PRELIMINARY ARBORICULTURAL ASSESSMENT

133 and 135 Gower Street, Preston, 3072

Prepared for:

Kelly Kwan
Virtue Property Group Pty Ltd
P.O. Box 1086
Wendouree Village, Wendouree VIC 3355
0414 886 186
kelly@virtuepg.com

admin@eraus.com.au

(03) 8376 6403

www.eraus.com.au

Document information

Owner:	Ecology & Restoration Australia Pty Ltd
Date:	27 July 2023
Author/s:	Chris White BSc (Env)(Hons) Ph 0401 483 141 E- chris.w@eraus.com.au

Contents

1 Introduction

1.1 Purpose

Ecology and Restoration Australia (ERA) has been engaged by Virtue Property Group Pty Ltd to prepare a Preliminary Arboricultural Assessment to inform the proposed development of land at two adjoining sites at 133 and 135 Gower Street Preston (collectively referred to as the site).

This assessment has been prepared in accordance with Australian Standard 4970-2009 *Protection of Trees on Development Sites*. It is intended that the information within this report will be used to inform the design of the development of the site, and it provides advice on the protection of those trees likely to be retained at or near the site

1.2 Scope

This report provides an assessment of all trees (greater than 5 metres in height) within the site and within close proximity to the site boundaries. The assessment provides an accurate location for each tree, and considers their health, structure and amenity value.

ERAus were engaged to:

- Identify and assess those trees within (and close to) the boundaries of the site and that may be impacted by any future land use change at the site.
- Undertake a ground-based evaluation to assess each subject tree and provide its location, dimensions, health, structure, amenity value and Useful Life Expectancy (ULE).

2 Method

A desktop review of the planning context of the site was undertaken to identify any overlays that may have implications for the removal of vegetation at the site. Aerial imagery was reviewed to understand the density and possible significance of the trees both on the site and within the local area.

A site assessment was undertaken by the report author in the morning of the 12th July 2023. Any tree greater than 5 metres in height and/or that may suffer from a TPZ encroachment were assessed. This included trees located within neighbouring properties.

The following information was collected for the trees:

- Tree Species
- Height (m)
- Crown Spread (m)
- Diameter at Breast Height (DBH) (cm)
- Health
- Structure
- Amenity value
- A photograph of each tree

A ground based visual inspection was undertaken of all trees according to the principles of Visual Tree Assessment and tree hazard assessment described in Harris, Clark and Matheny (1999) and Mattheck and Breloer (1994).

Tree location has been determined using survey plans provided by the client.

Health, Structure and Amenity value are qualitative values derived from visual indicators and the authors experience and qualifications.

Encroachment of TPZs by the development has been calculated using CAD software.

3 Limitations

- Root assessment requiring excavation was not undertaken. Therefore, root condition has not been included unless above ground signs, such as soil heaving or cracking were observed
- Aerial examination (tree climbing) was not undertaken
- Tree height and canopy width were estimated
- Environmental weeds, shrubs, dead trees and juvenile exotic trees of low amenity/retention value were not assessed individually
- Diameter at Breast Height (DBH) of some trees was estimated where access to the trunk was prevented.

4 Results

4.1 Subject Site

4.1.1 Existing conditions

133 and 135 Gower Street, Preston support a single storey rendered brick residence that spans both sites. Additional to the residence, 133 supports a clad granny flat in the rear yard, and 135 supports a freestanding small steel shed as the only other buildings on the site. Most of the vegetation on the subject site is dominated by exotic ornamental species of low amenity value. A small-to-medium Monterey Cypress is the largest tree on the site. All other trees within the boundaries of the site are small and of low amenity value.

4.1.2 Planning context

The site is within the jurisdiction of the Darebin City Council and is zoned as General Residential Zone- Schedule 2 (GRZ2) under the Darebin Planning Scheme. A Development Contributions Plan Overlay-Schedule 1 (DCPO1) apply to the site.

4.1.3 Proposed works

A planning permit application will be made to allow for the development of the site. Should the proposed development be received favourably, any future development of the site will need to provide an Arboricultural Impact Assessment to inform a planning permit application.

