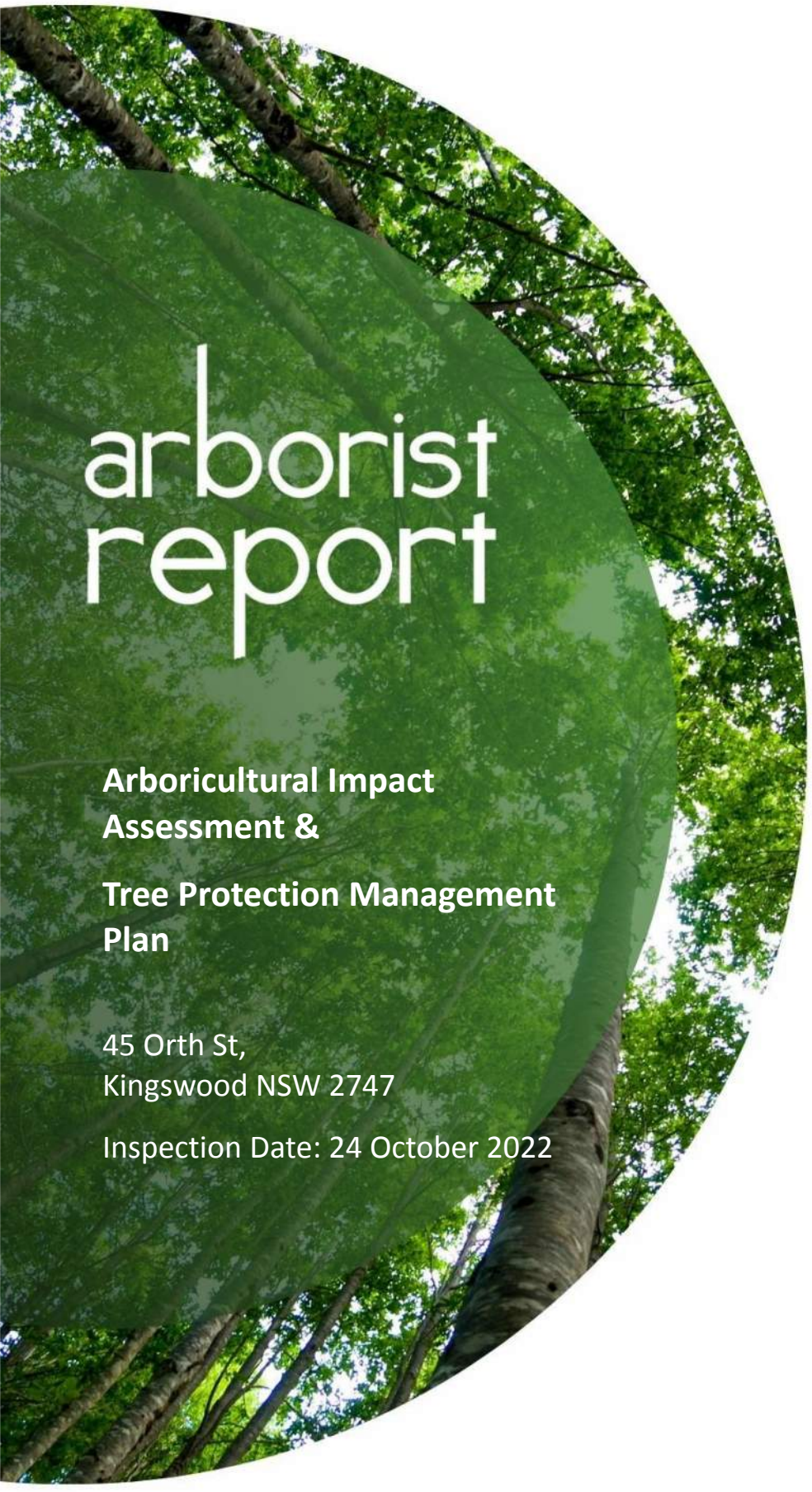

canopy consulting

arborist report

Arboricultural Impact Assessment &

Tree Protection Management Plan

45 Orth St,
Kingswood NSW 2747

Inspection Date: 24 October 2022

PREPARED FOR:

Jodie Ellis-Clark
45 Orth St,
Kingswood NSW 2747

Canopy Consulting
PO Box 902
Five Dock NSW 2046

Document Information

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Project Name:	**Axis Trust Medical Consulting Rooms Development**
Reference #:	**E-001663-22**
Client:	**Jodie Ellis-Clark**
Site:	**45 Orth St, Kingswood NSW 2747**
Prepared by:	**Kane Hollstein** Senior Consulting Arborist Dip. Arb., AQF Level 5 ISA TRAQ | QTRA | VALID | IACA Accredited Member
Contact Details:	**Canopy Consulting** Ph: 0432 633 402 E: info@canopyconsulting.com.au

Document Status

Status	Date	Revision type
Version 1	29 October 2023	
Version 2	23 April 2024	Updated based on revised plans

Report Assumptions and Limitations

1. Information provided by the client or third party is assumed to be accurate.
2. All information has been sourced with care and verified to the best of the consultant's knowledge. Any opinions not duly researched are based on the consultant's experience and observations.
3. The consultant is not required to give testimony or attend court unless under a contractual agreement, subject to payment of additional fees.
4. Modifying or removing any key contextual elements will invalidate the report.
5. The report does not guarantee that future problems or deficiencies associated with the site or vegetation will not arise.
6. The report addresses the items outlined in the project brief or examined during site inspection and reflects the condition of these items at the time of inspection.
7. The inspection is limited to ground-based inspection of accessible areas and does not include dissection, excavation, or probing unless specified.
8. The report is an impartial assessment of the tree(s) and its condition based on available evidence and projected outcomes.

Executive Summary

This report evaluates the potential arboricultural impacts of the proposed development at 45 Orth St Kingswood NSW 2747. The proposed works include demolition of existing structures and construction of new medical consulting rooms.

The report provides information on tree retention values, assesses project impacts, and offers recommendations for minimising negative impacts and preserving trees, where appropriate.

The report follows the Australian Standard AS4970-2009 *Protection of trees on development sites to* provide tree protection recommendations and uses the IACA Significance of a Tree Assessment Rating System (STARS)© to assess tree significance and allocate retention values.

The report also evaluates encroachments on Tree Protection Zones (TPZ) and Structural Root Zones (SRZ), with less than 10% TPZ encroachment considered minor, provided it is outside the SRZ, and greater than 10% or within the SRZ considered major.

Findings are summarised in Table 1.

Table 1: Impact Assessment Summary

		Tree ID and Retention Value			
Recommendation	**Tag/Tree QTY (Tree QTY)**	**High - Priority for Retention**	**Medium - Consider for Retention**	**Low - Consider for Removal**	**Priority for Removal**
Remove - project impacts	28 (29)		3, 5, 9, 15, 17, 18, 19, 20, 23, 25, 27 Tag QTY: (11) Tree QTY: (11)	1, 4, 6, 7, 8, 10, 11, 12, 13, 14, 16, 21, 22, 24, 26, 28 Tag QTY: (16) Tree QTY: (17)	2 Tag QTY: (1) Tree QTY: (1)
Remove - irrespective	0 (0)				
Retain - generic	1 (1)				29 Tag QTY: (1) Tree QTY: (1)
Retain - generic plus	0 (0)				
Total	**29 (30)**				

A total of 29 trees (28 tree numbers) have major TPZ and SRZ encroachments due to the proposed development. This includes 1 council street tree (Tree 24) whose removal will require agreement with Penrith council. These will occur due to either in isolation or conjunction with the following:

- Being within the hardstand and/or development footprint for driveways, crossover, retaining walls or building.
- Being subject to unsustainable cut and fill activities that cannot be mitigated.

Tree 29, a council street tree located on Orth St, is in very poor health due to an adjacent development that appears to have not installed tree protection. This tree is recommended for retention as it will not be significantly impacted by the development.

The proposed development will therefore see the removal of 29 trees (28 tree numbers) and retention of 1.

Table Of Contents

1. Background

1.1. Introduction

Jodie Ellis-Clark (the client) proposes to undertake demolition of existing structures and construction of new medical consulting rooms at 45 Orth St, Kingswood NSW 2747.

The client has engaged Canopy Consulting to investigate trees adjacent to the proposed works where they may be adversely affected by the project.

The purpose of this report is to:

- identify trees within the study area
- assign retention values of all trees that may be affected within the site and those on adjoining properties
- to assess the impacts of the project
- provide recommendations for alteration to design or construction methods where necessary to minimise negative impacts
- make recommendations in accordance with Australian Standard 4970–2009: *Protection of Trees on Development Sites* to ensure the viable, long-term retention of trees to be retained where appropriate

1.2. Site Details

Table 2: Site Details

Site Address	45 Orth St, Kingswood
Allotment Type	Commercial
Local Government Area (LGA)	Penrith City Council
Lot & DP No.	Lot 186 in DP14333
Zoning & Local Environment Plan (LEP)	MU 1 under the Penrith Local Environmental Plan 2010
Site Description	The subject site is a single allotment located on the corner of Orth St and Somerset St. ● The subject site exhibits an area of 727 sqm and is located in the suburb of Kingswood. ● The subject site affords a primary frontage of approximately 15m along Orth St (south) and 48m to Somerset St to the west. ● Vehicular access to the subject site is currently facilitated via existing access points on Somerset St.

1.3. Reviewed Plans and Documents

This report has relied on the following plans and documents:

Table 3: Reviewed Plans and Documents

Title	Author	Dwg. No.	Revision	Date
Plan of Detail, Levels & Contours Over Lot 186 In DP 14333 Known as No. 45 Orth Street, Kingswood	FREEBURN SURVEYING	N/A	0	12/09/2022
Cover Sheet	BELL Architecture	SK0001	P2	10/04/2024
3D Impressions - Sheet 1	BELL Architecture	SK0101	P2	10/04/2024
Existing Site and Demolition Plan	BELL Architecture	SK1001	P2	10/04/2024
Site Plan	BELL Architecture	SK1002	P2	10/04/2024
Landscape Plans	BELL Architecture	SK1003	P2	10/04/2024
Landscape Schedule	BELL Architecture	SK1004	P2	10/04/2024
Ground Level Floor Plans	BELL Architecture	SK2201	P2	10/04/2024
Level 1 Floor Plans and Roof Plan	BELL Architecture	SK2202	P2	10/04/2024
Elevations - Sheet 1	BELL Architecture	SK3101	P2	10/04/2024
Elevations - Sheet 2	BELL Architecture	SK3102	P2	10/04/2024
Overall Sections	BELL Architecture	SK4101	P2	10/04/2024
Shadow Diagrams	BELL Architecture	SK5101	P2	10/04/2024

1.4. Development/Project Description

The project area comprises the overall potential area of direct disturbance or impact by the project.

This may be temporary for construction or permanent for operational infrastructure and extend below the ground surface.

Note that proposed laydown areas have not been formally provided, and their impacts have not been assessed.

The proposal involves the construction and operation of a multi-unit warehouse and distribution facility at 45 Orth St, Kingswood, which includes:

- Demolition of all existing buildings and structures
- Site preparation works, including tree clearing
- Earthworks (to achieve an FFL of AHD 48000)
- Infrastructure comprising civil works and utilities servicing
- Two vehicular crossovers to Somerset St

- Construction of mixed use commercial space, split over two (2) storeys
- On-site car parking
- Complementary landscaping and offset planting

The layout of the proposal is shown in Figure 1.

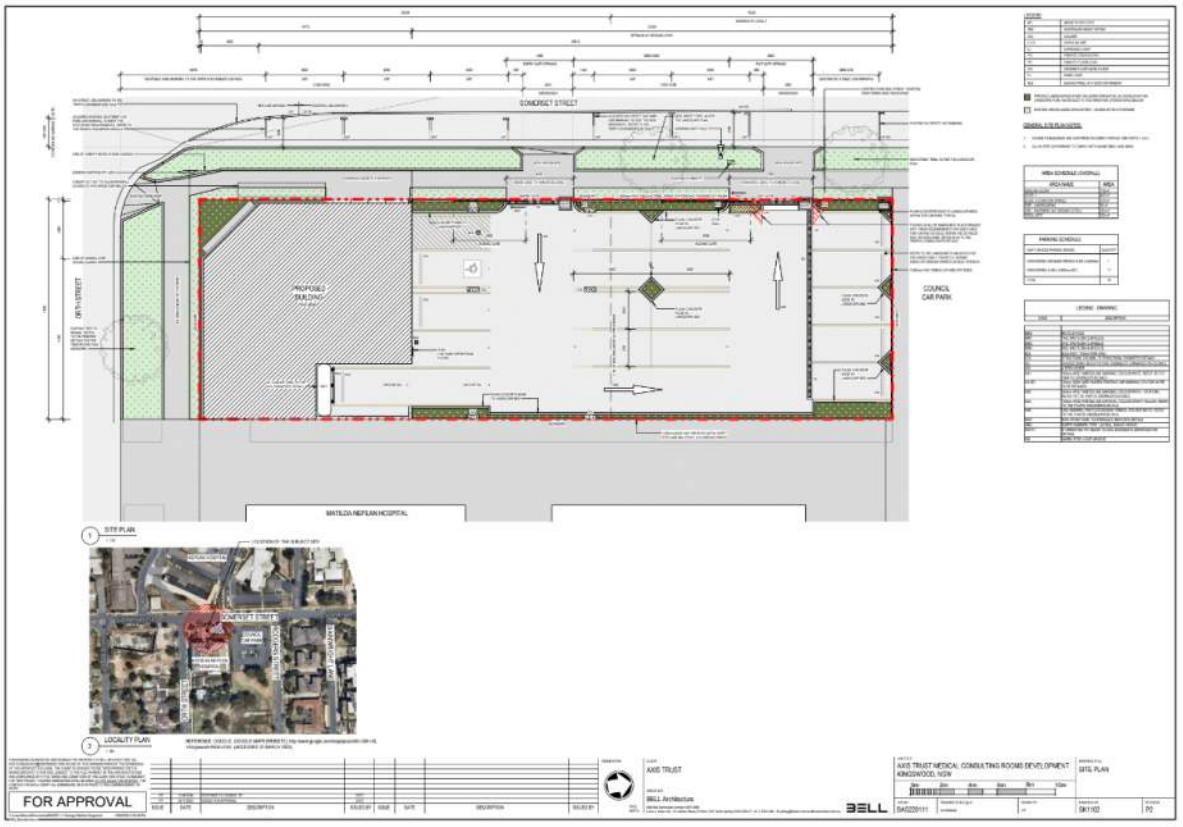

Figure 1: Proposed site layout. (Bell Architecture, 2024)

1.5. Legislative Context

The Commonwealth of Australia's Environmental Protection & Biodiversity Conservation Act 1999 (EPBC Act) manages nationally significant ecological communities and heritage items. The EPBC Act delegates to the NSW Biodiversity Conservation Act 2016 (BC Act) for state and local management of ecological and heritage matters. The BC Act, which repealed the NSW Threatened Species Conservation Act 1995, may require Species Impact Statement and Biodiversity Banking and Offset Scheme agreements determined by the Biodiversity Assessment Method (BAM)

In NSW, the Environmental Planning and Assessment Act 1979 (EP&A Act) regulates significant development and infrastructure through Environmental Planning Instruments (EPI), including State Environment Planning Policies (SEPP) for matters of state or regional significance and Local Environmental Plans (LEP) and Development Control Plans (DCP) for land usage guidance for local Councils.

