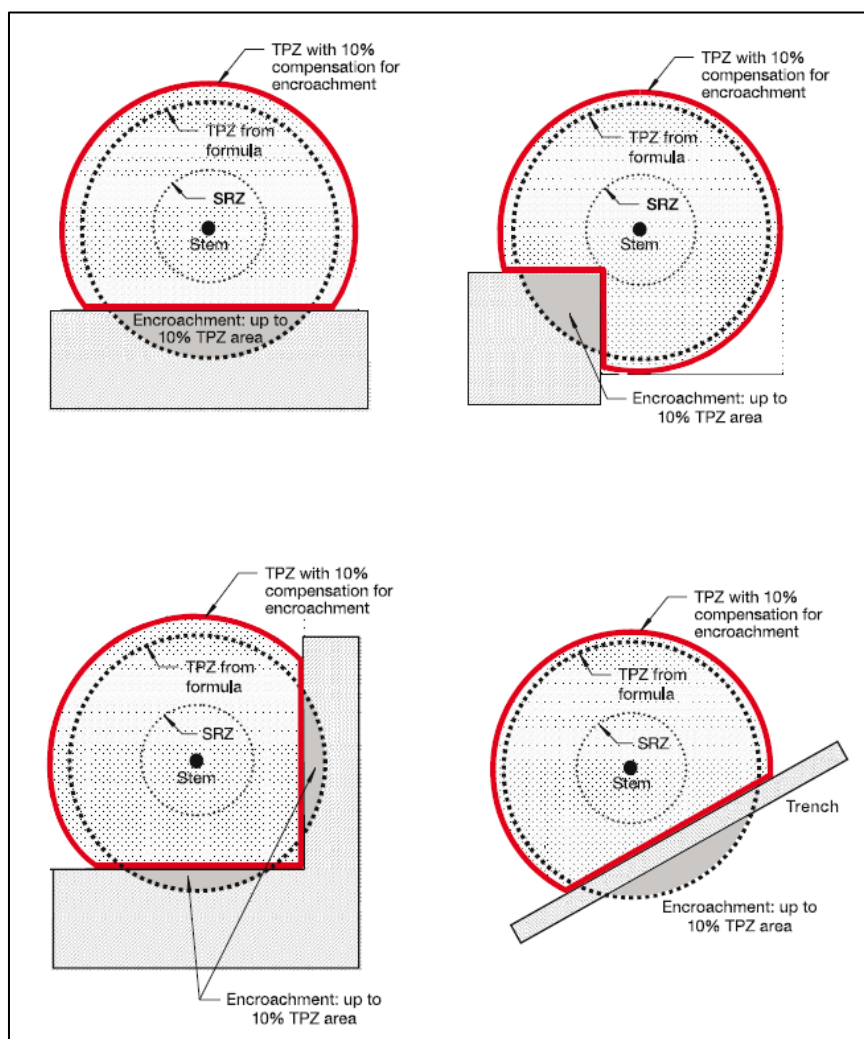


Figure 4: Extract: AS4970-2009.