4.2 Tree data

TREE #	1			
SPECIES	*Lophostemon confertus*			
COMMON NAME	Queensland Brush Box			
TYPE	Non-indigenous Native			
DBH (CM)	53			
HEIGHT (M)	9			
SPREAD (M)	10			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Medium			
ULE (YRS)	15-40	TPZ (M)	6.4	
NOTES	Street tree growing ~4.5 metres from the crossover of 133 Gower Street. Co-dominant primary union from 1.4 metres height- union appears sound. Past removal of some lower branches for street clearance.			
IMPACT	TBC			
RECOMMENDATIONS	Erect TPZ fencing surrounding this tree to protect it from development related impacts. The fencing should remain within the bounds of the nature strip and not impede pedestrian or vehicle traffic.			

TREE #	2			
SPECIES	*Calistemon* sp			
COMMON NAME	Bottlebrush			
TYPE	Non-indigenous Native			
DBH (CM)	<10			
HEIGHT (M)	5			
SPREAD (M)	3			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	2.0	
NOTES	Tree growing 0.5 metres from the fence line on the property to the east of the subject site			
IMPACT	TBC			

TREE #	3			
SPECIES	*Melia azedarach*			
COMMON NAME	White Cedar?			
TYPE	Non-indigenous Native			
DBH (CM)	<10			
HEIGHT (M)	5			
SPREAD (M)	3			
STRUCTURE	Good			
HEALTH	God			
AGE	Juvenile			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	2.0	
NOTES	Street tree growing ~2 metres from the subject site in the road reserve of Gower Street. No diagnostic material for accurate identification. Recently planted.			
IMPACT	TBC			
RECOMMENDATIONS	Erect TPZ fencing surrounding this tree to protect it from development related impacts. The fencing should remain within the bounds of the nature strip and not impede pedestrian or vehicle traffic.			

TREE #	4 (x 5)			
SPECIES	*Yucca elephantipes*			
COMMON NAME	Spineless Yucca			
TYPE	Exotic			
DBH (CM)	25			
HEIGHT (M)	6			
SPREAD (M)	5			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	3.0	
IMPACT	TBC			

TREE #	5			
SPECIES	*Musa* sp			
COMMON NAME	Banana			
TYPE	Exotic			
DBH (CM)	N/A			
HEIGHT (M)	7			
SPREAD (M)	5			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	3.5	
IMPACT	TBC			

TREE #	6 (x 7)			
SPECIES	*Cupressus sempervirens*			
COMMON NAME	Italian Cypress			
TYPE	Exotic			
DBH (CM)	~15			
HEIGHT (M)	5			
SPREAD (M)	1			
STRUCTURE	Good			
HEALTH	Good			
AGE	Juvenile			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	2.0	
NOTES	Group of 7 trees planted 0.3 metres from the fence line on the property to the east of the subject site			
IMPACT	TBC			

TREE #	7			
SPECIES	*Ligustrum lucidum*			
COMMON NAME	Broad-leaf Privet			
TYPE	Exotic			
DBH (CM)	<10			
HEIGHT (M)	5			
SPREAD (M)	4			
STRUCTURE	Good			
HEALTH	Good			
AGE	Juvenile			
AMENITY VALUE	Low			
ULE (YRS)	5-15	TPZ (M)	2.0	
NOTES	Multi-stemmed from ground level- union appears sound			
IMPACT	TBC			

TREE #	8			
SPECIES	*Prunus* sp			
COMMON NAME	Plum			
TYPE	Exotic			
DBH (CM)	27			
HEIGHT (M)	7			
SPREAD (M)	6			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	3.2	
NOTES	Co-dominant primary union from near ground- union appears sound			
IMPACT	TBC			