1.6. Planning & Tree Management Controls

Table 4: Applicable Planning & Tree Management Controls

Local Environment Plan	Penrith Local Environmental Plan 2010 PLEP
Development Control Plan	Penrith Development Control Plan 2014 PDCP
Tree Management Controls	Prescribed trees within the Penrith City Council are protected under Part C2 of the PDCP made pursuant to Chapter 2 of the State Environmental Planning Policy (Biodiversity and Conservation) 2021 (the BCSEPP). The PDCP generally protects all trees and palms as 'declared vegetation' that meet the following: 1. Any indigenous tree (both living and dead) or other vegetation that is on land zoned E2 Environmental Conservation in the Penrith LEP 2010 Land Zoning Map or natural resources sensitive land identified in the Penrith LEP 2010 Natural Resources Sensitivity Land Map. 2. In residential areas, any tree or other vegetation having a height of 3m or more or a trunk exceeding 100mm Diameter at Breast Height (DBH, measured at approx. 1400mm above ground level). 3. In business and industrial areas: a. Any tree or other vegetation having a height of 3m or more or a trunk diameter exceeding 100mm DBH. 4. In rural areas: a. Any tree or other vegetation, within 20m of a dwelling house, having a height of 3m or more or a trunk exceeding 100mm DBH. b. Any indigenous tree or vegetation, not within 20m of a dwelling house. Note: clearing of vegetation will only be considered where it is proposed in conjunction with a use permissible on that land. c. Any introduction vegetation, not within 20m of a dwelling house, having a height of 3m or more or a trunk exceeding 100mm DBH. d. Any tree or other vegetation that is, or forms part of, a heritage item or is within a heritage conservation area.

Exemptions	1. a tree or other vegetation that the Council is satisfied is dying or dead and is not required as the habitat for native fauna; 2. a tree or other vegetation that the Council is satisfied is a risk or imminent threat to human life or property; 3. a tree or other vegetation where the trunk is located within 2m of an existing dwelling, as measured from the main trunk of the tree or other vegetation to an external enclosing wall of the existing dwelling; 4. controlled weeds under the NSW Biosecurity Act 2015 and identified in the Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022; 5. the removal of trees and other vegetation to maintain approved dams or bushfire asset protection zones. 6. Removal of identified exempt species.

1.7. Additional Legislative Protections

The following government planning overlays have been reviewed (SEED - NSW Government, 2023). Table 5 indicates the presence of the items on site.

Table 5: Mapping Overlays

NSW OEH	Present on Site	Relevance
Threatened Ecological Communities (TEC) Greater Sydney	☐	Not present on site. No relevance
State Heritage Register	☐	Not present on site. No relevance
Biodiversity Values	☐	Not present on site. No relevance
DCP/LEP		
Heritage	☐	Not present on site. No relevance
Terrestrial Biodiversity	☐	Not present on site. No relevance
Environmentally Sensitive Land	☐	Not present on site. No relevance
Other		
10/50 Vegetation Clearing Scheme	☐	Not present on site. No relevance

Figure 2 shows the site within the local area and associated planning overlays.

Figure 2: The subject site defined with a red polygon and associated planning overlays.

2. Scope

Assess the health and condition of trees on the site and neighbouring properties that may be affected by proposed works to determine tree retention values based on heritage, environmental and arboricultural principles.

Provide as an outcome of the assessment, the following:

- a description of the trees
- observations made
- retention values
- discussion of the effects the location of the proposed works may have on the trees
- make recommendations required for remedial or other works to the trees, if and where appropriate
- provide a description of the works or measures required to ameliorate the impact upon the trees to be retained; by the proposed building works or future impacts the trees may have upon the new building works if and where appropriate;
- or discuss the possible benefits of removal and replacement, if appropriate, for the medium to the long-term amenity of the site.

3. Method

3.1. Data Collection

To record the above-ground health and condition of each tree, a Visual Tree Assessment (VTA), adapted from (Lonsdale, 1999), was undertaken from ground level on 24 October 2022 by AQF Level 5 Consulting Arborist Liam Strachan.

This involved an inspection of

- Tree health and structural condition; both long and short term
- Site conditions
- Amenity value
- Heritage value
- Habitat value
- Environmental value

All diameter measurements were taken with a diameter tape or forestry callipers. All height and canopy spread values were estimated. Any offset measurements were measured with a tape measure.

Data was collected using GIS software linked to a Trimble Catalyst DA-2 GPS antenna with 1cm-2cm accuracy in optimal GPS conditions. Where trees were located on the survey plan, the locations were corrected using the following parameters:

- Locations were corrected to the dwg survey plan where present.
- Where absent from the survey, the GPS location was used. Using this method; locations may be +- 1m due to tree canopies and GPS interference.

Proposed plans were georeferenced to the survey plan and impacts were assessed in GIS software. Some discrepancies may exist between surveyed boundaries and those provided by the NSW cadastre.

3.2. Useful Life Expectancy

Estimated remaining Useful Life Expectancy (ULE) has been derived using a modified version of the TreeAZ SULE method (Barrell, 2009). An explanation of attributes required to achieve each category can be found in Appendix A.

3.3. Retention Value

The trees' significance rating and retention value were determined using the IACA Significance of a Tree Assessment Rating System (STARS)©. The rating was based on the Tree Significance - Assessment Criteria and the Retention Value - Priority Matrix, which considers landscape significance and estimated Useful Life Expectancy. Detailed explanations of the attributes used can be found in Appendix A.

3.4. Tree Protection Zone and Structural Root Zone

The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) methods have been derived from the Australian Standard 4970–2009: *Protection of Trees on Development Sites* (Standards Australia Limited, 2009). The radius of the TPZ is calculated for each tree by multiplying its Diameter at Breast Height (DBH) by 12.

$$\text{TPZ radius} = \text{DBH} \times 12$$

In the event the crown spread of the tree extends beyond this offset; the TPZ may be adjusted to the outer extent of the crown spread.

The SRZ is the area around the base of a tree required for the tree's stability in the ground. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.

$$\text{SRZ radius} = (D \times 50)^{0.42} \times 0.64$$

4. Observations

4.1. Site Soils

Site soils may deviate from their natural state due to past urban development. The site is located on the Luddenham Erosional soil landscape which is described as 'undulating to rolling low hills on Wianamatta Group shales, often associated with Minchinbury Sandstone. Local relief 50–80 m, slopes 5–20%. Narrow ridges, hillcrests and valleys. Extensively cleared tall open forest (wet sclerophyll forest).' (Department of Planning, Industry and Environment, 2020)

Soils of the Luddenham Erosional landscape are characterised by 'shallow (<100 cm) dark podzolic soils (Dd3.51) or massive earthy clays (Uf6.71) on crests; moderately deep (70–150 cm) red podzolic soils (Dr2.11, Dr2.41, Dr3.11) on upper slopes; moderately deep (<150 cm) yellow podzolic soils (Dy4.22) and prairie soils (Gn3.26) on lower slopes and drainage lines.' (Department of Planning, Industry and Environment, 2020)

Vegetation of this soil landscape is described as 'Extensively cleared open forest (dry sclerophyll forest). Dominant tree species include *Eucalyptus maculata* (spotted gum) and *E. moluccana* (grey box). Lesser occurrences of *E. fibrosa* (broad-leaved ironbark), *E. crebra* (narrow-leaved ironbark), *E. tereticornis* (forest red gum) and *E. longifolia* (woollybutt) occur. Understorey shrub species include *Bursaria spinosa* (blackthorn), *Breynia oblongifolia* (coffee bush), *Allocasuarina torulosa* (forest oak), *Acacia implexa* (hickory) and *Clerodendrum tomentosum* (hairy clerodendrum). Grasses are commonly *Aristida vagans* (speargrass), *Entolasia marginata* (bordered panic), *Eragrostis leptostachya* (paddock lovegrass) and *Themeda australis* (kangaroo grass) (Benson, 1981). Examples of natural vegetation can be found near Werombi and Floxton Park.' (Department of Planning, Industry and Environment, 2020)

4.2. Summary of Tree Observations

Complete tree attributes and observations can be found in Appendix B - Tree Assessment Schedule. A total of 30 trees were assessed under295 tree numbers. Where trees were similar in size, species, and location and were of lower significance in the landscape, they were grouped together.

Trees 24 and 29 are council street trees located on Somerset St and Orth St, respectively. The trees are *Lophostemon confertus* (Brush Box) that were in poor health.

No trees were observed to possess hollow bearing parts capable of supporting large fauna.

Photos and a subset of observations can be accessed using this link.

Table 6 summarises the mix of species and origin.

Table 6: Tree Species and Origin Summary

Species		Origin			
	No. of Trees or Groups (Tree QTY)	Dead or other	Exotic	Indigenous	Native
Agonis flexuosa	1 (2)				26 Tag QTY: (1) Tree QTY: (2)
Callistemon salignus	3 (3)				10, 11, 20 Tag QTY: (3) Tree QTY: (3)
Cupressus sempervirens	1 (1)		5 Tag QTY: (1) Tree QTY: (1)		
Eriobotrya japonica	1 (1)		21 Tag QTY: (1) Tree QTY: (1)		
Gordonia axillaris	1 (1)		4 Tag QTY: (1) Tree QTY: (1)		
Jacaranda mimosifolia	1 (1)		1 Tag QTY: (1) Tree QTY: (1)		
Lagerstroemia indica	1 (1)		27 Tag QTY: (1) Tree QTY: (1)		
Leptospermum petersonii	1 (1)				2 Tag QTY: (1) Tree QTY: (1)
Lophostemon confertus	2 (2)				24, 29 Tag QTY: (2) Tree QTY: (2)
Phoenix canariensis	1 (1)		22 Tag QTY: (1) Tree QTY: (1)		
Photinia robusta	6 (6)		6, 7, 8, 12, 13, 14 Tag QTY: (6) Tree QTY: (6)		
Pyrus calleryana	2 (2)		25, 28 Tag QTY: (2) Tree QTY: (2)		
Ulmus parvifolia	1 (1)		23 Tag QTY: (1) Tree QTY: (1)		
Xylosma japonica	7 (7)		3, 9, 15, 16, 17, 18, 19 Tag QTY: (7) Tree QTY: (7)		

Table 7 summarises the trees' legislated protection status under the PDCP. This assessment considers the size of the tree or exemption due to their species.

Table 7: Tree Legislated Protection Status

DCP Status	Tag/Tree QTY (Tree QTY)	Tree Numbers
Protected	29 (30)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29
Exempt	0 (0)	
N/A	0 (0)	
Total	**29 (30)**	

4.3. Tree Significance

Determined using the Tree Significance - Assessment Criteria of the IACA Significance of a Tree, Assessment Rating System (STARS)© (IACA, 2010); no trees were determined to possess a High Landscape Significance Rating due their location in the landscape.

Table 8: Landscape Significance Rating

Landscape Value	Tag/Tree QTY (Tree QTY)	Tree Numbers
1 (High)	0 (0)	
2 (Medium)	12 (12)	3, 5, 9, 15, 17, 18, 19, 20, 23, 24, 25, 27
3 (Low)	16 (17)	1, 4, 6, 7, 8, 10, 11, 12, 13, 14, 16, 21, 22, 26, 28, 29
4 (Environmental Pest / Noxious Weed)	0 (0)	
5 (Hazardous / Irreversible Decline)	1 (1)	2
Total	**29 (30)**	

4.4. Retention Value

Determined using the Retention Value - Priority Matrix of the *IACA Significance of a Tree, Assessment Rating System* (STARS) © (IACA, 2010), which is a matrix assessment of landscape significance and estimated Useful Life Expectancy. Tree retention values are summarised in Table 9.