## 7.1. TABLED TREE DATA

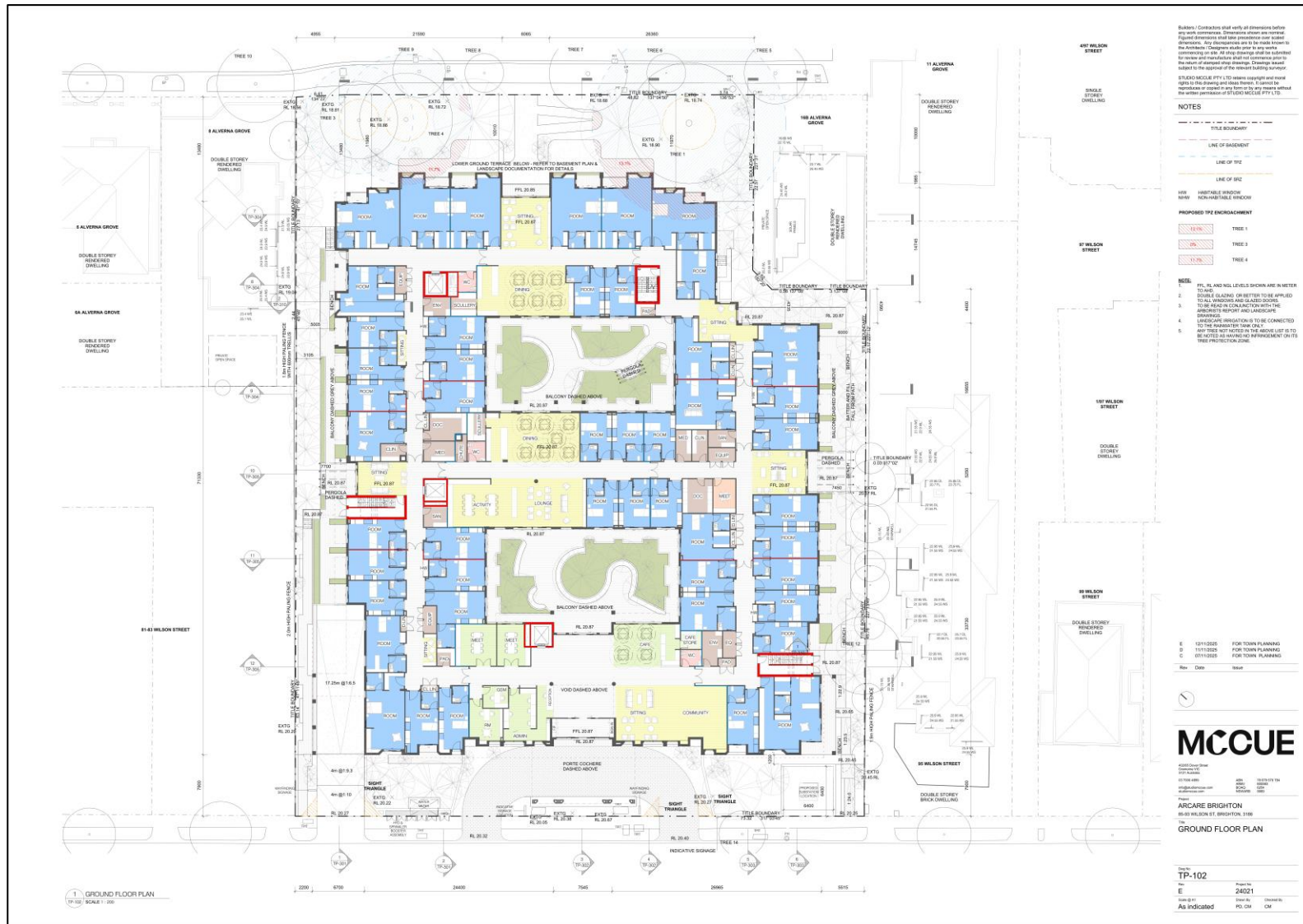
Table 1. Tree Data

Tree No.	Genus/Species	Common Name	Location	Origin	DBH (m)	SRZ (m)	TPZ (m)	Height (m)	Spread (m)	Health	Structure	Age Class	ULE	Site Significance	Retention Value	Impact (AS4970)	Planning Control
1	Cedrus deodara	Deodar Cedar	On Site	Exotic	104	3.4	12.5	20	16/16	Fair	Fair	Mature	Long	High	High	13.10%	Local Law
2	Jacaranda mimosifolia	Jacaranda	On Site	Exotic	60	2.7	7.2	12	8/8	Fair	Fair	Semi mature	Medium	Medium	Medium	Remove	Local Law
3	Liquidambar styraciflua	Sweetgum	On Site	Exotic	58	2.6	7.0	15	10/10	Fair	Fair	Mature	Long	High	High	No Impact	Local Law
4	Liquidambar styraciflua	Sweetgum	On Site	Exotic	70	2.8	8.4	20	15/8	Fair	Fair	Mature	Long	High	High	11.70%	Local Law
5	Lophostemon confertus	Queensland Brush Box	Council Asset	Native (Aus)	45	2.4	5.4	8	4/5	Fair	Fair	Semi mature	Long	High	High	No Impact	Council Asset
6	Lophostemon confertus	Queensland Brush Box	Council Asset	Native (Aus)	14	1.5	2.0	5	4/1	Fair	Fair	Young	Long	Medium	High	No Impact	Council Asset
7	Lophostemon confertus	Queensland Brush Box	Council Asset	Native (Aus)	55	2.6	6.6	11	6/6	Fair	Fair	Mature	Long	High	High	No Impact	Council Asset
8	Lophostemon confertus	Queensland Brush Box	Council Asset	Native (Aus)	10	1.5	2.0	6	3/3	Fair	Fair	Young	Long	Medium	High	No Impact	Council Asset
9	Lophostemon confertus	Queensland Brush Box	Council Asset	Native (Aus)	38	2.2	4.6	12	5/5	Fair	Fair	Semi mature	Long	High	High	No Impact	Council Asset
10	Lophostemon confertus	Queensland Brush Box	Council Asset	Native (Aus)	59	2.7	7.1	13	7/7	Fair	Fair	Mature	Long	High	High	No Impact	Council Asset
11	Agonis flexuosa	Willow Myrtle	On Site	Native (Aus)	96	3.3	11.5	8	6/6	Fair/Poor	Poor	Mature	Short	Low	Low	Remove	Local Law
12	Arbutus unedo	Irish Strawberry	On Site	Exotic	61	2.7	7.3	5	5/3	Fair	Fair	Mature	Long	High	Medium	No Impact	Local Law
13	Fraxinus sp.	Ash	Council Asset	Exotic	5	1.5	2.0	1	1/1	Fair	Fair	Juvenile	Long	High	High	Remove	Council Asset
14	Fraxinus sp.	Ash	Council Asset	Exotic	21	1.7	2.5	5	2/4	Fair	Fair	Young	Long	High	High	No Impact	Council Asset
15	Ulmua parvifolia	Chinese Elm	Council Asset	Exotic	12	1.5	2.0	5	3/3	Fair	Poor	Young	Short/Medium	Medium	High	Remove	Council Asset

### 7.2. DEMOLITION PLAN



### 7.3. GROUND FLOOR PLAN





## 8. OBSERVATIONS

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This assessment has thoroughly evaluated the potential impacts on fifteen (15) trees located in proximity to the proposed construction envelope. This concept design aligns with the Bayside Planning Scheme objectives as well as Australian Standard AS4970-2009 Protection of Trees on Development Sites. The findings identify a balanced approach to integrating the development with the preservation of significant trees and minimal tree loss, thus supporting a sustainable landscape outcome.

### Ecological and Aesthetic Significance

The trees assessed within and adjacent to the site comprise an assortment of planted vegetation, including wider Australian native species and several exotic specimens. The Australian native species are represented by Queensland Brush Box (*Lophostemon confertus*), established as council street trees along the Alverna Grove nature strip. Exotic species include Sweetgum (*Liquidambar styraciflua*), located in the north part of the subject site, and a mature Deodar Cedar (*Cedrus deodara*), also situated on-site. Collectively, these trees reflect a mixture of non-indigenous native and exotic plantings, commonly utilised in residential and municipal settings for their amenity value, seasonal colour and shading qualities.

### Tree Health and Structure

Many of the trees are in fair health, with semi-mature to mature age classes and have long life expectancies. An exception to this is Tree No. 11 (pictured with tree data table page 23) which is in deteriorating health and has poor structural condition. Accordingly, Tree No. 11 has been nominated for removal to facilitate the redevelopment of land.