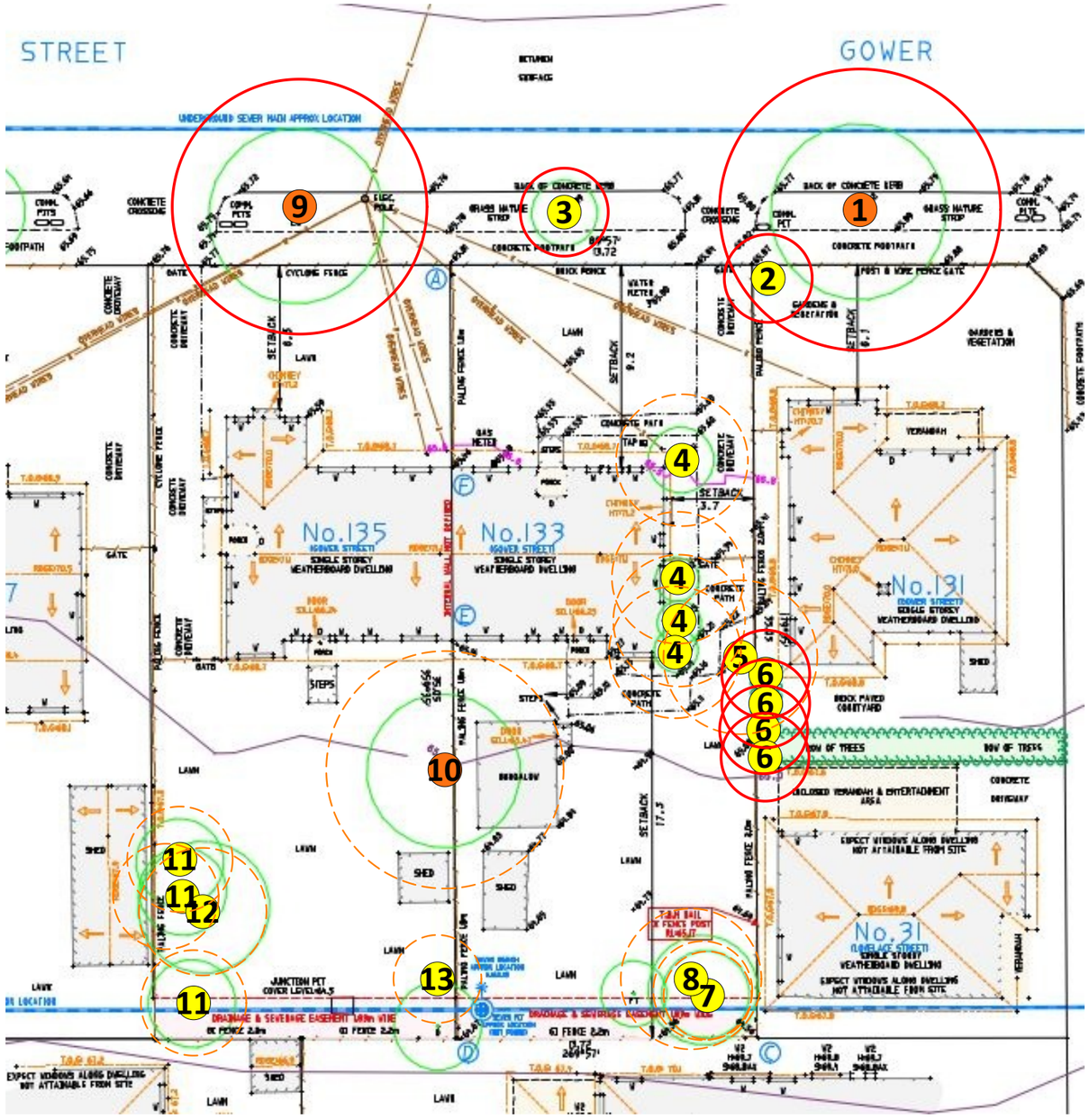
TREE #	9			
SPECIES	*Lophostemon confertus*			
COMMON NAME	Queensland Brush Box			
TYPE	Non-indigenous Native			
DBH (CM)	48			
HEIGHT (M)	10			
SPREAD (M)	9			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Medium			
ULE (YRS)	15-40	TPZ (M)	5.8	
NOTES	Street tree growing ~2 metres from the subject site. Co-dominant primary union from 2 metres height- union appears sound. Pruning of central crown for powerline clearance.			
IMPACT	TBC			
RECOMMENDATIONS	Erect TPZ fencing surrounding this tree to protect IT from development related impacts. The fencing should remain within the bounds of the nature strip and not impede pedestrian or vehicle traffic.			