Table 9: Retention Value

Retention Value	Tag/Tree QTY (Tree QTY)	Tree Numbers
High - Priority for Retention	0 (0)	
Medium - Consider for Retention	11 (11)	3, 5, 9, 15, 17, 18, 19, 20, 23, 25, 27
Low - Consider for Removal	16 (17)	1, 4, 6, 7, 8, 10, 11, 12, 13, 14, 16, 21, 22, 24, 26, 28
Priority for Removal	2 (2)	2, 29
Total	**29 (30)**	

Table 10: Retention Value Descriptions

Retention Value	Description and Relevance
High - Priority for Retention	These trees are considered important for retention and should be retained and protected. Design modification or re-location of buildings should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970-2009 *Protection of trees on development sites*. Tree-sensitive construction must be implemented, e.g. pier and beam, etc, if works are to proceed within the Tree Protection Zone.
Medium - Consider for Retention	These trees may be retained and protected. These are considered less critical; however, their retention should remain a priority, with removal only if adversely affecting the proposed building/works and all other alternatives have been exhausted.
Low - Consider for Removal	These trees are not important for retention, nor require special works or design modifications to be implemented for their retention.
Priority for Removal	These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

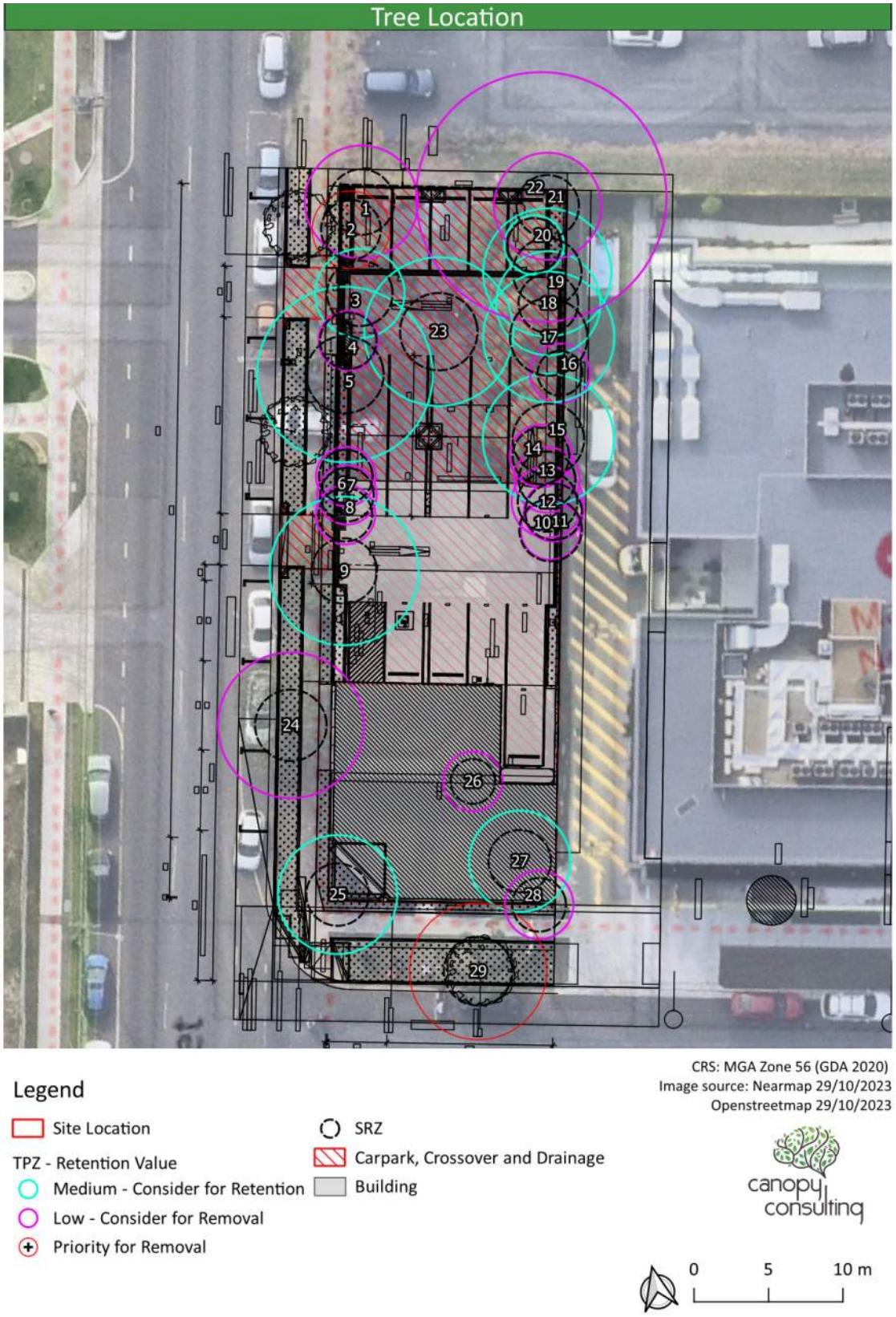

Figure 3: Map showing retention values, tree protection zones, structural root zones and overlaid plans.

5. Discussion

5.1. Tree Protection Zone (TPZ)

The Tree Protection Zone (TPZ) is a radial distance measured from the centre of the trunk. Application of the TPZ is intended to ensure the protection of the root system and canopy from potential damage incurred from construction works and ensure the long-term health, stability and landscape viability of each tree to be retained.

Incursions into the TPZ may occur due to excavation, modification of existing ground levels, trenching or inverting the soil profile. Such works may damage part or all of the root system or affect soil structure and growing conditions required for long-term growth.

5.2. Structural Root Zone (SRZ)

The Structural Root Zone (SRZ) is the area required for mechanical support and anchorage of a tree. The woody root growth and soil cohesion in this area are required to hold a tree upright.

Incursions into the SRZ are not recommended as they are likely to result in loss or damage to woody roots which may significantly affect stability. However, fully elevated, pier and beam type construction or hand-dug services are possible within the SRZ.

5.3. Acceptable Encroachments into the TPZ

An encroachment of less than 10% of the entire TPZ is considered minor provided it is outside the SRZ and the area lost is compensated for elsewhere and contiguous to the TPZ.

A major encroachment is considered to be greater than 10% of the entire TPZ area. Where unavoidable, exploratory excavation using non-destructive methods such as pneumatic, hydraulic or hand digging may be required to evaluate the extent of potential damage to the root system and determine whether the tree(s) will remain viable. The area lost to encroachment should be compensated for elsewhere and contiguous to the TPZ.

Additional encroachments within the TPZ are acceptable, provided the arborist can demonstrate the tree(s) will remain viable.

5.4. Impact Mitigation Measures

TPZ encroachments should be offset and mitigated using a range of possible measures to ensure impacts are minimised and, therefore, trees remain viable post construction. Mitigation measures should be increased relative to the level of encroachment within the TPZ.

AS 4970-2009 outlines the types of TPZ encroachment and mitigation measures required to ensure long-term viability, which are summarised in Table 11. These measures are only required if a tree is to be retained.

Table 11: Mitigation Measures

Encroachment Type	Mitigation Measures
Nil	• Where indirect or inadvertent encroachments may occur due to haul routes or machinery movement, tree protection should be installed.
Minor	• The area lost to encroachment must be offset elsewhere and contiguous to the TPZ. • Detailed root investigations should not be required. • Tree protection must be installed and maintained.
Major	• The Project Arborist must demonstrate the tree(s) will remain viable. • Root investigations using non-destructive methods may be required to clarify or confirm the impacts on trees to be retained. • The area lost to encroachment must be offset elsewhere and contiguous to the TPZ. • All works and excavations within the TPZ must be supervised by the Project Arborist. • Tree protection must be installed and maintained for the duration of the project. • Additional measures such as mulching or temporary irrigation may be required.

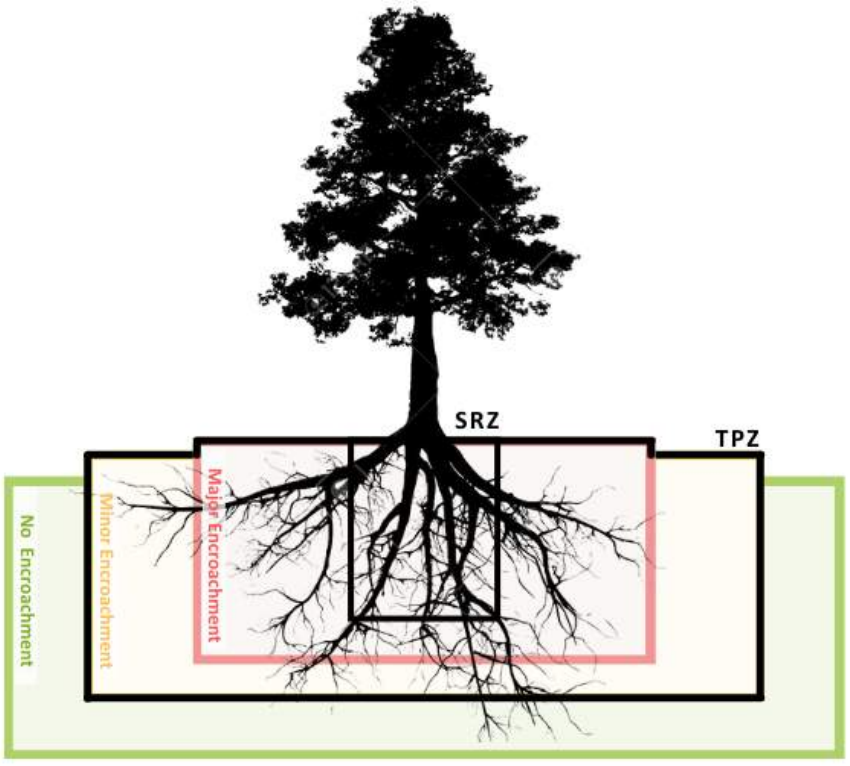

Figure 4: Indicative zones of TPZ and SRZ encroachment.

5.5. Impact Assessment

The following criteria have been considered to determine the impact on site trees that may occur due to the proposed development:

- Existing ground levels (R.L)
- Footprint of the proposed development, temporary structures, and laydown areas.
- Extent of the TPZ/SRZ
- Incursion into the TPZ, including any cut, fill, benching and shoring activities beyond the development footprint.
- Incursions to the tree canopy from the building or temporary structures (scaffolding)
- Existing site and soil conditions

The impacts of the proposed development are summarised in Table 12[1].

Table 12: Impact Assessment Summary

		Tree ID and Retention Value			
Recommendation	**Tag/Tree QTY (Tree QTY)**	**High - Priority for Retention**	**Medium - Consider for Retention**	**Low - Consider for Removal**	**Priority for Removal**
Remove - project impacts	28 (29)		3, 5, 9, 15, 17, 18, 19, 20, 23, 25, 27 Tag QTY: (11) Tree QTY: (11)	1, 4, 6, 7, 8, 10, 11, 12, 13, 14, 16, 21, 22, 24, 26, 28 Tag QTY: (16) Tree QTY: (17)	2 Tag QTY: (1) Tree QTY: (1)
Remove - irrespective	0 (0)				
Retain - generic	1 (1)				29 Tag QTY: (1) Tree QTY: (1)
Retain - generic plus	0 (0)				
Total	**29 (30)**				

[1] No tree protection measures may be recommended as the tree(s) are outside the expected area of construction.
Generic tree protection measures include tree protection fencing, trunk and/or branch protection and restriction of activities within the TPZ.
Genric plus protection measures include generic tree protection measures plus supervision of works within the TPZ and may include, in combination:

- The use of root sensitive construction techniques
- Design revision
- Routing services outside the TPZ
- Root mapping

A total of 29 trees (28 tree numbers) have major TPZ and SRZ encroachments due to the proposed development. This includes 1 council street tree (Tree 24) whose removal will require agreement with Penrith council. These will occur due to either in isolation or conjunction with the following:

- Being within the hardstand and/or development footprint for driveways, crossover, retaining walls or building.
- Being subject to unsustainable cut and fill activities that cannot be mitigated.

Tree 29, a council street tree located on Orth St, is in very poor health due to an adjacent development that appears to have not installed tree protection. This tree is recommended for retention as it will not be significantly impacted by the development.

The proposed development will therefore see the removal of 29 trees (28 tree numbers) and retention of 1.

Table 13: Impact Assessment Schedule

Tree no.	Retention Value	Encroachment into TPZ/SRZ	Encroachment Type	Likely Impact	Recommendation
1	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (48.71%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
2	Priority for Removal	TPZ encroachment for carpark, drainage and crossover (68.5%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
3	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (95.82%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
4	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (70.99%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
5	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (60.47%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
6	Low - Consider for Removal	TPZ encroachment for building footprint (30.28%), carpark, drainage and crossover (71.22%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
7	Low - Consider for Removal	TPZ encroachment for building footprint (58.14%), carpark, drainage and crossover (75.61%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
8	Low - Consider for Removal	TPZ encroachment for building footprint (72.41%), carpark, drainage and crossover (85.53%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
9	Medium - Consider for Retention	TPZ encroachment for building footprint (58.82%), carpark, drainage and crossover (75.27%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts

Tree no.	Retention Value	Encroachment into TPZ/SRZ	Encroachment Type	Likely Impact	Recommendation
10	Low - Consider for Removal	TPZ encroachment for building footprint (72.62%), carpark, drainage and crossover (72.3%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
11	Low - Consider for Removal	TPZ encroachment for building footprint (66.25%), carpark, drainage and crossover (66.81%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
12	Low - Consider for Removal	TPZ encroachment for building footprint (59.41%), carpark, drainage and crossover (74.64%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
13	Low - Consider for Removal	TPZ encroachment for building footprint (33.63%), carpark, drainage and crossover (78.08%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
14	Low - Consider for Removal	TPZ encroachment for building footprint (2.15%), carpark, drainage and crossover (90.11%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
15	Medium - Consider for Retention	TPZ encroachment for building footprint (7.32%), carpark, drainage and crossover (63.84%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
16	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (58.24%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
17	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (65.04%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
18	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (69.94%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts

Tree no.	Retention Value	Encroachment into TPZ/SRZ	Encroachment Type	Likely Impact	Recommendation
19	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (67.9%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
20	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (100.%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
21	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (48.99%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
22	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (33.65%)	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
23	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (100.%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
24	Low - Consider for Removal	TPZ encroachment for building footprint (16.52%), carpark, drainage and crossover (1.23%)	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ in addition to permanent infrastructure proposed. Tree in already reduced helath and will not tolerate additional construction impacts	Remove - project impacts
25	Medium - Consider for Retention	TPZ encroachment for building footprint (21.61%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
26	Low - Consider for Removal	TPZ encroachment for building footprint (100.%), carpark, drainage and crossover (1.06%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
27	Medium - Consider for Retention	TPZ encroachment for building footprint (87.7%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts

Tree no.	Retention Value	Encroachment into TPZ/SRZ	Encroachment Type	Likely Impact	Recommendation
28	Low - Consider for Removal	TPZ encroachment for building footprint (38.74%) which enters the SRZ	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
29	Priority for Removal	TPZ encroachment for building footprint (.04%)	Minor	Tree in very poor health due to no protection from adjacent construction.	Retain - generic