### TPZ Encroachments and Tree Retention

The proposed works will result in 11.7% and 13.1% encroachments into the calculated TPZs of Trees 1 and 4, respectively (see Images 3 and 4 on the following page). It is noted that existing building structures already occupy portions of these encroachment areas, thereby limiting root development within those zones. Sufficient unimpacted soil area remains available to support new root growth and regeneration post-construction. Given each tree's current health, vigour, and structural condition, Trees 3 and 4 are expected to tolerate this degree of encroachment without adverse impacts on long-term health or stability. Should roots be encountered during construction, pruning must be carried out in accordance with AS4373-2007 Pruning of Amenity Trees by a suitably qualified arborist. Root pruning should be limited to clean cuts of smaller-diameter roots only, with all works conducted under the supervision of the Project Arborist.

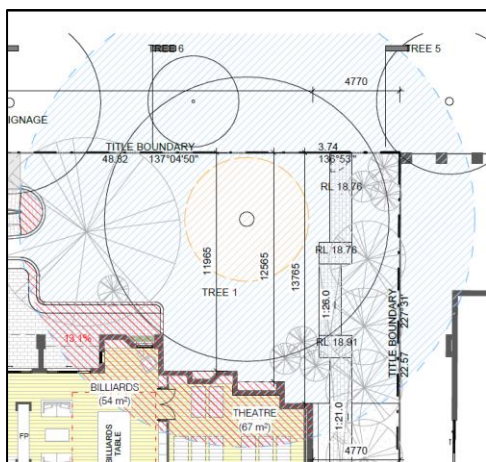


Image 3. Tree 1 TPZ encroachment.

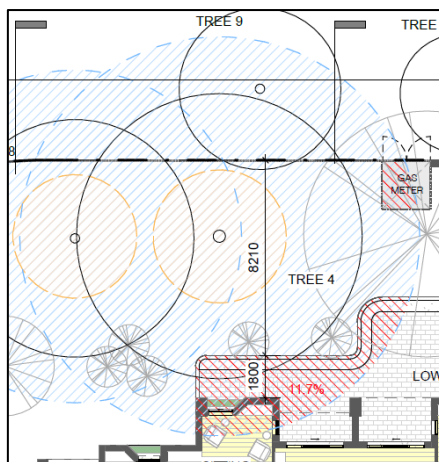


Image 4. Tree 4 TPZ encroachment.

**Tree 12 and neighbouring trees (eastern boundary)**

The subject trees are located within an elevated garden bed approximately 1.0 m in height and located adjacent the site’s east boundary. The existing change in site levels has contained tree roots within the raised garden bed and it is unlikely tree roots will extend westward into the proposed construction zone. Accordingly, proposed construction to the area west of the Tree No.12 will not impact existing root structure. When the retaining wall forming the garden bed is replaced with structurally sound materials, works should be undertaken with caution and be supervised by the Project Arborist.



Image 5. Tree 12, level change within TPZ.

**Tree Removal and Planning Compliance**

Two trees growing on site and protected by the Bayside Local Law have been nominated for removal to facilitate construction of the aged care facility. This includes the aforementioned *Agonis flexuosa* (Tree 11), which is of low retention value due to its compromised health and poor structural form, and Tree 2, a medium-sized *Jacaranda mimosifolia*. While the Jacaranda provides some seasonal colour and contributes a degree of visual interest, its amenity value is largely confined to the subject site. This is due to its central growing location within the property, which limits its broader contribution to the public realm or adjoining land. As such, its proposed removal is not expected to result in a significant loss of landscape or streetscape character (see Image 6).



Image 6. Tree 2 - *Jacaranda mimosifolia*.

It should be noted that there are several garden variety small/medium sized trees and shrubs growing on the site that are to be removed to facilitate the proposed construction and site level changes. The trees/shrubs include Silver Birch (Image 7), Italian Cypress (Image 8), Desert Ash (Image 9), Japanese camellia (Image 10), Weeping Cherry (Image 11), Chinese Elm (Images 12 and 13) and Mirror Bush (Image 14).

The subject trees and shrubs are not considered worthy of long-term retention, and their removal will enable the implementation of a strategic landscape plan that will deliver greater long-term environmental benefits. All vegetation nominated for removal is exempt from requiring a Local Law Permit, as each specimen was individually measured and confirmed to be below the applicable size thresholds.



Image 7. Silver Birch.



Image 8. Italian Cypress.



Image 9. Desert Ash.



Image 10. Japanese Camellia.



Image 11. Weeping Cherry.



Image 12. Chinese Elm.



Image 13. Chinese Elm.



Image 14. Mirror Bush.

### Council Street Tree Removal

The development proposal nominates the removal of two Council street trees growing within the Wilson Street nature strip to facilitate construction. Tree 13 (*Fraxinus sp.* - Ash) is a recently planted juvenile specimen, while Tree 15 (*Ulmus parvifolia* – Chinese Elm) is a young tree exhibiting a suppressed growth habit. Both trees are of low maturity and readily replaceable within the streetscape. Their removal will require prior consent from Council and should be undertaken in accordance with Bayside City Council's street tree removal and replacement procedures.

## 9. CONCLUSION

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The proposed development can proceed with minimal adverse impacts on the local tree population through the proposed retention of healthy, high value trees, and the implementation of tree protection measures during the site redevelopment. By adhering to tree protection guidelines in accordance with AS4970-2009, and ongoing monitoring, the development can achieve a sustainable balance between urban progress and environmental preservation. This approach not only aligns with the Bayside Planning Scheme objectives, but also maintains the site's contribution to the region's leafy character.

The trees considered to be of low retention value are not worthy of long-term retention on the site. This is due to several factors such as a decline in health and structure that cannot be improved via pruning techniques or current site conditions. In some instances defects limit the long-term retention of a number of these trees. Their removal will allow for a strategic landscape plan that will provide a greater benefit to the local landscape in the long term.

Once detailed engineering and landscaping plans for the site have been finalised, a Tree Management Plan (TMP) and Tree Protection Plan (TPP) should be prepared by a nominated Project Arborist. The TMP and TPP are used to ensure the trees endorsed for retention are not negatively impacted upon during site development and include the steps to be taken to ensure the trees are adequately protected. The TMP and TPP should be based on Australian Standard AS4970-2009/25 *Protection of Trees on Development Sites*, and it is recommended these documents are required by a condition of permit, should a permit be issued.