TREE #	10			
SPECIES	*Hesperocyparis macrocarpa*			
COMMON NAME	Monterey Cypress			
TYPE	Exotic			
DBH (CM)	~45			
HEIGHT (M)	11			
SPREAD (M)	9			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Medium			
ULE (YRS)	40+	TPZ (M)	5.4	
IMPACT	TBC			

TREE #	11 (x 2)			
SPECIES	*Coprosma repens*			
COMMON NAME	New Zealand Mirror Bush			
TYPE	Exotic			
DBH (CM)	~20			
HEIGHT (M)	5			
SPREAD (M)	6			
STRUCTURE	Good			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	2.4	
IMPACT	TBC			

TREE #	12			
SPECIES	*Prunus* sp			
COMMON NAME	Plum			
TYPE	Exotic			
DBH (CM)	24			
HEIGHT (M)	8			
SPREAD (M)	6			
STRUCTURE	Fair			
HEALTH	Good			
AGE	Mature			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	2.9	
IMPACT	TBC			

TREE #	13			
SPECIES	*Prunus* sp			
COMMON NAME	Plum			
TYPE	Exotic			
DBH (CM)	<10			
HEIGHT (M)	6			
SPREAD (M)	4			
STRUCTURE	Good			
HEALTH	Good			
AGE	Juvenile			
AMENITY VALUE	Low			
ULE (YRS)	15-40	TPZ (M)	2.0	
IMPACT	TBC			



LEGEND

Tree Number and Amenity Value

- # -High
- # -Medium
- # -Low

Tree Protection Zone (TPZ) - to be retained

Tree proposed for removal

N

SITE PLAN

133 and 135 Gower Street, Preston

S/T **Trees/shrubs shown on this plan that have not been individually assessed are either; small, low amenity value, or unlikely to be impacted by works.**

TPZ no go zones must be established (as per the above plan) to exclude access from the protected TPZ. Protective fencing (unless otherwise directed) must be of a chain mesh or similar type at a minimum height of 1.8m and held in place with concrete feet. Signage must be placed on the fencing and be clearly visible- "TPZ- No Access".

Date: 27/07/2023

Drawn to scale @ A3 (Not to print scale)

ERA Ref: gowe0723cw_PAA

ERAus
ECOLOGY & RESTORATION AUSTRALIA
ABN 95 655 597 210
www.eraus.com.au
Email: admin@eraus.com.au
Tel: (03) 8376 6403

5 Discussion

No trees of high amenity value were recorded during the site assessment. Only three trees recorded were of medium amenity value, and of these, only one was located on the subject site. Two are growing as street trees within the road reserve of Gower Street. All other trees were considered exotic, ornamental species, and all were of low amenity value.

Designing a development that will minimise the loss of these significant (high amenity value) trees will benefit the local amenity within proximity to the site, but will may also benefit the speed of the application for both the subdivision and any future development.

Development works at the site can include (but may not be limited to):

- Demolition
- Building and construction
- Site cut and fill
- Parking and movement of construction vehicles
- Storage of construction materials
- Installation of driveways and pathways
- Trenching for underground services.

All of these activities can have a significant impact on a tree where they occur within the TPZ. Careful consideration of the placement and intensity of all activities will help minimise impacts to the trees and should be considered during early design of the proposed future development.

The future building design should seek to avoid impacting any more than 10% of the TPZ (by area) of these trees on neighbouring properties.

6 Conclusion

The arboricultural assessment undertaken at 133 and 135 Gower Street Preston comprised 13 trees (including three tree groups). Of these, 9 were located within the boundaries of the subject site and three trees were growing within the road reserve of Gower Street . One tree is growing close to the boundary on the property to the east of the subject site.