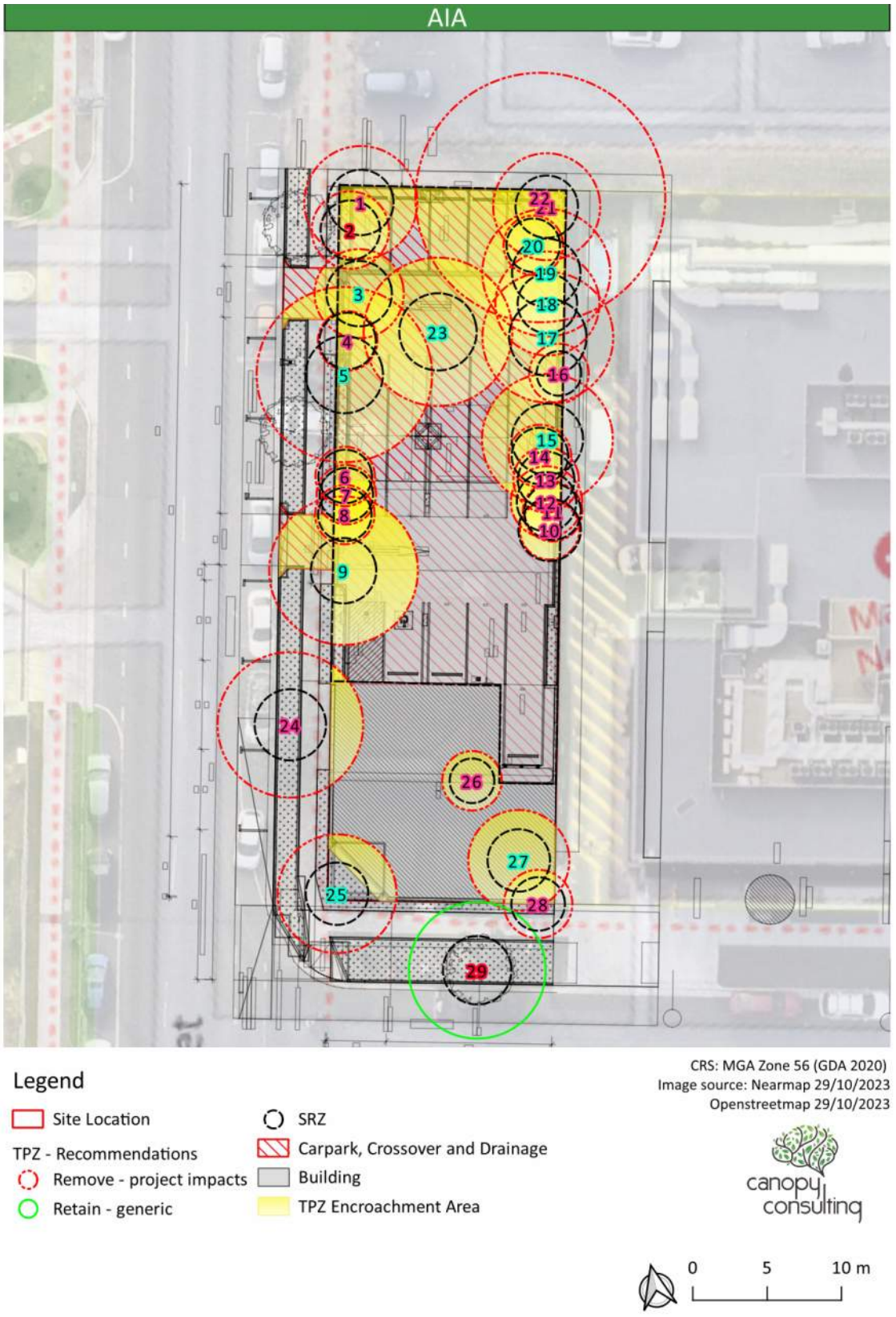

Figure 5: Impact Assessment

6. Recommendations

6.1. Project Arborist

An official "Project Arborist" must be commissioned to oversee the tree protection, and any works within the TPZs and complete regular monitoring compliance certification.

The project arborist must have a minimum of five (5) years of industry experience in arboriculture, horticulture with relevant demonstrated experience in tree management on construction sites, and Diploma level qualifications in arboriculture – AQF Level 5.

6.2. Tree Retention and Removal

The recommendations of this report do not constitute consent to remove trees subject to this report. The council or consent authority should be contacted prior to undertaking works as consent may be required to remove and/or prune the tree(s).

Table 14 summarises tree removal and retention and is shown in Appendix C - Tree Protection Management Plan. 29 trees grouped under 28 tree numbers require removal to facilitate the proposed development.

Table 14: Tree Retention and Removal

Recommendation	Tag/Tree QTY (Tree QTY)	Tree Numbers
Remove - project impacts	28 (29)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28
Remove - irrespective	0 (0)	
Retain - generic	1 (1)	29
Retain - generic plus	0 (0)	
Total	**29 (30)**	

Trees marked for removal are to be physically marked with paint prior to site establishment as per the approved TPMP. Before removal, the Project Arborist must confirm that all marked trees correspond with those shown in Appendix B - Tree Assessment Schedule and Appendix C – Tree Protection Management Plan.

Tree removal is to be carried out prior to the erection of protection fencing. Under no circumstances are trees marked for retention within protection areas to be damaged. Vehicles and heavy machinery used by contractors are also to be kept clear of these protection areas.

Stumps to be removed from within protection areas are to be removed in a manner that avoids damaging or disturbing roots of trees to be retained. This may include stump grinding or careful 'picking' of the stumps with machinery. Both methods are to be approved by the Project Arborist.

6.3. Offset Planting

Any tree approved to be removed from a site should be replaced with a tree of like habit and indigenous to the LGA where possible, planted as near as practicable to the location of the removed tree, grown to maturity and replaced if the planting fails to survive and thrive.

Trees should be sourced from a reputable nursery with stock grown to NATSPEC and Australian Standard AS 2303:2018 *Tree Stock for Landscape Use* criteria.

Trees should be a minimum of 100L pot size at the time of planting.

The trees should be planted and mulched with suitably composted, natural, hardwood mulch as per Figure 6.

Figure 6: Recommended tree planting process. (Arbor Day Foundation, 2020)

6.4. Generic Tree Protection

Generic tree protection measures are recommended to restrict construction activities within the TPZ which may adversely affect the health and condition of a tree to be retained. In order of precedence, the following is required for trees to be retained. Tree protection measures are to be installed and maintained as shown in Appendix C - Tree Protection Management Plan.

1. Install TPZ fencing and signage as per Appendix C - Tree Protection Management Plan. Where impractical and subject to project arborist approval;
1. Install trunk and ground protection where machine access is required.

Notes:

- All activities within the fenced TPZ are to be supervised by the project arborist.
- TPZ fencing is not to be moved.

6.5. Compliance and Certification Reporting – Hold Points

The following project milestones are recommended to be carried out by the project arborist. These inspections are summarised below and expanded upon in the following sections.

Table 15: Compliance and Certification Table

Construction Stage	Task	Responsibility	Certification	Timing of Inspection
Pre-construction	Indicate clearly (with spray paint or tape on trunks) trees approved for removal only	Principal Contractor	Project Arborist	Prior to site establishment
	Install tree protection measures			
	Induct construction staff into Tree Protection Management Plan			
During Construction	Supervise all excavation works proposed within the TPZ of trees to be retained			As required prior to the works proceeding adjacent to trees to be retained
	Inspection of trees by Project Arborist			Quarterly during construction period
Post-construction	Final Inspection of trees by Project Arborist			Following practical completion of works

7. Arboricultural Method Statement – Pre-Construction & Demolition

7.1. Site Establishment

The Project Arborist is to be provided a copy of the Construction Management Plan (CMP) to check for compliance with the TPMP. The CMP should ensure that site sheds, haul roads, laydown areas and sediment control are located outside the TPZ of trees to be retained.

At the completion of site establishment, the Project Arborist is to certify that tree protection measures comply with the TPMP.

7.2. Prohibited Activities within the TPZ

Activities generally excluded from the TPZ included but are not limited to-

a) Machine excavation including trenching;
b) Excavation for silt fencing;
c) cultivation;
d) storage;
e) preparation of chemicals, including preparation of cement products;
f) parking of vehicles and plant;
g) refuelling;
h) dumping of waste;
i) wash down and cleaning of equipment;
j) placement of fill;
k) lighting of fires;
l) soil level changes;
m) temporary or permanent installation of utilities and signs, and
n) physical damage to the tree.

7.3. Ground, Trunk and Branch Protection

Timber battens (50 mm x 100 mm x 2000mm or similar) must be placed around the trunk of tree 29 with battens spaced at 100 mm intervals and fixed against the trunk using metal or durable plastic strapping with connections appropriately finished or covered to protect pedestrians from snagging injury. The hessian and timber battens must not be fixed to the tree. Tree trunk and major branch protection are to remain in place for the duration of works and must be removed at the completion of the project.

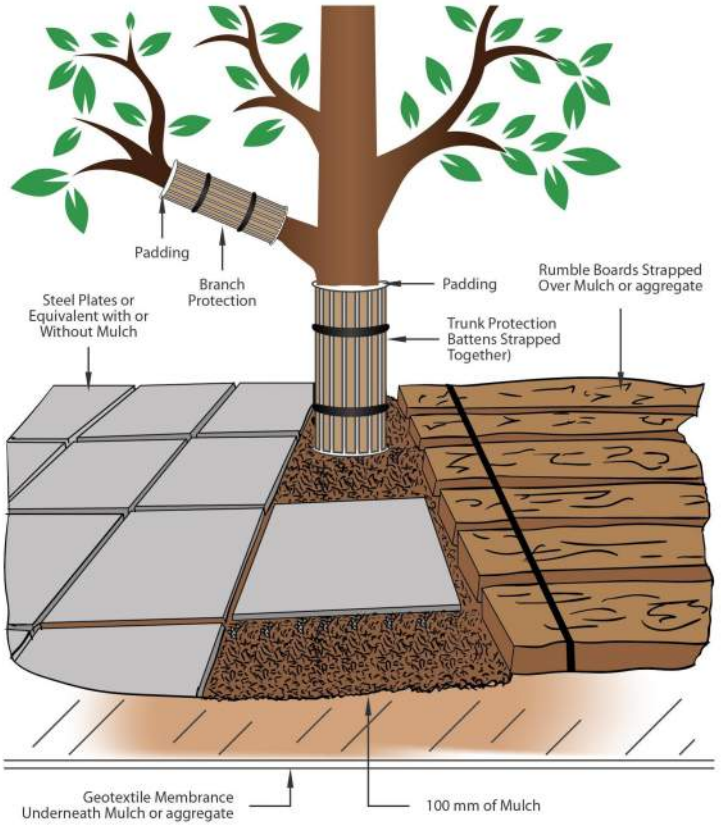

Figure 7: Details of trunk, branch and ground protection. (Standards Australia, 2009)

7.4. Scaffolding

Where scaffolding is required it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimised. This can be achieved by designing scaffolding to avoid branches or tying back branches. Where pruning is unavoidable it must be specified by the project arborist in accordance with AS 4373-2007 Pruning of Amenity Trees. NOTE: Pruning works will require approval by determining authority.

The ground below the scaffolding should be protected by boarding (e.g. scaffold board or plywood sheeting) as shown in Figure 8. Where access is required, a boardwalk or other surface material should be installed to minimise soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed.

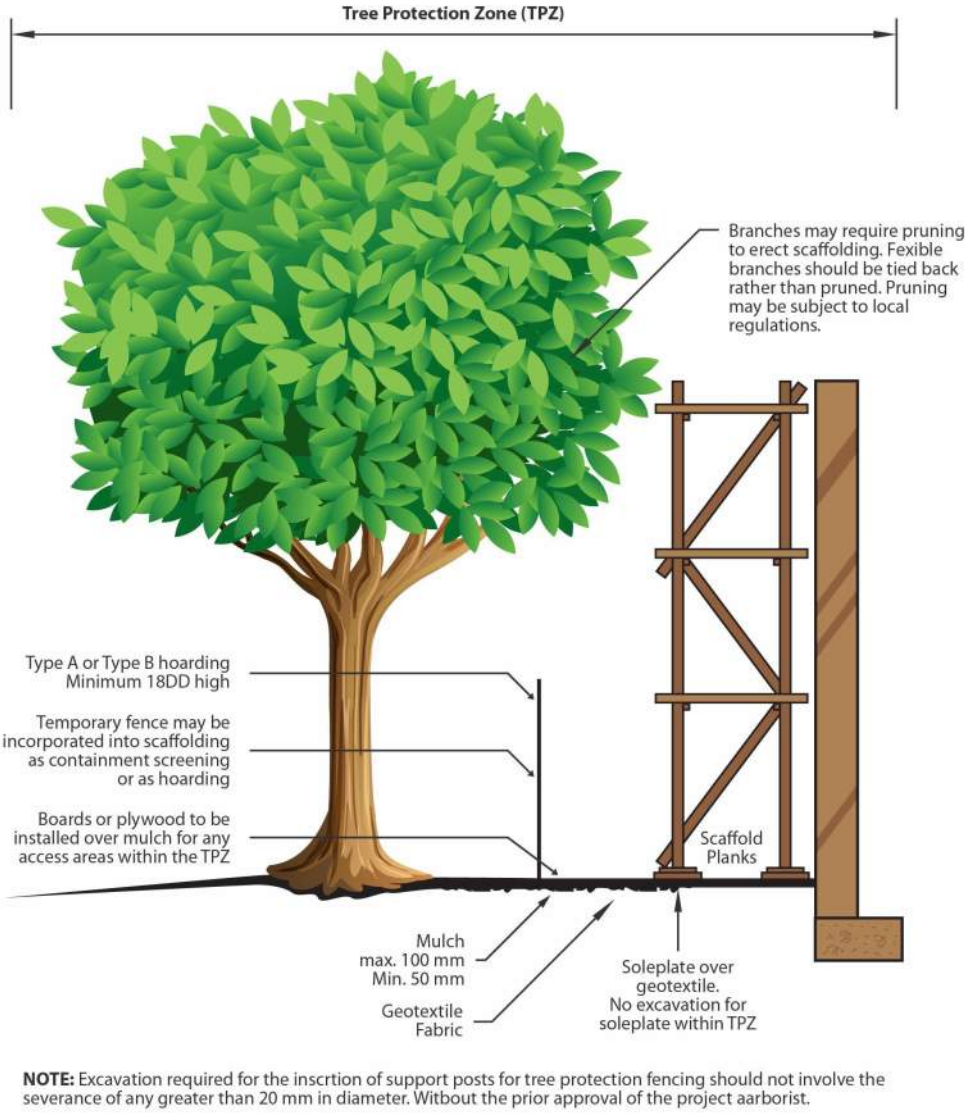

Figure 8: Details of scaffold installation. (Standards Australia, 2009)

8. Arboricultural Method Statement – Construction Stage

8.1. Excavations Within Tree Protection Zones

The Project Arborist is to monitor the impacts of demolition, bulk earthworks, and installation of temporary infrastructure including building, sediment control and drainage works.

Where the extent of encroachment is less than 10% of the TPZ, including any excavations for benching and shoring, excavation may be undertaken using conventional construction methods. 10% of the TPZ is equivalent to one-third of the TPZ radius on one side.

Where the encroachment is to be greater than 10% of the TPZ and prior to any mechanical excavations for building foundations, shoring, retaining wall or pavement subgrade within the TPZ of trees to be retained; exploratory excavation using non-destructive methodology shall be undertaken at the perimeter of the structure, excavation required for shoring, retaining wall or pavement subgrade within the TPZ.

Such techniques include:

- Excavation by hand
- Excavation using a high-pressure water jet and vacuum truck
- Excavation using an Air Spade with a vacuum truck.

