A19 ARBORIST REPORT

St Kilda

PLANNING and ENVIRONMENT ACT
PORT PHILLIP PLANNING SCHEME

PERMIT NO. PA2402869

ENDORSED PLAN
Sheet 1 of 10

Signed: for
MINISTER FOR PLANNING
Date: 13 JUNE 2024

Brand Architects

ARBORICULTURE & ENVIRONMENT

Assessment of trees as part of proposed tramstop upgrades at Park Street, St Kilda

Arboricultural Impact Assessment

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14 February 2024

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1. Introduction

It is proposed to upgrade the tramstop on Park Street, near the intersection of Fitzroy Street in St Kilda. C&R Ryder Consulting has been engaged to complete an assessment of trees in proximity to works that could be affected. This report will provide:

- the findings of the assessment
- the impact of the proposed works to the trees
- any protection measures for trees to ensure their longevity.

2. Tree Assessment Method

Cameron Ryder inspected the trees opposite the on Friday, 12 January 2024. The following data were collected for the trees:

- Unique ID
- Image of tree
- Botanic and common name
- Tree dimensions (Height x Width)
- Diameter at breast height (DBH)
- Diameter at base (DAB)
- Health
- Structure
- Useful life expectancy (ULE)
- Tree significance
- Retention value
- Comments

Trees have been aligned to match the supplied feature survey. Tree protection detail has been prepared and mapped in accordance with AS4970-2009 *Protection of Trees on Development Sites.*

The trees were visually assessed from ground level, heights and widths were estimated and trunks measured with a diameter tape. No invasive tests were conducted or samples taken and any assessments of decay are qualitative only.

For all tree assessment descriptors, see Appendix 1.

3. Site Map

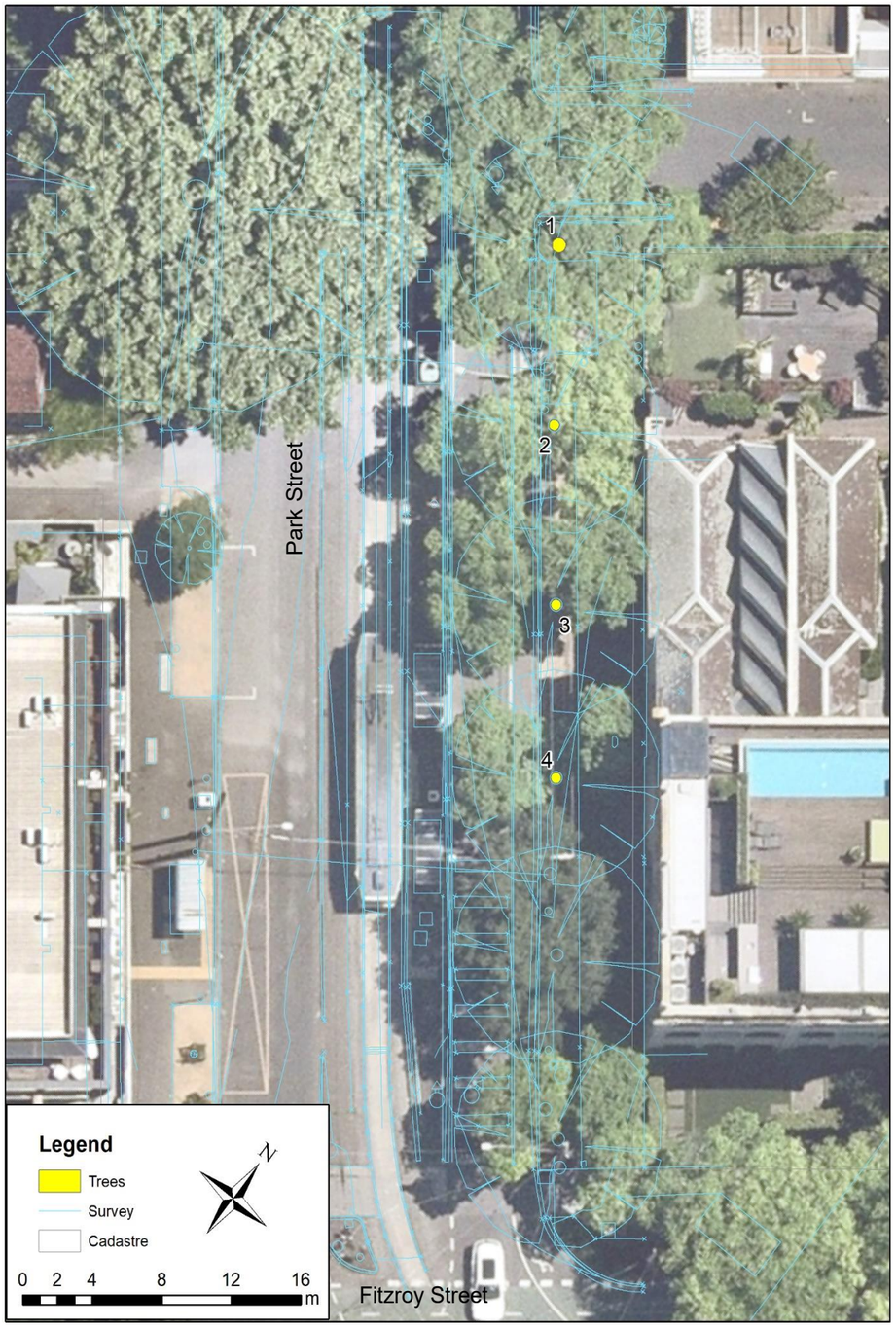
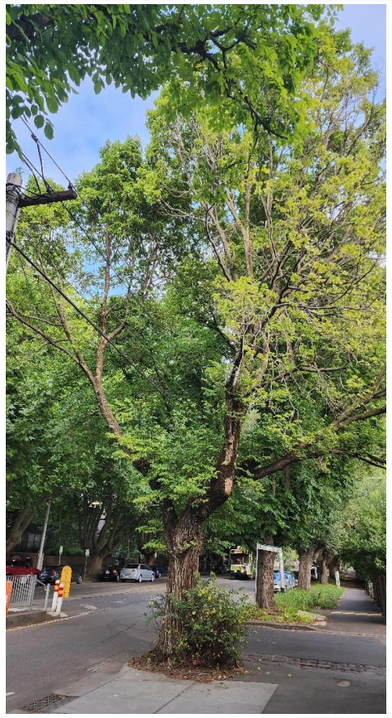
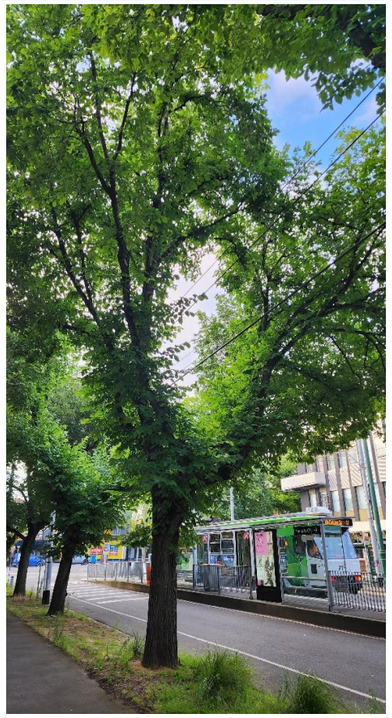