23% of the trees assessed are considered to be of medium amenity value with the remainder (77%) considered to be of low amenity value.

Descriptions of amenity values can be found in 8- Definitions and descriptors

7 Recommendations

- Ensure all works avoid impacting the TPZ of as many trees as is practicable- in particular high amenity value trees and trees on neighbouring properties.
- Include scaled Tree Protection Zones (TPZs) on proposed plans for all assessed trees (see tree data for TPZ measurements)
- If it is not possible to avoid all interaction with the TPZ of any particular tree, then keeping the encroachment to less than 10% of the area of the TPZ will minimise impacts and is generally acceptable. If encroachments are over 10% by area, the project arborist may be required to demonstrate that the tree will not be impacted
- All proposed works must be shown on plans. Site cut and fill, location of buildings, driveways and pathways, all underground services, including storm water and sewerage should all be clearly displayed.
- Design of any underground services and landscaping should be cognisant of root protection. Do not excavate within the nominated Tree Protection Zones of retained trees unless permitted by the responsible authority

8 References:

- Department of Environment, Land, Water and Planning. VicPlan, Accessed July 2023, Available at: https://mapshare.vic.gov.au/vicplan/
- Mattheck, C. and Breloer, H. (1994), *The Body Language of Trees: A Handbook for Failure Analysis*, London: HMSO.
- Costermans, L. (1981), *Native Trees and Shrubs of South-Eastern Australia*, New Holland publishers (Australia) Pty Ltd, Sydney
- ProofSafe Tree Protection Zone encroachment calculator, available online at: https://proofsafe.com.au/tpz_incursion_calculator.html
- Standards Australia (2009), AS 4970-2009 Protection of trees on development sites

9 Definitions and descriptors

Age Class

Category	Description
Senescent	The gradual deterioration in the functional characteristics of a tree. Health and/or structure may be impacted by advanced age
Mature	Tree has reached the expected size for the species at the site.
Semi-mature	Reproductive, but not yet the expected size of the species
Juvenile	Recently planted or young self-sown specimen

Amenity/Retention Value

Category	Description
Very High	Exceptional tree of good health and quality. A prominent landscape feature and of historic, cultural, or ecological significance. These trees should be a particular focus of protection.
High	A tree at or close to mature size with a long life expectancy. A prominent tree within the site and the local environment. Of good health and structure and of heritage and or ecological value
Medium	Moderate size and/or ULE, fair health/structure. Relatively prominent within the site and local area.
Low	Small common species, in poor condition and/or providing limited amenity value within the site or local area. The tree may be a weed species, or may be easily replaced within the landscape.

Common Name

The plain English name for a tree species. Can vary between locales and each tree can have several common names.

Diameter at Breast Height

The diameter of the trunk of a tree measured at breast height (1.4m above ground level). Typically measured using a diameter tape. The diameter of a tree is used to calculate the Tree Protection Zone.

Health

Category	Description
Good	The tree is demonstrating good or exceptional growth. The tree possesses a full or very close to full canopy of foliage with minimal or no pest or diseases problems.
Fair	The tree is in reasonable condition presents an adequate canopy of foliage. Some minor deadwood or dieback may suggest stress. Minor leaf damage from pests
Poor	Much deadwood and dieback suggests a tree under stress. Minimal foliage, or extensively damaged leaves from pests and diseases suggest a rapid decline and possible death.
Dead	Tree is metabolically inactive.

Origin

Category	Description
Indigenous	The species is of local or at least regional provenance.
Australian Native	The origin of the tree is from Australia, but is not naturally found locally
Exotic	The tree originates from outside Australia.

Species

The scientific (or latin) name that classifies the genus and species of the tree. Each scientific name if unique to that species.

Structure

Category	Description
Good	A tree of sound structure with a balanced crown. Sound branch unions with no obvious defects in branch or trunk
Fair	Slightly unbalanced crown. Some branch unions may have minor structural faults like included bark. Single-trunked tree may be on a lean, or may present with some structural faults including slight decay.
Poor	Clear signs of structural weakness in trunk or branches or both. Failure may be likely in the short term. Decay evident in trunk or within hollows in branches.
Very Poor	Significant structural defects. Tree has failed, or is in imminent risk of failure.