Should you have any questions with regards to the assessment please do not hesitate to make contact.




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## APPENDIX A – INDIVIDUAL TREE DATA TABLES


Tree Number	1	High Retention Value
Location	On Site - 14 Alverna Grove	
Genus/Species	<i>Cedrus deodara</i>	
Common Name	Deodar Cedar	
Origin	Exotic	
DBH (cm)	104	
Height (m)	20	
Spread NS (m)	16/16	
Health	Fair	
Structure	Fair	
Age Class	Mature	
Site Significance	High	
ULE	Long	
SRZ (m)	3.4	
TPZ (m)	12.5	
Encroachment (%)	13.1	
Planning Control Permit Requirement	Local Law (Council)	
Comments	<p>Successfully retain tree by providing adequate space and separation from proposed built form. Nominated for retention.</p>	


Tree Number	2	Medium Retention Value
Location	On Site	
Genus/Species	<i>Jacaranda mimosifolia</i> sp.	
Common Name	Jacaranda	
Origin	Native (Vic)	
DBH (cm)	Multi = 60	
Height (m)	12	
Spread NS (m)	8/8	
Health	Fair	
Structure	Fair	
Age Class	Semi mature	
Site Significance	Medium	
ULE	Medium	
SRZ (m)	2.7	
TPZ (m)	7.2	
Encroachment (%)	100 - Remove NA	
Planning Control Permit Requirement	Local Law (Council)	
Comments	<p>Nominated for removal.</p>	


Tree Number	3	High Retention Value
Location	On Site -10 Alverna Grove	
Genus/Species	<i>Liquidambar styraciflua</i>	
Common Name	Sweetgum	
Origin	Exotic	
DBH (cm)	58	
Height (m)	15	
Spread NS (m)	10/10	
Health	Fair	
Structure	Fair	
Age Class	Mature	
Site Significance	High	
ULE	Long	
SRZ (m)	2.6	
TPZ (m)	7.0	
Encroachment (%)	0	
Planning Control Permit Requirement	Local Law (Council)	
<b>Comments</b> Nominated for retention.		


Tree Number	4	High Retention Value
Location	On Site - 10 Alverna Grove	
Genus/Species	<i>Liquidambar styraciflua</i>	
Common Name	Sweetgum	
Origin	Exotic	
DBH (cm)	70	
Height (m)	20	
Spread NS (m)	15/8	
Health	Fair	
Structure	Fair	
Age Class	Mature	
Site Significance	High	
ULE	Long	
SRZ (m)	2.8	
TPZ (m)	8.4	
Encroachment (%)	11.7%	
Planning Control Permit Requirement	Local Law (Council)	
Nominated for retention. Comments – successfully retain tree by providing adequate space and separation from proposed built form.		


Tree Number	5	High Retention Value
Location	Council Asset	
Genus/Species	<i>Lophostemon confertus</i>	
Common Name	Queensland Brush Box	
Origin	Native (Aus)	
DBH (cm)	45	
Height (m)	8	
Spread NS (m)	4/5	
Health	Fair	
Structure	Fair	
Age Class	Semi mature	
Site Significance	High	
ULE	Long	
SRZ (m)	2.4	
TPZ (m)	5.4	
Encroachment (%)	0 NA	
Planning Control Permit Requirement	Council Asset NA	
Comments	Nominated for retention.	


Tree Number	6	High Retention Value
Location	Council Asset	
Genus/Species	<i>Lophostemon confertus</i>	
Common Name	Queensland Brush Box	
Origin	Native (Aus)	
DBH (cm)	14	
Height (m)	5	
Spread NS (m)	4/1	
Health	Fair/Poor	
Structure	Fair/Poor	
Age Class	Young	
Site Significance	Medium	
ULE	Long	
SRZ (m)	1.5	
TPZ (m)	2.0	
Encroachment (%)	0 NA	
Planning Control Permit Requirement	Council Asset NA	
Comments	Nominated for retention.	


Tree Number	7	High Retention Value
Location	Council Asset	
Genus/Species	<i>Lophostemon confertus</i>	
Common Name	Queensland Brush Box	
Origin	Native (Aus)	
DBH (cm)	55	
Height (m)	11	
Spread NS (m)	6/6	
Health	Fair	
Structure	Fair	
Age Class	Mature	
Site Significance	High	
ULE	Long	
SRZ (m)	2.6	
TPZ (m)	6.6	
Encroachment (%)	0 NA	
Planning Control Permit Requirement	Council Asset NA	
Comments	Nominated for retention.	


Tree Number	8	High Retention Value
Location	Council Asset	
Genus/Species	<i>Lophostemon confertus</i>	
Common Name	Queensland Brush Box	
Origin	Native (Aus)	
DBH (cm)	10	
Height (m)	6	
Spread NS (m)	3/3	
Health	Fair	
Structure	Fair	
Age Class	Young	
Site Significance	Medium	
ULE	Long	
SRZ (m)	1.5	
TPZ (m)	2.0	
Encroachment (%)	0 NA	
Planning Control Permit Requirement	Council Asset NA	
Comments	Nominated for retention.	


Tree Number	9	High Retention Value
Location	Council Asset	
Genus/Species	<i>Lophostemon confertus</i>	
Common Name	Queensland Brush Box	
Origin	Native (Aus)	
DBH (cm)	38	
Height (m)	12	
Spread NS (m)	5/5	
Health	Fair	
Structure	Fair	
Age Class	Semi mature	
Site Significance	High	
ULE	Long	
SRZ (m)	2.2	
TPZ (m)	4.6	
Encroachment (%)	0 NA	
Planning Control Permit Requirement	Council Asset NA	
Comments	Nominated for retention.	


Tree Number	10	High Retention Value
Location	Council Asset	
Genus/Species	<i>Lophostemon confertus</i>	
Common Name	Queensland Brush Box	
Origin	Native (Aus)	
DBH (cm)	59	
Height (m)	13	
Spread NS (m)	7/7	
Health	Fair	
Structure	Fair	
Age Class	Mature	
Site Significance	High	
ULE	Long	
SRZ (m)	2.7	
TPZ (m)	7.1	
Encroachment (%)	0 NA	
Planning Control Permit Requirement	Council Asset NA	
Comments	Nominated for retention.	