The non-destructive excavation shall be undertaken at the outer limits of the structure to the depth of the foundation or excavation, or to a maximum of 800mm below existing surface levels. All care must be taken to prevent the damage or severance of roots greater than 50mm in diameter. Any roots encountered that are less than 50mm in diameter may be cleanly severed with a sharp pruning implement at the interface of the excavation nearest the tree. The exposed root zone is to be kept moist by way of geotextile or hessian placed along the open interface of the excavation nearest the tree.

Where roots greater than 50mm in diameter are encountered during exploratory excavation, advice from the Project Arborist shall be sought.

8.2. Tree Damage

Care is to be taken when operating cranes, piling rigs or similar near trees to avoid damage to tree canopies. Under no circumstances are branches to be torn off by construction equipment.

9. Arboricultural Method Statement – Post-construction

9.1. Defects Liability Period

Completion of outstanding building or landscaping works following the construction period must not injure trees.

9.2. Final Certification

The final inspection by the Project arborist should detail the health and condition of the trees and their growing environment and provide recommendations for any necessary remedial actions. These actions may include pruning in accordance with AS 4373-2007 *Pruning of amenity trees* and/or soil remediation to repair the growing environment.

On project completion, the project arborist shall certify in writing to the Certifying Authority that the conditions of consent relating to tree protection, tree removal, pruning and planting of new trees have been complied with or, if the conditions have been contravened, detail the extent and nature of the departure from the conditions and their impacts on trees.

10. References

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11. Appendix A - IACA Significance of a Tree, Assessment Rating System (STARS) ©

Tree Landscape Significance - Assessment Criteria

1. High Significance in landscape	2. Medium Significance in landscape	3. Low Significance in landscape
The tree is in good condition and good vigour; The tree has a form typical for the species; The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age; The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register; The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity; The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values; The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.	The tree is in fair-good condition and good or low vigour; The tree has form typical or atypical of the species; The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street, The tree provides a fair contribution to the visual character and amenity of the local area, The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.	The tree is in fair-poor condition and good or low vigour; The tree has form atypical of the species; The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings, The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area, The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen, The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions, The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms, The tree has a wound or defect that has potential to become structurally unsound. **Environmental Pest / Noxious Weed Species** The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties, The tree is a declared noxious weed by legislation. **Hazardous/Irreversible Decline** The tree is structurally unsound and/or unstable and is considered potentially dangerous, The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group. Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.

Estimated Life Expectancy

1. Long	2. Medium	3. Short	4. Remove
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.	Trees that appear to be retainable with an acceptable level of risk for 15-40 years. Trees that may only live between 15 and 40 more 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 or nuisance reasons. Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.	Trees that appear to be retainable with an acceptable level of risk for 5-15 years. Trees that may only live between 5 and 15 more 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 or nuisance reasons. Storm damaged or defective trees that require substantial remedial work to make safe and are only suitable for retention in the short term.	Trees with a high level of risk that would need removing within the next 5 years. Dead trees. Trees that should be removed within the next 5 years. Dying or suppressed or declining trees through disease or inhospitable conditions. Dangerous trees through instability or recent loss of adjacent trees. Dangerous trees through structural defects, including cavities, decay, included bark, wounds, or poor form. Damaged trees that are considered unsafe to retain. Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting. Trees that will become dangerous after removal of trees for other reasons.

Tree Retention Value – Priority Matrix

Estimated Life Expectancy	Landscape Significance Rating				
	1 (High)	2 (Medium)	3 (Low)	4 (Environmental Pest / Noxious Weed)	5 (Hazardous / Irreversible Decline)
Long (>40)	High - Priority for Retention	High - Priority for Retention	Medium - Consider for Retention	Low - Consider for Removal	Priority for Removal
Medium (15-40)	High - Priority for Retention	Medium - Consider for Retention	Medium - Consider for Retention / Low - Consider for Removal	Low - Consider for Removal	Priority for Removal
Short (5-15)	Low - Consider for Removal	Low - Consider for Removal	Low - Consider for Removal	Priority for Removal	Priority for Removal
Dead Or Hazardous (0-5)	Low - Consider for Removal	Priority for Removal	Priority for Removal	Priority for Removal	Priority for Removal

Legend for Matrix Assessment

High - Priority for Retention	These trees are considered important for retention and should be retained and protected. Design modification or re-location of buildings should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4979 *Protection of trees on development sites*. Tree-sensitive construction must be implemented, e.g. pier and beam, etc if works are to proceed within the Tree Protection Zone
Medium - Consider for Retention	These trees may be retained and protected. These are considered less critical; however, their retention should remain a priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered exhausted.
Low - Consider for Removal	These trees are not important for retention, nor require special works or design modification to be implemented for their retention.
Priority for Removal	These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

12. Appendix B - Tree Assessment Schedule

Tree no.	Botanical Name	Common Name	Trees in group	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	TPZ area (m2)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Vigour	Structural Condition	Age Class	ULE (Yrs.)	Observations	Comments	DCP Status	Origin	STARS Significance Rating	Retention Value	Encroachment into TPZ/SRZ	Within SRZ	Encroachment %	Encroachment Type	Likely Impact	Impact Assessment Recommendation
1	*Jacaranda mimosifolia*	Jacaranda	1	32	37	3.8	46.3	2.2	6	5	Fair	Poor	Semi-mature	Short (5-15)	Cavity, Co-dominant stems, Crack or split, Deadwood minor (<3cm diameter), Decay, Included bark, Suppressed, Weak attachments, Wound(s)		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (48.71%) which enters the SRZ	Y	48.71%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
2	*Leptospermum petersonii*	Lemon-scented Tea Tree	1	22.05	31	2.6	22.0	2.0	5	4	Very poor	Poor	Senescent	Dead Or Hazardous/Remove (0-5)	Broken Limb, Cavity, Co-dominant stems, Crack or split, Deadwood moderate (3-10cm diameter), Decay, Fungal fruiting body(s), Previous failure(s), Weak attachments, Wound(s)		Protected	Native	5 (Hazardous / Irreversible Decline)	Priority for Removal	TPZ encroachment for carpark, drainage and crossover (68.5%) which enters the SRZ	Y	68.50%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
3	*Xylosma japonica*	Xylosma	1	24.84	37	3.0	27.9	2.2	8	5	Good	Good	Mature	Medium (15-40)	Co-dominant stems, Crossing/rubbing branches, Deadwood major (>10cm diameter), Epicormic shoots, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (95.82%) which enters the SRZ	Y	95.82%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
4	*Gordonia axillaris*	Fried Egg Tree	1	15.62	27	2.0	12.6	1.9	6	4	Fair	Fair	Semi-mature	Short (5-15)	Co-dominant stems, Poor pruning, Wound(s)	Acca sellowiana	Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (70.99%) which enters the SRZ	Y	70.99%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
5	*Cupressus sempervirens*	Mediterranean Cypress	1	49.41	54	5.9	110.4	2.6	10	4	Good	Good	Mature	Medium (15-40)	Co-dominant stems, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (60.47%) which enters the SRZ	Y	60.47%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
6	*Photinia robusta*	Red Leaf Photinia	1	16.82	25	2.0	12.8	1.8	5	3	Fair	Poor	Semi-mature	Short (5-15)	Co-dominant stems, Poor pruning, Weak attachments, Wound(s)		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (30.28%), carpark, drainage and crossover (71.22%) which enters the SRZ	Y	71.22%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
7	*Photinia robusta*	Red Leaf Photinia	1	15.3	25	2.0	12.6	1.8	5	3	Fair	Poor	Semi-mature	Short (5-15)	Co-dominant stems, Poor pruning, Weak attachments, Wound(s)		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (58.14%), carpark, drainage and crossover (75.61%) which enters the SRZ	Y	75.61%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
8	*Photinia robusta*	Red Leaf Photinia	1	16.49	25	2.0	12.6	1.8	5	3	Fair	Poor	Semi-mature	Short (5-15)	Co-dominant stems, Poor pruning, Weak attachments, Wound(s)		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (72.41%), carpark, drainage and crossover (85.53%) which enters the SRZ	Y	85.53%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
9	*Xylosma japonica*	Xylosma	1	41.79	39	5.0	79.0	2.2	9	6	Good	Good	Semi-mature	Medium (15-40)	Co-dominant stems, Crossing/rubbing branches, Included bark, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for building footprint (58.82%), carpark, drainage and crossover (75.27%) which enters the SRZ	Y	75.27%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
10	*Callistemon salignus*	White Bottlebrush	1	16.64	33	2.0	12.6	2.1	8	3	Good	Fair	Semi-mature	Short (5-15)	Co-dominant stems, Crossing/rubbing branches, Included bark, Suppressed, Wound(s)		Protected	Native	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (72.62%), carpark, drainage and crossover (72.3%) which enters the SRZ	Y	72.62%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
11	*Callistemon salignus*	White Bottlebrush	1	14.32	27	2.0	12.6	1.9	8	3	Good	Fair	Semi-mature	Short (5-15)	Climbing vine, Co-dominant stems, Crossing/rubbing branches, Included bark, Suppressed, Wound(s)		Protected	Native	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (66.25%), carpark, drainage and crossover (66.81%) which enters the SRZ	Y	66.81%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
12	*Photinia robusta*	Red Leaf Photinia	1	20.05	30	2.4	18.2	2.0	7	5	Fair	Fair	Mature	Short (5-15)	Co-dominant stems, Crossing/rubbing branches, Suppressed		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (59.41%), carpark, drainage and crossover (74.64%) which enters the SRZ	Y	74.64%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
13	*Photinia robusta*	Red Leaf Photinia	1	18.06	28	2.2	14.8	1.9	7	5	Fair	Fair	Mature	Short (5-15)	Co-dominant stems, Crossing/rubbing branches, Suppressed		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (33.63%), carpark, drainage and crossover (78.08%) which enters the SRZ	Y	78.08%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
14	*Photinia robusta*	Red Leaf Photinia	1	17.55	28	2.1	13.9	1.9	7	5	Fair	Fair	Mature	Short (5-15)	Co-dominant stems, Crossing/rubbing branches, Suppressed		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (2.15%), carpark, drainage and crossover (90.11%) which enters the SRZ	Y	90.11%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
15	*Xylosma japonica*	Xylosma	1	37	45	4.4	61.9	2.4	10	7	Good	Good	Mature	Medium (15-40)	Co-dominant stems, Crossing/rubbing branches, Deadwood moderate (3-10cm diameter), Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for building footprint (7.32%), carpark, drainage and crossover (63.84%) which enters the SRZ	Y	63.84%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts

Tree no.	Botanical Name	Common Name	Trees in group	DBH Total (cm)	DRB (cm)	Radial TPZ (m)	TPZ area (m2)	Radial SRZ (m)	Tree Height (m)	Canopy (m)	Vigour	Structural Condition	Age Class	ULE (Yrs.)	Observations	Comments	DCP Status	Origin	STARS Significance Rating	Retention Value	Encroachment into TPZ/SRZ	Within SRZ	Encroachment %	Encroachment Type	Likely Impact	Impact Assessment Recommendation
16	*Xylosma japonica*	Xylosma	1	13	15	2.0	12.6	1.5	6	3	Fair	Fair	Juvenile	Short (5-15)	Inappropriate location, Wound(s)		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (58.24%) which enters the SRZ	Y	58.24%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
17	*Xylosma japonica*	Xylosma	1	36.78	54	4.4	61.2	2.6	13	8	Good	Fair	Mature	Medium (15-40)	Co-dominant stems, Crossing/rubbing branches, Deadwood moderate (3-10cm diameter), Included bark, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (65.04%) which enters the SRZ	Y	65.04%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
18	*Xylosma japonica*	Xylosma	1	29	31	3.5	38.0	2.0	13	8	Good	Fair	Mature	Medium (15-40)	Co-dominant stems, Crossing/rubbing branches, Deadwood moderate (3-10cm diameter), Included bark, Suppressed, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (69.94%) which enters the SRZ	Y	69.94%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
19	*Xylosma japonica*	Xylosma	1	35.85	41	4.3	58.1	2.3	13	8	Good	Fair	Mature	Medium (15-40)	Co-dominant stems, Crossing/rubbing branches, Deadwood moderate (3-10cm diameter), Included bark, Suppressed, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (67.9%) which enters the SRZ	Y	67.90%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
20	*Callistemon salignus*	White Bottlebrush	1	17	23	2.0	13.1	1.8	9	2	Fair	Good	Juvenile	Medium (15-40)	Suppressed, Wound(s)		Protected	Native	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (100.%) which enters the SRZ	Y	100.00%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
21	*Eriobotrya japonica*	Loquat	1	30	32	3.6	40.7	2.1	9	4	Poor	Poor	Mature	Short (5-15)	Broken Limb, Co-dominant stems, Crack or split, Deadwood major (>10cm diameter), Decay, Included bark, Poor pruning, Previous failure(s), Suppressed, Wound(s)		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (48.99%) which enters the SRZ	Y	48.99%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
22	*Phoenix canariensis*	Canary Island Date Palm	1	70	80	8.4	221.7	3.0	6	4	Fair	Fair	Semi-mature	Short (5-15)	Inappropriate location		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for carpark, drainage and crossover (33.65%)	N/A	33.65%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
23	*Ulmus parvifolia*	Chinese Elm	1	42	54	5.0	79.8	2.6	12	11	Good	Good	Semi-mature	Medium (15-40)	Co-dominant stems, Deadwood moderate (3-10cm diameter), Previous failure(s), Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for carpark, drainage and crossover (100.%) which enters the SRZ	Y	100.00%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
24	*Lophostemon confertus*	Brushbox	1	41	47	4.9	76.0	2.4	10	8	Poor	Poor	Semi-mature	Short (5-15)	Deadwood minor (<3cm diameter), Dieback, Wound(s)		Protected	Native	2 (Medium)	Low - Consider for Removal	TPZ encroachment for building footprint (16.52%), carpark, drainage and crossover (1.23%)	N	16.52%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ in addition to permanent infrastructure proposed. Tree in already reduced helath and will not tolerate additional construction impacts	Remove - project impacts
25	*Pyrus calleryana*	Callery Pear	1	33.56	34	4.0	51.0	2.1	7	8	Good	Good	Mature	Medium (15-40)	Co-dominant stems, Crossing/rubbing branches, Included bark, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for building footprint (21.61%) which enters the SRZ	Y	21.61%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
26	*Agonis flexuosa*	Willow Myrtle	2	10	12	2.0	12.6	1.5	5	4	Good	Fair	Young	Short (5-15)	Inappropriate location, Poor pruning, Weak attachments, Wound(s)		Protected	Native	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (100.%), carpark, drainage and crossover (1.06%) which enters the SRZ	Y	100.00%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
27	*Lagerstroemia indica*	Crepe Myrtle	1	27.93	35	3.4	35.3	2.1	6	4	Good	Fair	Mature	Medium (15-40)	Co-dominant stems, Constrained growing environment , Included bark, Poor pruning, Wound(s)		Protected	Exotic	2 (Medium)	Medium - Consider for Retention	TPZ encroachment for building footprint (87.7%) which enters the SRZ	Y	87.70%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
28	*Pyrus calleryana*	Callery Pear	1	19	24	2.3	16.3	1.8	6	3	Fair	Fair	Semi-mature	Short (5-15)	Constrained growing environment , Crossing/rubbing branches, Poor pruning, Weak attachments, Wound(s)		Protected	Exotic	3 (Low)	Low - Consider for Removal	TPZ encroachment for building footprint (38.74%) which enters the SRZ	Y	38.74%	Major	Tree not viable for retention due to significant demolition and earthworks within the TPZ and SRZ in addition to permanent infrastructure proposed.	Remove - project impacts
29	*Lophostemon confertus*	Brushbox	1	38	41	4.6	65.3	2.3	6	6	Very poor	Poor	Semi-mature	Dead Or Hazardous/Remove (0-5)	Plant pathogen, Poor pruning, Wound(s)	No tree protection zone established for neighbouring development site, machinery driven within TPZ	Protected	Native	3 (Low)	Priority for Removal	TPZ encroachment for building footprint (.04%)	N	0.04%	Minor	Tree in very poor health due to no protection from adjacent construction.	Retain - generic