Useful Life Expectancy

Category	Description
40+	The tree is in excellent condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component in excess of 40 years
15-40	The tree is in good condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component for 20-40 years.
5-15	The tree is in fair to poor condition, may not be a long-lived species and/or may be structurally unsound. Under normal conditions and with appropriate management, the tree may only remain within the landscape component in the short-to-medium term.
0-5	Tree is dead or in significant decline.

10 Tree Protection

Development works that occur within proximity to a tree have the potential to significantly impact its ULE, regardless of how far the physical construction of from the base of the tree. Roots, trunk and branches can all be impacted, and damage to each or all of these features can lead to the decline in the vitality of the tree.

Damage to the root system of trees is one of the most common causes of the decline of trees on development sites. Excavation including trenching and site levelling can cause rots to be severed and wounded. The passage of construction vehicles above the root plate of a tree may result in compaction which reduces the pore space of the soil and restricts the exchange of gases between the soil and the environment. Soil compaction can also alter the nature of the drainage within a site, and this can significantly impact the health of a tree, even if that tree is some distance from the compaction.

Trunks and branches of retained trees may suffer wounding from mechanical impacts during the demolition and construction work at a site. This can encourage decay at the site of the wound, but may also impact the transportation of water and nutrients from the roots to the leaves. The removal of the leaves of a tree constrain the ability of the tree to photosynthesize, and hence may place the tree at risk of premature decline.

It is therefore important that trees proposed to be retained on the site are subject to protection measures during all activities associated with the development.

Tree Protection Zones

The establishment on site of a Tree Protection Zone (TPZ) is the principal means of protecting trees on a development site. The TPZ area should be isolated from construction disturbance area, so that the tree remains viable. The TPZ is calculated according to the Australian Standard (AS 4970-2009) for the subject trees- being 12 times the DBH, measures as a radius from the centre of the trunk of a tree.

A TOPZ is never less than 2m nor greater than 15m, except where additional crown protection is required. The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1m outside of the crown projection.

Structural Root Zone

The Structural Root Zone (SRZ) is the minimum an area around the base of a tree required to maintain that tree's stability in the ground. Any encroachment into the SRZ of a tree significantly increased the possibility of complete tree failure.

The SRZ is not relevant to the maintenance of tree health but is the minimum volume of roots required for the tree to remain standing (Mattheck and Breloer 1994).

According to AS4970-2009, the SRZ of the trees has been calculated using the equation:

$R\ srz = (D \times 50)0.42 \times 0.64$ where D if the trunk diameter measured above the root buttress.

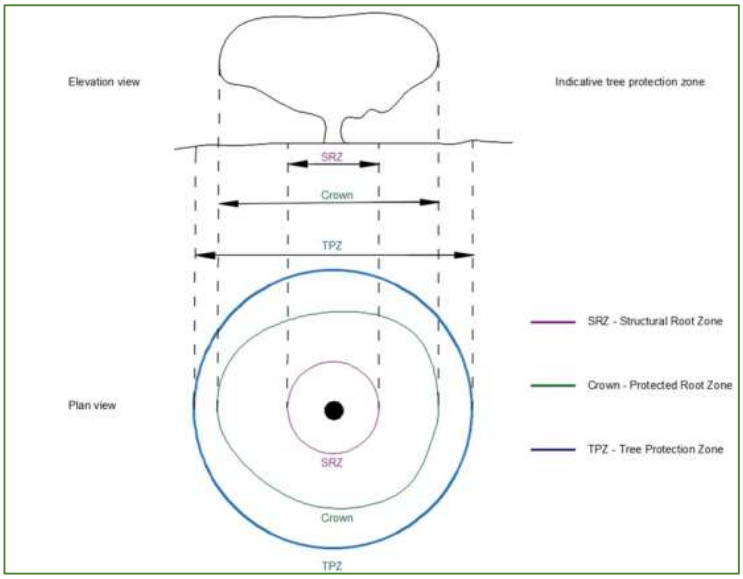


Figure 1- A graphical representation of the SRZ and TPZ of a tree

TPZ and SRZ encroachment

It may be possible to encroach into or make variations to the standard TPZ. Encroachment includes, but is not limited to, excavation, compacted fill and machine trenching. The following table defines the encroachment as per AS 4970-2009