Tree Number	11	Low Retention Value
Location	On Site	
Genus/Species	<i>Agonis flexuosa</i>	
Common Name	Willow Myrtle	
Origin	Native (Aus)	
DBH (cm)	Multi = 96	
Height (m)	8	
Spread NS (m)	6/6	
Health	Fair/Poor	
Structure	Poor	
Age Class	Mature	
Site Significance	Low	
ULE	Short	
SRZ (m)	3.3	
TPZ (m)	11.5	
Encroachment (%)	100 - Remove NA	
Planning Control Permit Requirement	Local Law NA	
Comments	Nominated for removal.	

Tree Number	12	Medium Retention Value
Location	On Site	
Genus/Species	<i>Arbutus unedo</i>	
Common Name	Irish Strawberry	
Origin	Exotic	
DBH (cm)	Multi = 61	
Height (m)	5	
Spread NS (m)	5/3	
Health	Fair	
Structure	Fair/Poor	
Age Class	Mature	
Site Significance	High	
ULE	Long	
SRZ (m)	2.7	
TPZ (m)	7.3	
Encroachment (%)	NA	
Planning Control Permit Requirement	NA	
Comments	Nominated for retention.	

Tree Number	13	High Retention Value
Location	Council Asset	
Genus/Species	<i>Fraxinus sp.</i>	
Common Name	Ash	
Origin	Native (Vic)	
DBH (cm)	5	
Height (m)	1	
Spread NS (m)	1/1	
Health	Fair	
Structure	Fair	
Age Class	Juvenile	
Site Significance	Low	
ULE	Long	
SRZ (m)	1.5	
TPZ (m)	2.0	
Encroachment (%)	100	
Planning Control Permit Requirement	Council Asset	
<b>Comments</b> Recently planted specimen within the past 6 months. Nominated for removal and replacement.		

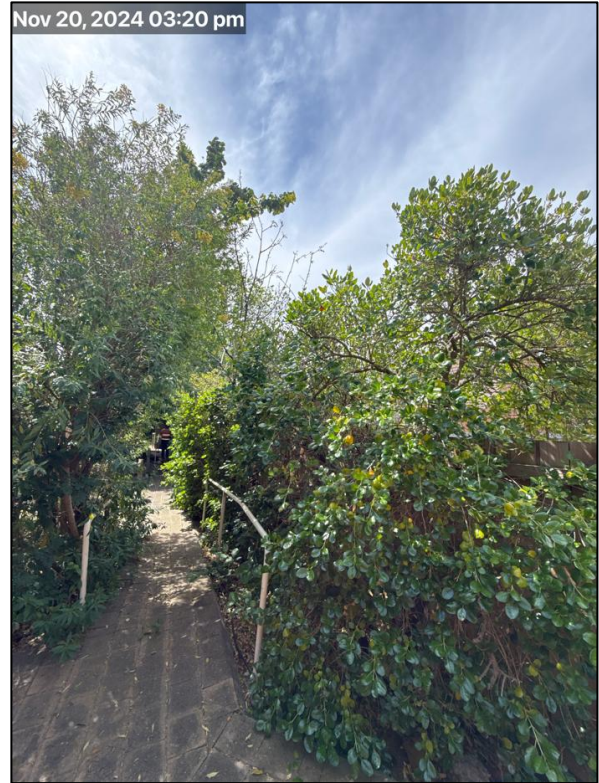
Tree Number	14	High Retention Value
Location	Council Asset	
Genus/Species	<i>Fraxinus sp.</i>	
Common Name	Ash	
Origin	Exotic	
DBH (cm)	21	
Height (m)	5	
Spread NS (m)	2/4	
Health	Fair	
Structure	Fair	
Age Class	Young	
Site Significance	High	
ULE	Long	
SRZ (m)	1.7	
TPZ (m)	2.5	
Encroachment (%)	NA	
Planning Control Permit Requirement	NA	
<b>Comments</b> Nominated for retention.		

Tree Number	15	High Retention Value
Location	Council Asset	
Genus/Species	<i>Ulmus parvifolia</i>	
Common Name	Chinese Elm	
Origin	Exotic	
DBH (cm)	12	
Height (m)	5	
Spread NS (m)	3/3	
Health	Fair	
Structure	Poor	
Age Class	Young	
Site Significance	Medium	
ULE	Short/Medium	
SRZ (m)	1.5	
TPZ (m)	2.0	
Encroachment (%)	100	
Permit Requirement	Council Asset	
<p><b>Comments</b> - Nominated for removal, suppressed growth habit with poor structure.</p>		

## APPENDIX B – SITE PHOTOGRAPHS



*Photo 1. The view of the trees growing adjacent to the site's eastern boundary.*



*Photo 2. Garden shrubs on site.*



*Photo 3. Garden shrubs on site.*



*Photo 4. Garden shrubs on site.*

## APPENDIX C - TREE PROTECTION GUIDELINES

Sustainable Tree Management assesses individual tree protection requirements based upon the Australian Standard AS4970 – 2009 ‘Protection of Trees on Development Sites’. Tree protection requirements are calculated based upon trunk diameter of the tree at breast height. These calculations produce what is referred to in this Report as the Tree Protection Zone (TPZ) and is provided as a measurement in metres in a radius from the centre of the trunk.

The TPZ is the zone in which protective measures should be applied in order to protect the tree(s) whilst maintaining the current levels of health and vigour.