13. Appendix C - Tree Protection Management Plan

JODIE ELLIS-CLARK - MEDICAL CONSULTING ROOMS

TREE PROTECTION MANAGEMENT PLAN

PREPARED BY	KANE HOLLSTEIN - AQF 5 CONSULTING ARBORIST
CLIENT	JODIE ELLIS-CLARK
SITE	Lot 186 in DP14333, KNOWN AS 45 ORTH ST, KINGSWOOD
SITE AREA	APPROX 727SQM
LGA	PENRITH CITY COUNCIL
NOTES	THE ARBORIST HAS RELIED ON INFORMATION SUPPLIED BY CLIENT AND OTHER CONSULTANTS AND CANNOT VERIFY THAT ALL INFORMATION IS TRUE AND CORRECT SCALING OF PLAN CANNOT ALWAYS BE RELIED UPON; THEREFORE, SITE MEASUREMENTS ARE ALWAYS ENDORSED. WHERE CONSTRUCTION DEVIATES FROM PLANS, THESE TREE PROTECTION MEASURES MUST BE RE-ASSESED PRIOR TO ANY WORKS TAKING PLACE

Tree Protection Zone and Structural Root Zone

The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) methods have been derived from the Australian Standard 4970–2009: *Protection of Trees on Development Sites* (Standards Australia Limited, 2009). The radius of the TPZ is calculated for each tree by multiplying its Diameter at Breast Height (DBH) by 12.

$$\text{TPZ radius} = \text{DBH} \times 12$$

In the event the crown spread of the tree extends beyond this offset; the TPZ may be adjusted to the outer extent of the crown spread.

The SRZ is the area around the base of a tree required for the tree's stability in the ground. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.

$$\text{SRZ radius} = (D \times 50)^{0.42} \times 0.64$$

Tree Protection Zone (TPZ)

The Tree Protection Zone (TPZ) is a radial distance measured from the centre of the trunk. Application of the TPZ is intended to ensure the protection of the root system and canopy from potential damage incurred from construction works and ensure the long-term health, stability and landscape viability of each tree to be retained.

Incursions into the TPZ may occur due to excavation, modification of existing ground levels, trenching or inverting the soil profile. Such works may damage part or all of the root system or affect soil structure and growing conditions required for long-term growth.

Structural Root Zone (SRZ)

The Structural Root Zone (SRZ) is the area required for mechanical support and anchorage of a tree. The woody root growth and soil cohesion in this area are required to hold a tree upright.

Incursions into the SRZ are not recommended as they are likely to result in loss or damage to woody roots which may significantly affect stability. However, fully elevated, pier and beam type construction or hand-dug services are possible within the SRZ.

Acceptable Encroachments into the TPZ

An encroachment of less than 10% of the entire TPZ is considered minor provided it is outside the SRZ and the area lost is compensated for elsewhere and contiguous to the TPZ.

A major encroachment is considered to be greater than 10% of the entire TPZ area. Where unavoidable, exploratory excavation using non-destructive methods such as pneumatic, hydraulic or hand digging may be required to evaluate the extent of potential damage to the root system and determine whether the tree(s) will remain viable. The area lost to encroachment should be compensated for elsewhere and contiguous to the TPZ.

Additional encroachments within the TPZ are acceptable, provided the arborist can demonstrate the tree(s) will remain viable.

Impact Mitigation Measures

TPZ encroachments should be offset and mitigated using a range of possible measures to ensure impacts are minimised and, therefore, trees remain viable post construction. Mitigation measures should be increased relative to the level of encroachment within the TPZ.

AS 4970-2009 outlines the types of TPZ encroachment and mitigation measures required to ensure long-term viability, which are summarised in Table 1. These measures are only required if a tree is to be retained.

LOCALITY MAP

Table 1: Mitigation Measures

Encroachment Type	Mitigation Measures
Nil	• Where indirect or inadvertent encroachments may occur due to haul routes or machinery movement, tree protection should be installed.
Minor	• The area lost to encroachment must be offset elsewhere and contiguous to the TPZ. • Detailed root investigations should not be required. • Tree protection must be installed and maintained.
Major	• The Project Arborist must demonstrate the tree(s) will remain viable. • Root investigations using non-destructive methods may be required to clarify or confirm the impacts on trees to be retained. • The area lost to encroachment must be offset elsewhere and contiguous to the TPZ. • All works and excavations within the TPZ must be supervised by the Project Arborist. • Tree protection must be installed and maintained for the duration of the project. • Additional measures such as mulching or temporary irrigation may be required.

JODIE ELLIS-CLARK - MEDICAL CONSULTING ROOMS

GENERAL

PROJECT ARBORIST

AN OFFICIAL “PROJECT ARBORIST” MUST BE COMMISSIONED TO OVERSEE THE TREE PROTECTION, ANY WORKS WITHIN THE TPZ’S AND COMPLETE REGULAR MONITORING COMPLIANCE CERTIFICATION.
THE PROJECT ARBORIST MUST HAVE MINIMUM FIVE (5) YEARS INDUSTRY EXPERIENCE IN THE FIELD OF ARBORICULTURE, HORTICULTURE WITH RELEVANT DEMONSTRATED EXPERIENCE IN TREE MANAGEMENT ON CONSTRUCTION SITES, AND DIPLOMA LEVEL QUALIFICATIONS IN ARBORICULTURE – AQF LEVEL 5.

COMPLIANCE INSPECTION AND REPORTING

COMPLIANCE INSPECTIONS ARE RECOMMENDED TO BE COMPLETED ON A QUARTERLY BASIS THROUGH THE CONSTRUCTION STAGE.
FOLLOWING EACH INSPECTION, THE PROJECT ARBORIST SHALL PREPARE A DOCUMENT DETAILING THE CONDITION OF THE TREES TO THE PROJECT MANAGER WITHIN 48 HOURS OF EACH INSPECTION. THESE DOCUMENTS MUST CERTIFY WHETHER THE WORKS HAVE BEEN COMPLETED IN COMPLIANCE WITH THE APPROVED CONSENT CONDITIONS RELATING TO TREE PROTECTION. THESE REPORTS MUST CONTAIN PHOTOGRAPHIC EVIDENCE WHERE NECESSARY.
INSPECTIONS ARE TO BE CONDUCTED BY THE PROJECT ARBORIST AT SEVERAL KEY POINTS DURING THE CONSTRUCTION IN ORDER TO ENSURE THAT PROTECTION MEASURES ARE BEING ADHERED TO DURING CONSTRUCTION STAGES AND DECLINE IN TREE HEALTH OR ADDITIONAL REMEDIATION MEASURES CAN BE IDENTIFIED.THESE HAVE BEEN IDENTIFIED AS INDIVIDUAL HOLD POINTS FOR EACH CONSTRUCTION STAGE AND INDICATED IN THE PLAN DRAWING.
ANY WORKS WITHIN TREE PROTECTION ZONES ARE TO BE MONITORED AND SUPERVISED BY THE PROJECT ARBORIST.

REV	DESCRIPTION	DATE
A	FOR DA SUBMISSION	29/10/2023

NOTES:

TREES APPROVED FOR REMOVAL ARE TO BE MARKED BY THE PROJECT ARBORIST PRIOR TO THEIR REMOVAL.
TREE REMOVAL IS TO BE CARRIED OUT PRIOR TO THE ERECTION OF PROTECTION FENCING. UNDER NO CIRCUMSTANCES ARE TREES MARKED FOR RETENTION WITHIN PROTECTION AREAS TO BE DAMAGED. VEHICLES AND HEAVY MACHINERY USED BY TREE CONTRACTORS ARE ALSO TO BE KEPT CLEAR OF THESE PROTECTION AREAS. STUMPS TO BE REMOVED FROM WITHIN PROTECTION AREAS ARE TO BE REMOVED IN A MANNER THAT AVOIDS DAMAGING OR DISTURBING ROOTS OF TREES TO BE RETAINED. THIS MAY INCLUDE STUMP GRINDING OR CAREFUL 'PICKING' OF THE STUMPS WITH MACHINERY. BOTH METHODS ARE TO BE APPROVED BY THE PROJECT ARBORIST.

ALL TREES ARE TO BE REMOVED IN ACCORDANCE WITH THE CODE OF PRACTICE , AMENITY TREE INDUSTRY 1998, WORKCOVER NSW.

LEGEND

TPZ - Recommendations

Remove - project impacts

HOLD POINTS

PROJECT ARBORIST TO INDICATE CLEARLY (WITH SPRAY PAINT OR TAPE ON TRUNKS) TREES APPROVED FOR REMOVAL ONLY

DRAWN: KH
DWG NO: TRP.01
SCALE: 1:200@A3

2.5 0 2.5 5 m

PROJECT:
PROPOSED MEDICAL CONSULTING ROOMS

DWG:
TREE REMOVAL PLAN

CLIENT: JODIE ELLIS-CLARK
SITE: 45 ORTH ST, KINGSWOOD NSW 2747

PO Box 902
Five Dock NSW 2046
E: info@canopyconsulting.com.au
P: 1300 1 CANOPY

canopy consulting

TreeId	Botanical Name	Common Name	Radial TPZ (m)	Radial SRZ (m)	Impact Assessment Recommendation
1	Jacaranda mimosifolia	Jacaranda	3.8	2.2	Remove - project impacts
2	Leptospermum petersonii	Lemon-scented Tea Tree	2.6	2.0	Remove - project impacts
3	Xylosma japonica	Xylosma	3.0	2.2	Remove - project impacts
4	Gordonia axillaris	Fried Egg Tree	2.0	1.9	Remove - project impacts
5	Cupressus sempervirens	Mediterranean Cypress	5.9	2.6	Remove - project impacts
6	Photinia robusta	Red Leaf Photinia	2.0	1.8	Remove - project impacts
7	Photinia robusta	Red Leaf Photinia	2.0	1.8	Remove - project impacts
8	Photinia robusta	Red Leaf Photinia	2.0	1.8	Remove - project impacts
9	Xylosma japonica	Xylosma	5.0	2.2	Remove - project impacts
10	Callistemon salignus	White Bottlebrush	2.0	2.1	Remove - project impacts
11	Callistemon salignus	White Bottlebrush	2.0	1.9	Remove - project impacts
12	Photinia robusta	Red Leaf Photinia	2.4	2.0	Remove - project impacts
13	Photinia robusta	Red Leaf Photinia	2.2	1.9	Remove - project impacts
14	Photinia robusta	Red Leaf Photinia	2.1	1.9	Remove - project impacts
15	Xylosma japonica	Xylosma	4.4	2.4	Remove - project impacts
16	Xylosma japonica	Xylosma	2.0	1.5	Remove - project impacts
17	Xylosma japonica	Xylosma	4.4	2.6	Remove - project impacts
18	Xylosma japonica	Xylosma	3.5	2.0	Remove - project impacts
19	Xylosma japonica	Xylosma	4.3	2.3	Remove - project impacts
20	Callistemon salignus	White Bottlebrush	2.0	1.8	Remove - project impacts
21	Eriobotrya japonica	Loquat	3.6	2.1	Remove - project impacts
22	Phoenix canariensis	Canary Island Date Palm	8.4	3.0	Remove - project impacts
23	Ulmus parvifolia	Chinese Elm	5.0	2.6	Remove - project impacts
24	Lophostemon confertus	Brushbox	4.9	2.4	Remove - project impacts
25	Pyrus calleryana	Callery Pear	4.0	2.1	Remove - project impacts
26	Agonis flexuosa	Willow Myrtle	2.0	1.5	Remove - project impacts
27	Lagerstroemia indica	Crepe Myrtle	3.4	2.1	Remove - project impacts
28	Pyrus calleryana	Callery Pear	2.3	1.8	Remove - project impacts
29	Lophostemon confertus	Brushbox	4.6	2.3	Retain - generic

RECOMMENDATION DEFINITIONS

NAME	DEFINITION
GENERIC PROTECTION MEASURES	Generic tree protection measures include tree protection fencing, trunk and/or branch protection and restriction of activities within the TPZ.

REV	DESCRIPTION	DATE
A	FOR DA SUBMISSION	29/10/2023

NOTES:

TREES MAY NOT BE APPROVED FOR REMOVAL AND MUST BE CONFIRMED PRIOR TO UNDERTAKING ANY TREE WORKS.