Encroachment	Description
Minor	If the proposed encroachment is less than 10% of the area of the TPZ (but is outside the SRZ), detailed root investigations should not be required. The area

	lost to this encroachment should be compensated elsewhere but contiguous with the TPZ.
Major	If the encroachment is greater than 10% of the area of the TPZ and/or is within the SRZ, then the project arborist must demonstrate that the tree will remain viable. This may require root investigations via non-destructive methods. The area lost to this encroachment should be compensated elsewhere but contiguous with the TPZ.

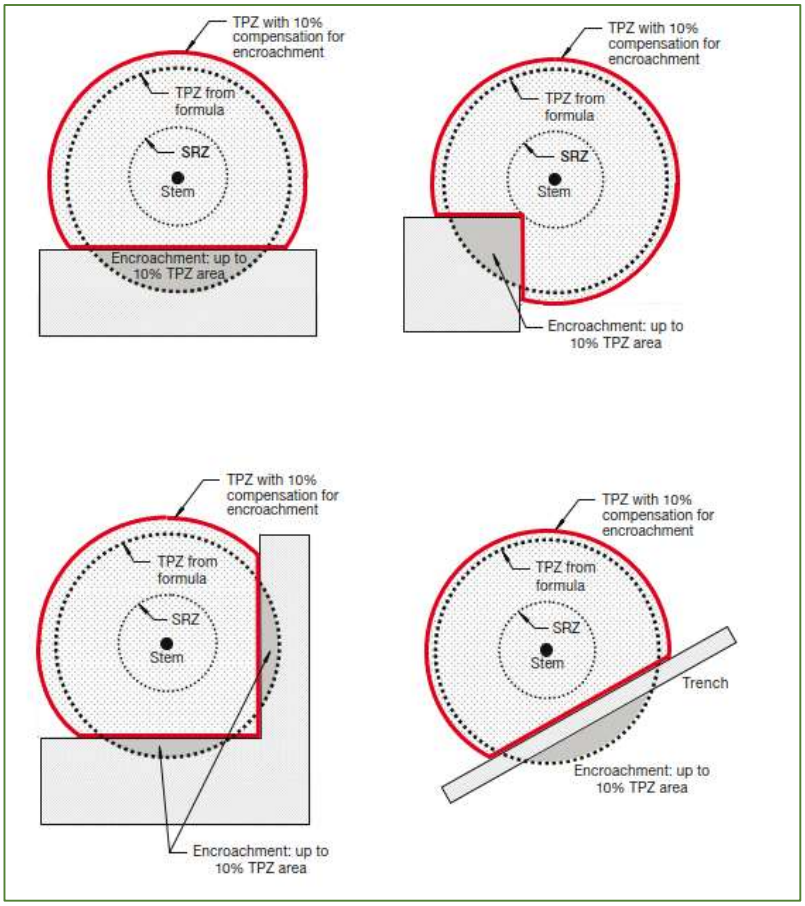


Figure 2- Examples of minor encroachments into a TPZ (from AS4970-2009)

Tree Protection Measures

Fencing

Usually fencing will delineate the Tree Protection Zones (TPZ) as defined by *AS 4970-2009 Protection of trees on development sites.*

Fencing is installed following permitted vegetation removal and pruning, but prior to site establishment. Unless stated otherwise and approved by the responsible authority, fencing should be retained until completion of all construction related activity.

The fence must provide high visibility and act as a physical barrier to construction activity. The fence should be adequately signed “Tree Protection Zone – No Access”, be sturdy and prevent the entry of heavy equipment, vehicles, workers and the public.