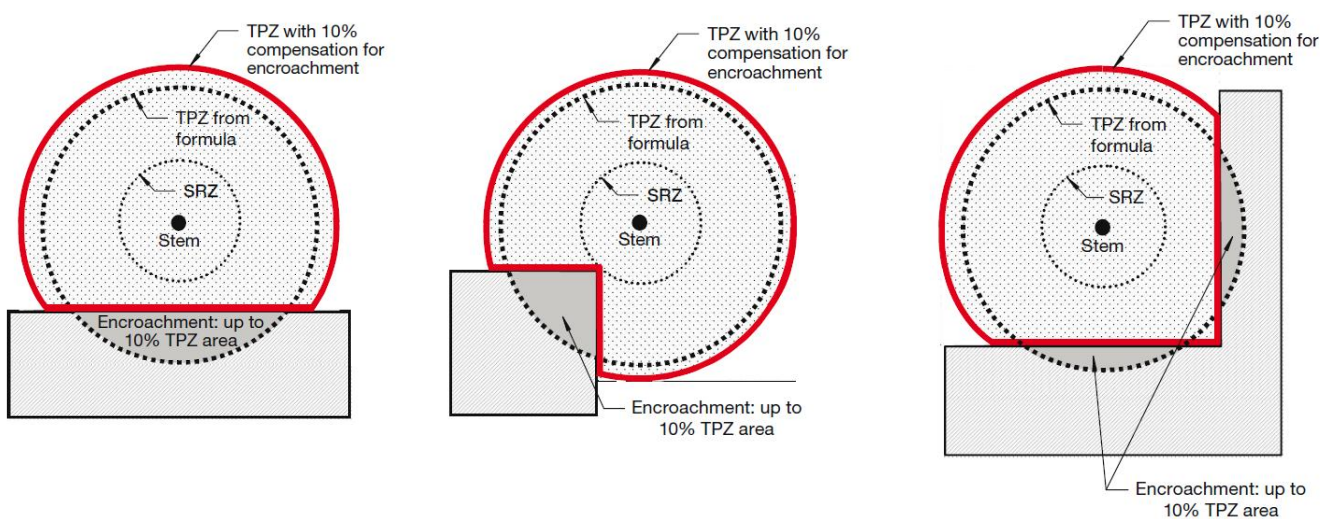
Determination of the structural root zone or the zone of rapid taper is provided as the Structural Root Zone (SRZ). The structural root zone calculations (may also be referred to as the Root Plate Radius (RPR) of the tree, based upon the Australian Standard AS4970 - 2009. The SRZ determines the minimum distance around the tree in which the structural stability of the tree is able to be maintained.

It is important to note that the SRZ only determines the root plate area or the zone of rapid taper. Excavation within this area will not only cause a decline in tree vigour but may also cause catastrophic tree failure (Coder, 1996).

Often it is difficult to protect the entire TPZ due to site constraints. In such events it is imperative that condition and species tolerance to disturbance are evaluated in conjunction with the site characteristics. Helliwell (1985) and Harris (1999) identified that a healthy tree may tolerate removal of up to one-third of its roots and possibly up to 50% in some cases, although stability may be compromised at this level.

In situations where the TPZ of a tree to be retained will be in close proximity to a proposed development or where there will be encroachment into the TPZ of a tree, a specific tree management plan should be developed. This plan provides prescriptive measures to protect trees on development sites

*Extract from Australian Standard AS 4970 - 2009 Protection of trees on Development sites*



## General Tree Protection Requirements

The following requirements are only provided only for basic guidance with the design phase for a project. These guidelines do not constitute a specific tree management plan.

- A tree protective fence should be installed at the recommended distance allocated for each tree to be retained. The fence should be located at the TPZ distance provided.
- The protection fence should be rigid (chain link or similar) and should not be less than 1.8 metres in height. Fencing should be firmly attached to a removable concrete or similar base. Alternatively, star pickets (1.5 metre spacing) and para-webbing may be used to define the tree protection area. Fencing should be in accordance with the Australian Standard for Temporary Fencing AS 4687.
- In cases where the TPZ cannot be entirely fenced, it is recommended that ground protection is used. Specific ground protection requirements will form part of a tree management plan that should be developed for each tree to be retained.
- No soil levels should be altered within the fenced TPZ area, no heavy machinery should be allowed to pass within this area and no spoil, chemicals, building materials or refuse should be stored within this area. Nothing whatsoever should be attached to the tree (excluding tape to identify a tree to be protected).
- The area within the tree protection fence should be covered with a layer of organic mulch (woodchips) to a depth of 100mm prior to the commencement of the project. Mulch material should comply with Australian Standard AS 4454.
- The tree protective fencing should be installed prior to any works (including demolition) commencing on site and should remain in place until all site development work is completed. The protective fencing should be located at the prescribed distances and clearly signed **TREE PROTECTION ZONE**. The sign should be similar to the following (*as recommended by the Australian Standard AS4970*) and should be of a size no smaller than 600mm x 400mm:



- An area should be designated on site, which is at least 10 metres distance from any optimal tree protection zone of the trees to be retained, where all building materials, chemicals etc. can be stored throughout the proposed development.
- Open trenching for underground services located within the recommended tree protection zone (TPZ) must be avoided. Should there be no alternative for service location; the services must be bored underneath the area designated as the tree protection zone. No trenching whatsoever should be used to install services within the protected area.
- Soil moisture during construction should be maintained at not less than 50% of field capacity (usually 10 litres of water per 10mm of each tree DBH per week). Irrigation may be applied by hand, automatic or manual irrigation system, or by fine spray from water tanker located outside the previously submitted exclusion zones. Water is to be applied at a volume and frequency required so as to maintain turgor and leaf retention and encourage healthy root development. The consultant Arborist should discuss variations to the amount of water to be supplied with the site or Project Manager.
- Remedial pruning works recommended to be undertaken on the subject trees must be carried out to Australian Standard AS4373 (2007) – Pruning of Amenity Trees, by a qualified Arborist. If pruning works are to be undertaken, then these works should be carried out prior to any construction works beginning on site.
- Documentation should be provided to the site manager by the consultant Arborist for each inspection during the development process which details the consultant Arborist name, date and time of inspection, the stage of development, and provides comments of what actions are required.