THIS DOCUMENT IS NOT CONSENT TO REMOVE OR PRUNE TREES

DRAWN: KH
DWG NO: TS.01
SCALE:

PROJECT:
PROPOSED MEDICAL CONSULTING ROOMS

DWG:
TREE SCHEDULE

CLIENT: JODIE ELLIS-CLARK
SITE: 45 ORTH ST, KINGSWOOD NSW 2747

PO Box 902
Five Dock NSW 2046
E: info@canopyconsulting.com.au
P: 1300 1 CANOPY

canopy consulting

THE FOLLOWING SPECIFIC ACTIONS MUST BE UNDERTAKEN IN CHRONOLOGICAL ORDER. THESE ACTIONS MUST BE ADHERED TO AT ALL TIMES AND
THE PROJECT ARBORIST MUST ENSURE THAT ALL ACTIONS HAVE BEEN UNDERTAKEN TO ENSURE COMPLIANCE WITH THE TREE PROTECTION MANAGEMENT PLAN (TPMP)

1. SITE ESTABLISHMENT AND INDUCTION

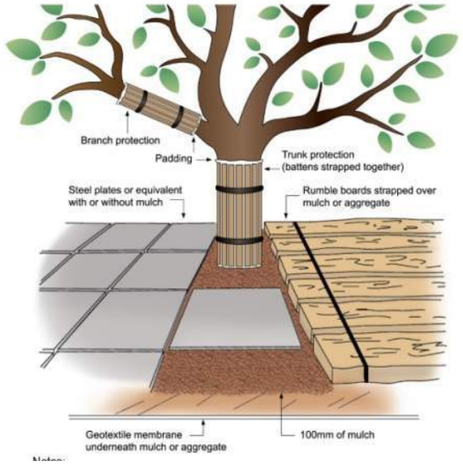
A SITE INDUCTION MEETING WITH THE BUILDER, DEMOLITION CONTRACTORS, AND PROJECT ARBORIST IS TO BE SCHEDULED PRIOR TO DEMOLITION TO IDENTIFY TREES COVERED BY THE TPMP. A COPY OF THE TPMP IS TO BE DISTRIBUTED TO ALL PARTIES AND INCLUDE IT IN THE PROJECT'S CONTRACT DOCUMENTS.
THE PROJECT ARBORIST IS TO BE PROVIDED A COPY OF THE CONSTRUCTION MANAGEMENT PLAN (CMP) TO CHECK FOR COMPLIANCE WITH THE TPMP. THE CMP SHOULD ENSURE THAT SITE SHEDS, HAUL ROADS, LAYDOWN AREAS AND SEDIMENT CONTROL ARE LOCATED OUTSIDE THE TPZ OF TREES TO BE RETAINED.
AT THE COMPLETION OF SITE ESTABLISHMENT, THE PROJECT ARBORIST IS TO CERTIFY THAT TREE PROTECTION MEASURES COMPLY WITH THE TPMP.

2. PROHIBITED ACTIVITIES WITHIN THE TPZ

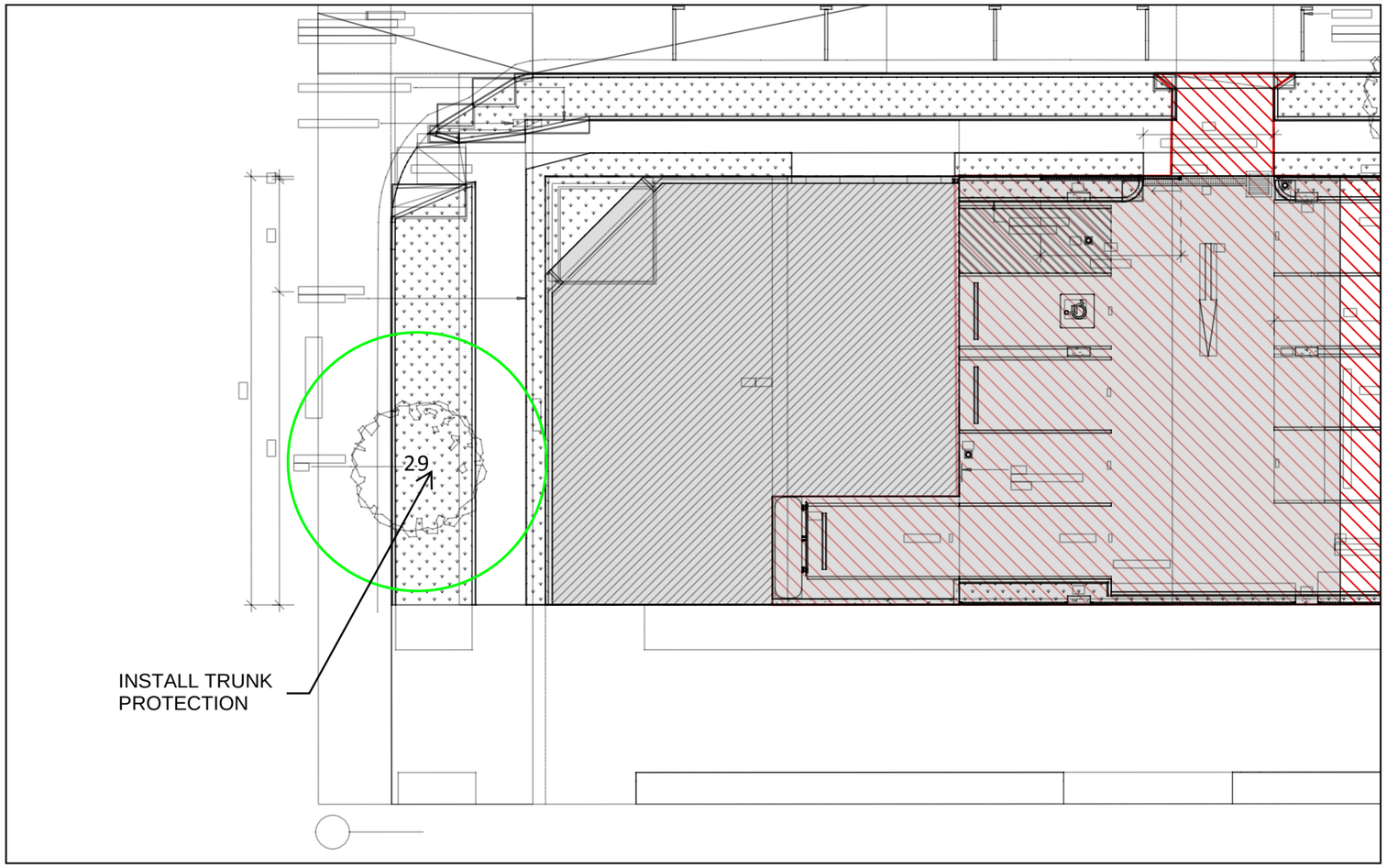
ACTIVITIES GENERALLY EXCLUDED FROM THE TPZ INCLUDED BUT ARE NOT LIMITED TO-
MACHINE EXCAVATION INCLUDING TRENCHING;
EXCAVATION FOR SILT FENCING;
CULTIVATION;
STORAGE;
PREPARATION OF CHEMICALS, INCLUDING PREPARATION OF CEMENT PRODUCTS;
PARKING OF VEHICLES AND PLANT;
REFUELLING;
DUMPING OF WASTE;
WASH DOWN AND CLEANING OF EQUIPMENT;
PLACEMENT OF FILL;
LIGHTING OF FIRES;
SOIL LEVEL CHANGES;
TEMPORARY OR PERMANENT INSTALLATION OF UTILITIES AND SIGNS, AND PHYSICAL DAMAGE TO THE TREE.

3. TRUNK & GROUND PROTECTION

CONSTRUCTION ROUTES FOR APPROVED EQUIPMENT SHALL BE CONFINED TO EXISTING HARD-SURFACED AREAS WHEREVER POSSIBLE TO MINIMISE COMPACTION AND DISTURBANCE OF THE UNDERLYING SOIL PROFILE AND ROOT ZONE. WHERE CONSTRUCTION ACCESS INTO THE TPZ OF RETAINED TREES CANNOT BE AVOIDED, THE ROOT ZONE OF EACH TREE MUST BE PROTECTED BY PLACING WEIGHT DISTRIBUTION MATS / TRACK MATS UNTIL SUCH A TIME AS THE PERMANENT ABOVE-GROUND SURFACING IS INSTALLED. EXPOSED SURFACE ROOTS SHALL FIRST BE COVERED IN A LAYER OF MULCH AT A MINIMUM THICKNESS OF 75-100 MM BEFORE PLACING DOWN WEIGHT DISTRIBUTION MATS / TRACK MATS; ROOT BUTTRESSES WHICH ARE EXPOSED SHALL HAVE TREE PROTECTION EXTENDED DOWNWARD FROM THE TRUNK TO PREVENT TREE INJURY.
TRUNK PROTECTION IS TO BE INSTALLED AS INDICATED IN THE TPMP PLAN. WHERE SPECIFIED, TREE TRUNK/S AND/OR MAJOR BRANCHES LOCATED WITHIN CLOSE PROXIMITY TO WORKS, MUST BE WRAPPED WITH PROTECTIVE HESSIAN OR SIMILAR ACCEPTABLE MATERIAL TO PREVENT TREE INJURY. MAJOR BRANCHES WOULD TYPICALLY BE CONSIDERED TO BE OF A DIAMETER GREATER THAN 100MM DIAMETER.
TIMBER BATTENS (50 MM X 100 MM X 2000MM OR SIMILAR) MUST BE PLACED AROUND TREE TRUNKS WITH BATTENS SPACED AT 100 MM INTERVALS AND FIXED AGAINST THE TRUNK USING METAL OR DURABLE PLASTIC STRAPPING WITH CONNECTIONS APPROPRIATELY FINISHED OR COVERED TO PROTECT PEDESTRIANS FROM SNAGGING INJURY. THE HESSIAN AND TIMBER BATTENS MUST NOT BE FIXED TO THE TREE. TREE TRUNK AND MAJOR BRANCH PROTECTION ARE TO REMAIN IN PLACE FOR THE DURATION OF WORKS AND MUST BE REMOVED AT THE COMPLETION OF THE PROJECT.



TRUNK & GROUND PROTECTION



HOLD POINT	RESPONSIBILITY	CERTIFICATION BY
INDUCT DEMOLITION AND CONSTRUCTION STAFF INTO TREE PROTECTION MANAGEMENT PLAN	DEMOLITION/BUILDING CONTRACTOR	PROJECT ARBORIST
INSTALL TREE PROTECTION MEASURES (TRUNK PROTECTION)	DEMOLITION/BUILDING CONTRACTOR	PROJECT ARBORIST

REV	DESCRIPTION	DATE
A	FOR DA SUBMISSION	29/10/2023

LEGEND

TPZ - RECOMMENDATIONS

Retain - generic

DRAWN: KH
DWG NO: TPMP.01
SCALE: 1:200@A3

2.5 0 2.5 5 m

PROJECT:
PROPOSED MEDICAL CONSULTING ROOMS
DWG:

TREE PROTECTION MANAGEMENT PLAN - DEMOLITION

CLIENT: JODIE ELLIS-CLARK
SITE: 45 ORTH ST, KINGSWOOD NSW 2747

PO Box 902
Five Dock NSW 2046
E: info@canopyconsulting.com.au
P: 1300 1 CANOPY

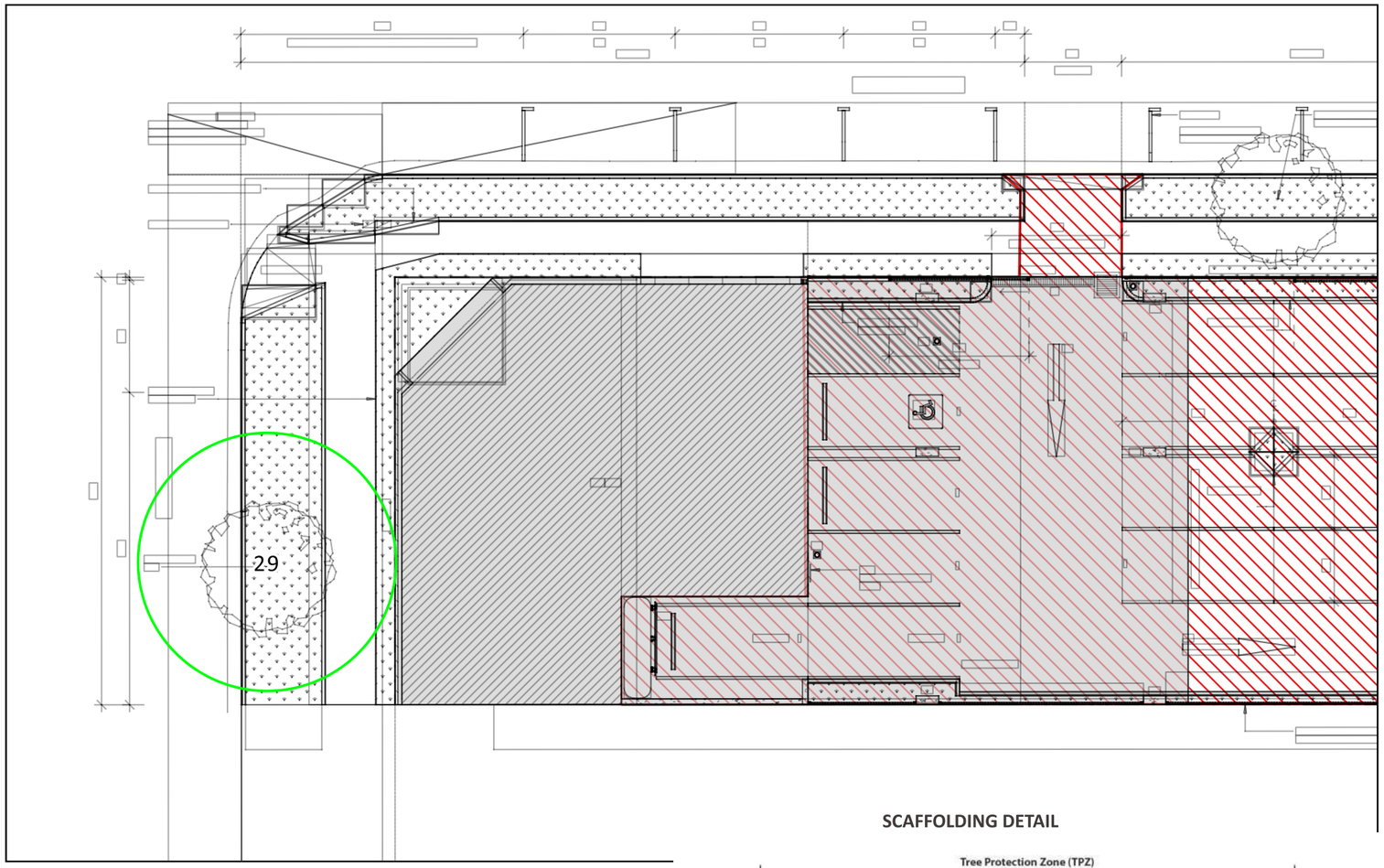
canopy consulting

SCAFFOLDING

WHERE SCAFFOLDING IS REQUIRED IT SHOULD BE ERECTED OUTSIDE THE TPZ. WHERE IT IS ESSENTIAL FOR SCAFFOLDING TO BE ERECTED WITHIN THE TPZ, BRANCH REMOVAL SHOULD BE MINIMISED. THIS CAN BE ACHIEVED BY DESIGNING SCAFFOLDING TO AVOID BRANCHES OR TYING BACK BRANCHES. WHERE PRUNING IS UNAVOIDABLE IT MUST BE SPECIFIED BY THE PROJECT ARBORIST IN ACCORDANCE WITH AS 4373-2007 PRUNING OF AMENITY TREES. NOTE: PRUNING WORKS WILL REQUIRE APPROVAL BY DETERMINING AUTHORITY.
THE GROUND BELOW THE SCAFFOLDING SHOULD BE PROTECTED BY BOARDING (E.G. SCAFFOLD BOARD OR PLYWOOD SHEETING) AS DEPICTED. WHERE ACCESS IS REQUIRED, A BOARDWALK OR OTHER SURFACE MATERIAL SHOULD BE INSTALLED TO MINIMISE SOIL COMPACTION. BOARDING SHOULD BE PLACED OVER A LAYER OF MULCH AND IMPERVIOUS SHEETING TO PREVENT SOIL CONTAMINATION. THE BOARDING SHOULD BE LEFT IN PLACE UNTIL THE SCAFFOLDING IS REMOVED.