Where feasible, tree protection fencing will consist of chain wire mesh panels held in place with concrete feet. Where chain mesh fencing is impractical to implement, alternate protection measures must be arranged.

If temporary access to the TPZ is required, protection for the trunk, branches or ground may be required. The materials and positioning of protection will be specified by the project arborist.

For temporary foot traffic through the TPZ, this may be facilitated using sheets of heavy plywood or similar material; this should not be considered a long term solution.

For machinery access within the TPZ, ground protection should be utilised to prevent root damage and soil compaction. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch, or crushed rock below rumble boards or HPDE track mats. These measures may also be applied to root zones beyond the TPZ.

Where roots within the TPZ are exposed during approved works, temporary root protection should be installed to prevent them drying out. This may include jute mesh or hessian sheeting as multiple layers over any exposed roots and the excavated soil profile, extending to the full depth of the root zone. Root protection sheeting should be pegged in place and kept moist at all times.

Signage

Highly visible and easy to read signs should be hung from the installed tree protection fencing to clearly identify the zone for all site personnel.

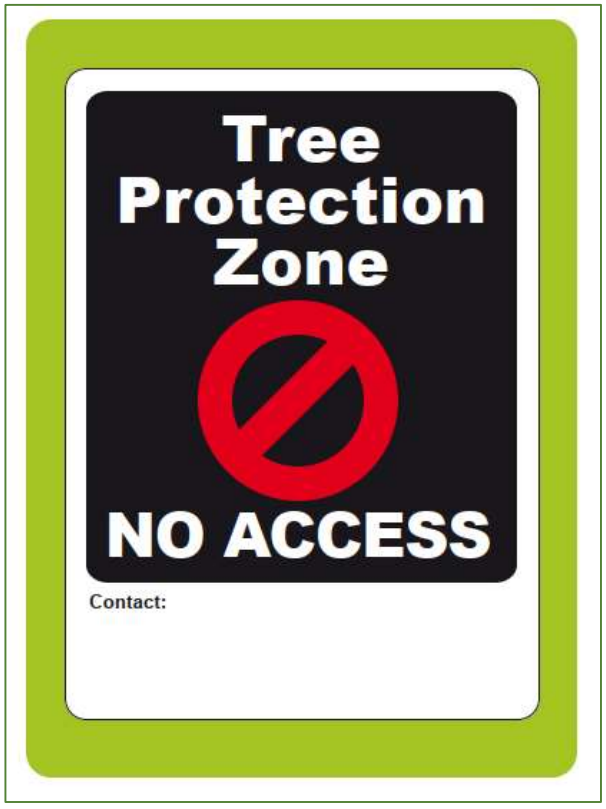


Figure 3- Example of appropriate signage (from AS4970-2009)

Site cut and fill has the potential to physically impact roots and thus should be located to ensure minimal disturbance within the TPZ of retained trees. If a shallow cut is proposed within a TPZ, consider increasing fill to eliminate the cut. If the grade is to be raised, the material should be coarser or more porous than the underlying material. If site cuts must occur, avoid batter cuts and instead design a vertical retaining wall to minimise disturbance.

Installation of underground services should also be routed outside TPZs; if there is no other option, they should be installed using non-destructive methods such as air or hydro excavation, or installed by boring under the TPZ at a depth of at least 700 mm (where practicable). The project arborist should assess the likely impacts of boring (including bore pit locations) on retained trees.

Driveways and pathways should not encroach into a TPZ; if encroachment is unavoidable, any hard surfaces should:

1) not involve any scraping or excavation – most small absorbing roots are within the upper 100mm of soil.

2) be constructed of a permeable material and laid on a base and sub-base specifically designed to allow the movement of water through and into the soil below.

If buildings are permitted within a TPZ, foundations should be suspended on piers leaving the ground undisturbed other than the careful placement of pier holes. The bottom of supporting beams should be above existing ground level or, if this is not possible, beams should run radially away from the tree trunk. There should be no excavation of any description, including piers, within a Structural Root Zone (SRZ).

All works within TPZs must be approved by the responsible authority prior to commencement.