## APPENDIX D - REFERENCES

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## APPENDIX E - QUALIFICATIONS AND EXPERIENCE OF CONSULTANT

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### **Brendan Pike (Senior Arborist)**

Diploma in Arboriculture (AQF5) – Melbourne Polytechnic

Certificate III in Horticulture (Arboriculture)

Certificate IV in Computer Science

#### *Experience*

Consulting Arborist – Sustainable Tree Management	2019 – Present
Supervising Arborist - Antler Environmental Pty. Ltd.	2018 - 2019
Supervising Arborist - Austree Contracting Pty. Ltd.	2012 - 2018
Supervising Arborist - Arborco Australia Pty. Ltd.	2011 - 2012
Arborist/Leading Hand - Branching Out Arbor Care Pty. Ltd.	2003 - 2011

### **Luke Sturgess (Principal Arborist/Director)**

Diploma Arboriculture (AQF5)

Advanced Diploma Business Management

#### *Experience*

Director Sustainable Tree Management 16 years

Senior Vegetation Management Officer 11 years (Arborist Town Planning City of Kingston)

## APPENDIX F - GLOSSARY OF TERMS

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### **Amenity**

Although difficult to quantify, the term as used in this Report relates to the contribution given to the landscape or streetscape in terms of visual aesthetics. It may also relate to the contribution in terms of shade or protection from the elements.

### **Bifurcation**

Forked or divided into two or more parts or branches. Used to describe a union point.

### **Branch Bark Ridge**

Swelling of bark tissue on the upper side of the branch junction or union. Considered the normal pattern of development in contrast to included bark (from Matheny & Clark, 1994).

### **Branch collar**

Trunk tissue that forms around the base of a branch between the main stem and the branch. As the branch decreases in vigour or begins to die, the branch collar becomes more pronounced. (AS4373).

### **Structural Root Zone (SRZ)**

The Structural Root Zone (SRZ) is the calculated distance based on DBH only. The SRZ identifies the minimum radius at which the root plate cannot be disturbed. This measure only relates to the trees' stability and does not take into account the implications of a decline in health. The measurement is given in metres in a radius from the tree trunk. (Coder, 1996). This area may also be referred to as the Root Plate Radius (RPR).

### **Chlorotic**

Discolouration of the leaves, yellow in colour resulting from a lack of chlorophyll

### **Codominant**

Generally relates to trunks/ stems (although it may relate to scaffold branches within the crown) of two or more and of equal or similar size and relative importance (from Matheny & Clark, 1994).

### **Compartmentalisation**

Physiological process which creates the chemical and mechanical boundaries that act to limit the spread of disease and decay organisms (from Matheny & Clark, 1994).

### **Decay**

Degeneration and de-lignification of plant tissue, including wood, by pathogens or micro-organisms (AS4373).

### **Diameter at Breast Height (DBH)**

DBH is measured at 1.4m above ground level. In cases where the tree has up to three stems the diameter is calculated by taking the area of each stem at 1.4 metres and calculating the combined diameter. In trees with more than three stems the measurement is provided as 'Multi-stemmed', however in some cases the diameter will be taken at the point below the multi-stemmed union.

### **Epicormic Shoots**

Shoots which arise from adventitious or latent buds (usually dormant). They are generally produced in response to environmental stress.

### **Included Bark**

The pattern of development at a branch union where bark is turned inward rather than outward or pushed out. Relates to the branch bark ridge. (from Matheny & Clark, 1994)

### **Live Crown Ratio**

Relative proportion of healthy crown in proportion to overall tree height. Often not used in isolation due to the different natural forms of many species.

**Lateral**

A branch arising from another branch or stem (AS4373)

**Lopping**

Cutting back a limb or stem at any point with no regard to natural target pruning. Random cutting of branches or stems between branch unions or at internodes on young trees. Not considered an acceptable practice as part of the Australian Standard AS4373: *Pruning of Amenity Trees*.

**Tree Protection Zone (TPZ)**

The Tree Protection Zone (TPZ) (referenced from Australian Standard AS 4970 - 2009 - Protection of Trees on Development Sites; is the calculated distance based on the DBH of the tree. The TPZ addresses the physiological implications by retaining enough area around the tree not only to minimise the potential for complete tree failure but for the tree to survive in the landscape on a long-term basis. The measurement is given in metres in a radius from the centre of the trunk.

**Senescence**

The organic process of age and the deterioration of tissue within the tree.

**Stem bark ridge**

The ridge of bark that forms in the union between two codominant stems (AS4373).

**Wound wood**

Lignified, partially differentiated tissue which develops from the callus associated with wound or pruning cuts.

**Origin**

Origin is given as Indigenous (the trees' natural range is within the study area), Native (the trees natural range is within Australia) or Exotic (the tree originates from outside of Australia).

**Health**

Health relates to the tree vigour, live crown ratio and canopy density.

Health is rated according to the following categories:

<b>Category</b>	<b>Description</b>
Good	Crown is excurrent or decurrent with greater than 50% live crown ratio. Foliage density is greater than 70% at optimal growth. There is less than 10% canopy dieback present and foliage has no or very minor tip dieback. Tree may also have acceptable extension growth if it is in active growth and is showing no symptoms of nutrient deficiency. The tree also has good wound wood development.
Fair	Crown is excurrent or decurrent with 30-50% live crown ratio. Foliage density is between 50-70% at optimal growth for the species. There may be 10-30% canopy dieback present and foliage may have minor tip dieback. Tree maybe showing signs of normal growth but it is not consistent throughout the crown. Some foliage discolouration maybe present from possible nutrient deficiency or other cause.
Poor	The tree may have less than 30% live crown ratio and the canopy may be codominant or suppressed. There may be greater than 30% canopy dieback present and foliage density is below 50%. Stunted growth through leaf size or petiole extension and discolouration of the leaf may be present. Tree may be producing epicormic shoots as a stress response. Nutrient deficiency, lack of resources (water, light etc) or pathogens may be the causal agent in the tree's decline

## Significance

Site significance pertains to the significance of the individual tree to its surroundings. It should be noted that site significance applies only to the tree as it stands and does not allow for future development or decline. While a newly planted tree may be accorded a low rating it may well be essential to the future aesthetic qualities of its surroundings. Neither hazard nor appropriateness nor factors other than significance are taken into account. Significance does not relate to retention value.