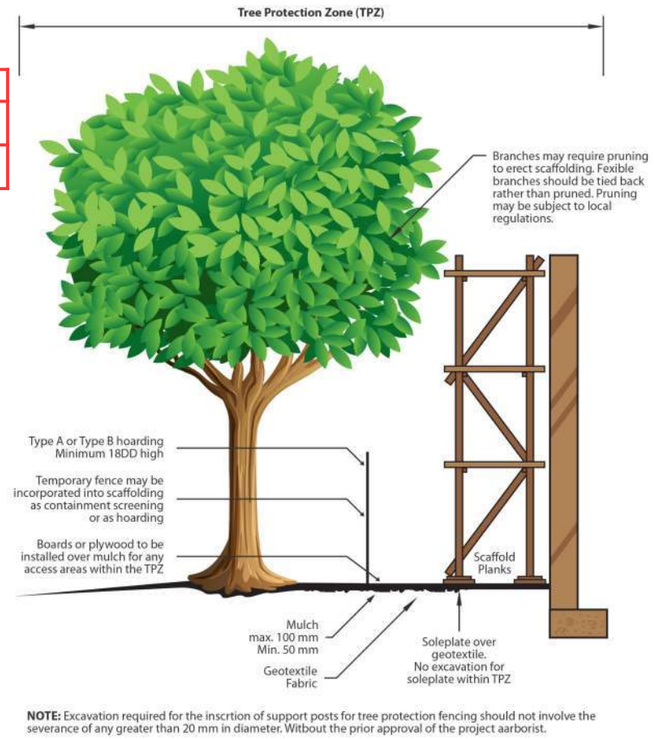
UNDERGROUND SERVICES

ALL UNDERGROUND SERVICES SHOULD BE ROUTED OUTSIDE THE TPZ OF TREES TO BE RETAINED. WHERE UNAVOIDABLE, SERVICES MAY BE INSTALLED VIA ALTERNATIVE METHODS WHICH MAY INCLUDE TREE SENSITIVE EXCAVATION OR HORIZONTAL DIRECTIONAL DRILLING (HDD). WHERE HDD IS USED, ENTRY AND EXIT PITS ARE TO BE LOCATED OUTSIDE THE TPZ OF TREES TO BE RETAINED.
WHERE EXCAVATION OR TRENCHING IS REQUIRED TO FACILITATE THE INSTALLATION OF UNDERGROUND SERVICES WITHIN THE TPZS OF ANY SITE TREES ARBORIST SUPERVISION IS REQUIRED. WORKS SHOULD BE UNDERTAKEN USING TECHNIQUES THAT ARE SENSITIVE TO TREE ROOTS TO AVOID UNNECESSARY DAMAGE. SUCH TECHNIQUES INCLUDE
EXCAVATION BY HAND
EXCAVATION USING A HIGH-PRESSURE WATER JET AND VACUUM TRUCK
EXCAVATION USING AN AIR SPADE WITH A VACUUM TRUCK.
MACHINE EXCAVATION IS PROHIBITED WITHIN THE TPZS OF RETAINED TREES UNLESS UNDERTAKEN AT THE DIRECT CONSENT FROM THE PROJECT ARBORIST AND/OR THE RESPONSIBLE AUTHORITY.
WHERE A SITUATION OCCURS THAT A SIGNIFICANT ROOT (ROOT GREATER THAN >40 MM DIAMETER) REQUIRES PRUNING OR REMOVAL, THE ROOT IS TO BE SEVERED WITH A SHARP SAW IMPLEMENT BY OR UNDER THE INSTRUCTION OF THE PROJECT ARBORIST.



HOLD POINT	RESPONSIBILITY	CERTIFICATION BY
SUPERVISE ALL EXCAVATION AND CONSTRUCTION WORKS WITHIN THE TREE PROTECTION ZONE.	DEMOLITION/BUILDING CONTRACTOR	PROJECT ARBORIST
IF REQUIRED, SUPERVISE INSTALLATION OF SCAFFOLDING.	DEMOLITION/BUILDING CONTRACTOR	PROJECT ARBORIST

SCAFFOLDING DETAIL



NOTE: Excavation required for the inscrtion of support posts for tree protection fencing should not involve the severance of any greater than 20 mm in diameter. Witbout the prior approval of the project aarborist.

REV	DESCRIPTION	DATE
A	FOR DA SUBMISSION	29/10/2023

LEGEND

TPZ - Recommendations

Retain - generic

DRAWN: KH
DWG NO: TPMP.02
SCALE: 1:200@A3

2.5 0 2.5 5 m

PROJECT:
PROPOSED MEDICAL CONSULTING ROOMS

DWG:

TREE PROTECTION MANAGEMENT PLAN - BUILDING CONSTRUCTION

CLIENT: JODIE ELLIS-CLARK
SITE: 45 ORTH ST, KINGSWOOD NSW 2747

PO Box 902
Five Dock NSW 2046
E: info@canopyconsulting.com.au
P: 1300 1 CANOPY

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LANDSCAPING WORKS WITHIN TREE PROTECTION ZONES

THE LANDSCAPE PLAN IS TO BE CHECKED FOR COMPLIANCE WITH THE TPMP. STAGED REMOVAL OF TREE PROTECTION METHODS IS PERMISSIBLE AT THE DISCRETION OF THE PROJECT ARBORIST.
ANY LANDSCAPING WORKS WITHIN THE TPZ OF TREES TO BE RETAINED ARE TO BE UNDER THE DIRECT SUPERVISION OF THE PROJECT ARBORIST. THESE MAY INCLUDE BUT ARE NOT LIMITED TO; RETAINING WALLS, IRRIGATION AND LIGHTING SYSTEMS, TOPDRESSING, PLANTING AND PAVING.
ANY LANDSCAPING WORKS REQUIRING EXCAVATION FOR DRAINAGE OR THE LIKE IS TO BE UNDERTAKEN USING NON-DESTRUCTIVE METHODS. NO MACHINE CULTIVATION IS PERMITTED WITHIN THE TPZ

FILL WITHIN TREE PROTECTION ZONES

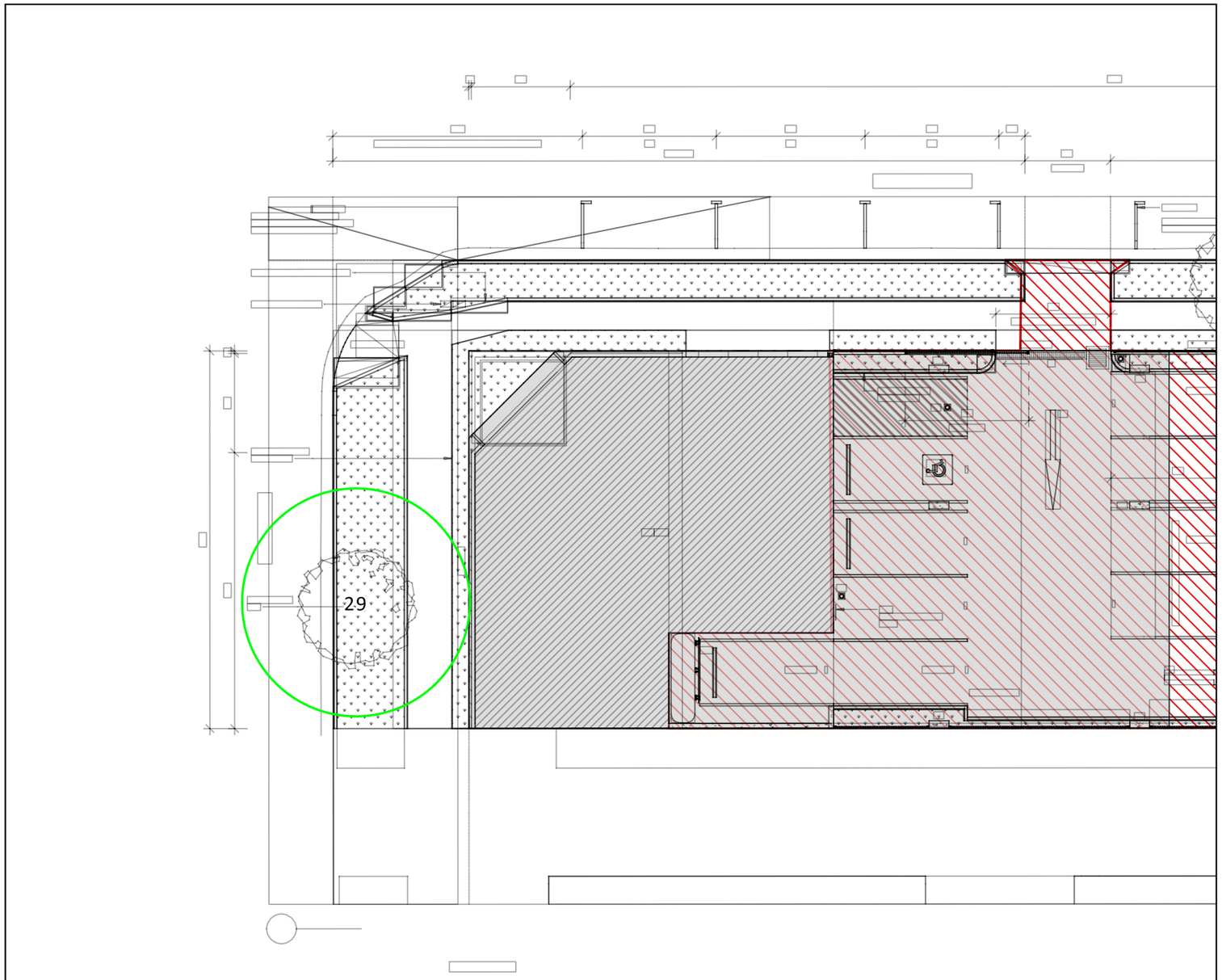
WHERE UNAVOIDABLE, FILL PLACED WITHIN TPZ OF TREES TO BE RETAINED SHALL BE WELL-DRAINED MATERIAL EQUIVALENT OR FINER IN TEXTURE THAN THE EXISTING SITE TOPSOIL MATERIAL AND SHOULD COMPLY WITH AS 4419:2003 SOILS FOR LANDSCAPING AND GARDEN USE.
THE FILL CAN BE LIGHTLY CONSOLIDATED BUT NOT TO ENGINEERING STANDARDS. IF FILL IS TO BE PLACED BY MACHINERY, THIS MUST BE DONE FROM OUTSIDE THE TPZ OR FROM EXISTING HARD STAND AREAS. ALTERNATIVELY, GROUND, TRUNK AND BRANCH PROTECTION MAY BE USED TO FACILITATE MACHINE ACCESS.

DEFECTS LIABILITY PERIOD

COMPLETION OF OUTSTANDING BUILDING OR LANDSCAPING WORKS FOLLOWING THE CONSTRUCTION PERIOD MUST NOT INJURE TREES.

FINAL CERTIFICATION

THE FINAL INSPECTION BY THE PROJECT ARBORIST SHOULD DETAIL THE HEALTH AND CONDITION OF THE TREES AND THEIR GROWING ENVIRONMENT AND PROVIDE RECOMMENDATIONS FOR ANY NECESSARY REMEDIAL ACTIONS. THESE ACTIONS MAY INCLUDE PRUNING IN ACCORDANCE WITH AS 4373-2007 PRUNING OF AMENITY TREES AND/OR SOIL REMEDIATION TO REPAIR THE GROWING ENVIRONMENT.
ON PROJECT COMPLETION, THE PROJECT ARBORIST SHALL CERTIFY IN WRITING TO THE CERTIFYING AUTHORITY THAT THE CONDITIONS OF CONSENT RELATING TO TREE PROTECTION, TREE REMOVAL, PRUNING AND PLANTING OF NEW TREES HAVE BEEN COMPLIED WITH OR, IF THE CONDITIONS HAVE BEEN CONTRAVENED, DETAIL THE EXTENT AND NATURE OF THE DEPARTURE FROM THE CONDITIONS AND THEIR IMPACTS ON TREES.



HOLD POINT	RESPONSIBILITY	CERTIFICATION BY
SUPERVISE ALL LANDSCAPE AND POST-CONSTRUCTION WORKS WITHIN THE TREE PROTECTION ZONE.	DEMOLITION/BUILDING CONTRACTOR	PROJECT ARBORIST
FINAL CERTIFICATION	DEMOLITION/BUILDING CONTRACTOR	PROJECT ARBORIST

REV	DESCRIPTION	DATE
A	FOR DA SUBMISSION	29/10/2023

LEGEND

TPZ - Recommendations

Retain - generic

DRAWN: KH
DWG NO: TPMP.03
SCALE: 1:200@A3

2.5 0 2.5 5 m

PROJECT:
PROPOSED MEDICAL CONSULTING ROOMS

DWG:

TREE PROTECTION MANAGEMENT PLAN - LANDSCAPE/POST-CONSTRUCTION

CLIENT: JODIE ELLIS-CLARK
SITE: 45 ORTH ST, KINGSWOOD NSW 2747

PO Box 902
Five Dock NSW 2046
E: info@canopyconsulting.com.au
P: 1300 1 CANOPY

canopy consulting

ABN: 79635639100
ACN: 635639100
0432 633 402
info@canopyconsulting.com.au
www.canopyconsulting.com.au

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@canopyconsulting