Site significance is rated according to the following categories:

Category	Description
High	The tree may be of large size (height and/or spread) or located on neighbouring land. The tree may be of unusual and attractive form. The tree may be listed as a "Significant Tree" on one or more of several registers. The tree may flower abundantly or attractively. The tree may screen unattractive structures or landscape features. The tree may be part of a design that compliments the landscape. The tree contributes extensively to the landscape and may be worthy of extensive efforts of preservation.
Medium	The tree may be of medium or small size. The tree may be of somewhat unusual or attractive form. The tree may flower moderately. The tree may be isolated or part of a loosely defined planting. The tree may be part of a partially unsuccessful design or contribute moderately to the design. The tree contributes moderately to the landscape and dependant of the situation could be recommended for retention or removal.
Low	The tree may be of small size. The tree may be of nondescript form. The tree may have a poor floral display. The tree may be part of an unsuccessful design. The tree contributes little to the landscape and may be worthy of little attention or care.

## Retention Value

### High Retention Value

The tree is well suited to the site and offers significant amenity and/or screening values. The tree is typically in fair to good health with fair to good structure. The ULE rating is generally medium to long for the species. The tree may need to be retained for cultural/historic reasons. Indigenous, old or remnant vegetation is generally assessed as high retention value but may be downgraded due to hazardous structure or other health and safety concerns.

### High Retention Value (Third-party ownership)

The tree is located outside of the subject site. It may be owned by a private entity or public body. The tree has been assessed on the assumption that its owner requires the retention and successful incorporation of the tree. Negotiations with the relevant parties and authorities may result in the agreed removal.

### Medium Retention Value

The tree is generally of moderate amenity value. Proposed design should (where practical) accommodate tree retention. The tree may be high amenity value but be compromised due environmental conditions and/or hazardous structure or other health and safety concerns.

### Low Retention Value

The tree is generally of low amenity value. The tree may not be worth retaining in the landscape or may be easily replaced. The tree may be considered a weed species or structurally unsound. This category may contain trees that are young, juvenile, or semi-mature specimens that could be replaced with standard/advanced nursery stock with limited site amenity impacts.

## Structure

Structure relates to the physical form of the tree, including the trunk(s), main scaffold branches and roots. Structure includes the attributes that may influence the probability of major trunk, limb or root failure.

Structure is rated according to the following categories:

<b>Category</b>	<b>Description</b>
Good	The form of the tree is typical for the species and exhibits good symmetrical form. Major limbs are well formed with acceptable branch taper and unions appear to be strong with no signs of defects. The tree has minimal defects throughout the trunk and limbs. There is no sign of root plate heave or damage to the root system. The tree is unlikely to suffer branch or trunk failure under normal environmental conditions.
Fair	Tree has a fairly consistent form for the species. Tree may exhibit minor structural defects that may be managed through formative pruning. Only minor wounds are present that do not affect the overall stability or structural integrity of the tree. Minor root damage may have occurred in the past. Defects present are likely to cause only minor branch failure under normal environmental conditions.
Poor	Tree has a poorly formed crown that is not symmetrical. Branch and or trunk taper may be unacceptable and scaffold limbs may be overextended. Branch unions may exhibit significant defects that cannot be managed through formative pruning. Major root damage may have occurred and there may be evidence of root plate heave. Defects that are present may result in catastrophic failure of branches or trunk under normal environmental conditions.

## Age Class

The age class is given as a guide to the current live stage of the tree. Ultimately, the level of maturity that a tree may reach is dependent on the growing environment.

Age Class is rated according to the following categories

<b>Category</b>	<b>Description</b>
New Planting	Planted within approximately 2 years
Juvenile	Generally less than 5 years old
Young	Estimated as less than 15 years old
Semi-mature	Estimated at between 15 – 25 years old, however, this may be species dependant
Mature	Estimated at over 25 years old or in a life stage that is considered at the peak of growth for the species.
Senescent	In the declining phase of the tree's lifespan

## Useful Life Expectancy

**Long ULE:** Trees that appear to be retainable with an acceptable level of risk for more than 40 years.

- Structurally sound trees located in positions that can accommodate future growth.
- Storm damaged or defective trees that could be made suitable for retention in the long term by remedial tree surgery.
- Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

**Medium ULE:** Trees that appear to be retainable with an acceptable level of risk for 15-40 years.

- Trees that may only live between 15-40 years.
- Trees that may live for more than 40 years but would be removed to allow the safe development of more suitable individuals.
- Trees that may live for more than 40 years but would be removed during the course of normal management for safety and nuisance reasons.
- Storm damaged or defective trees that can be made suitable for retention in the medium term by remedial work.

**Short ULE:** Trees that appear to be retainable with an acceptable level of risk for 5-15 years.

- Trees that may live for 5-15 years.
- Trees that may live for more than 15 years but would be removed to allow the safe development of more suitable individuals.
- Trees that may live for more than 15 years but would be removed during the course of normal management for safety and nuisance reasons.
- Storm damaged or defective trees that can be made suitable for retention in the medium term by remedial work.

**Remove:** Trees with a high level of risk that would need removal within the next 5 years.

- Dead Trees.
- Dying or suppressed and declining trees through disease or inhospitable conditions.
- Dangerous trees through instability or recent loss of adjacent trees.
- Dangerous trees through structural defects including decay, included bark, wounds or poor form.
- Damaged trees that are considered unsafe to retain.
- Trees that will become dangerous after removal of other trees for the above reasons.

## APPENDIX G - TERMS AND CONDITIONS

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1. The author contracts with you on the basis that you promise that all legal information which you provide, including land title and ownership of other property, are correct. The author is not responsible for verifying or ascertaining any of these issues.
2. The author contracts with you on the basis that your promise that all affected property complies with all applicable statutes and legislation.
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  - (a) The information in this Report covers only those items which were examined and reflects the condition of those items at the time of the inspection only.
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