Figure 1: Aerial image of all trees.

4. Tree Details




Tree Number	1	2
Botanic Name	*Ulmus ×hollandica*	*Ulmus ×hollandica*
Common Name	Dutch Elm	Dutch Elm
Tree dimensions	15m x 12m	14m x 9m
DBH/ dia. @ base	71cm / 84cm	53cm / 63cm
Health	Fair	Fair
Structure	Fair	Fair
ULE	10-20 years	20+ years
Significance	Significant	Significant
Retention Value	High	High
TPZr | SRZr	8.5m | 3.1m	6.4m | 2.7m
Comments	Pruned under power lines, basal damage and decay with suckers	Pruned under power lines, minor decay and dieback




Tree Number	3	4
Botanic Name	*Ulmus ×hollandica*	*Ulmus ×hollandica*
Common Name	Dutch Elm	Dutch Elm
Tree dimensions	13m x 9m	10m x 9m
DBH/ dia. @ base	55cm / 67cm	45cm / 56cm
Health	Good	Good
Structure	Fair	Fair
ULE	20+ years	20+ years
Significance	Significant	Significant
Retention Value	High	High
TPZr | SRZr	6.6m | 2.7m	5.4m | 2.6m
Comments	Pruned under power lines, canopy growing towards power lines	Pruned under power lines, canopy growing towards power lines

5. Discussion

5.1 The Site

The subject site is Park Street near the intersection with Fitzroy Street in St Kilda (Figure 2). The street is characterised by large, mature, deciduous trees comprising elms *Ulmus* spp. and London Plane *Platanus ×acerifolia.* Works are proposed on the north-east side of the road.

Figure 2: The subject site with Tree 4 in the foreground.

5.2 The Trees

The 4 assessed trees are all Dutch Elm *Ulmus ×hollandica*. The trees are a deciduous, exotic species that has been widely planted across greater Melbourne. The trees are mature specimens that have been pruned many times:

- under low voltage power lines
- to provide clearance to the road
- to minimise interference with buildings to the north-east.

Whilst all of the trees have maintained a full canopy, there are signs of slow decline with minor dieback and decay. Given the trees are long-lived, the decline is likely to manifest over the coming decades and the trees should be retained for the medium to long-term.

All trees were assessed with a high retention value and should be retained as part of the proposal. The easiest way of ensuring the trees remain viable is with the installation of Tree Protection Zones (Appendix 2).

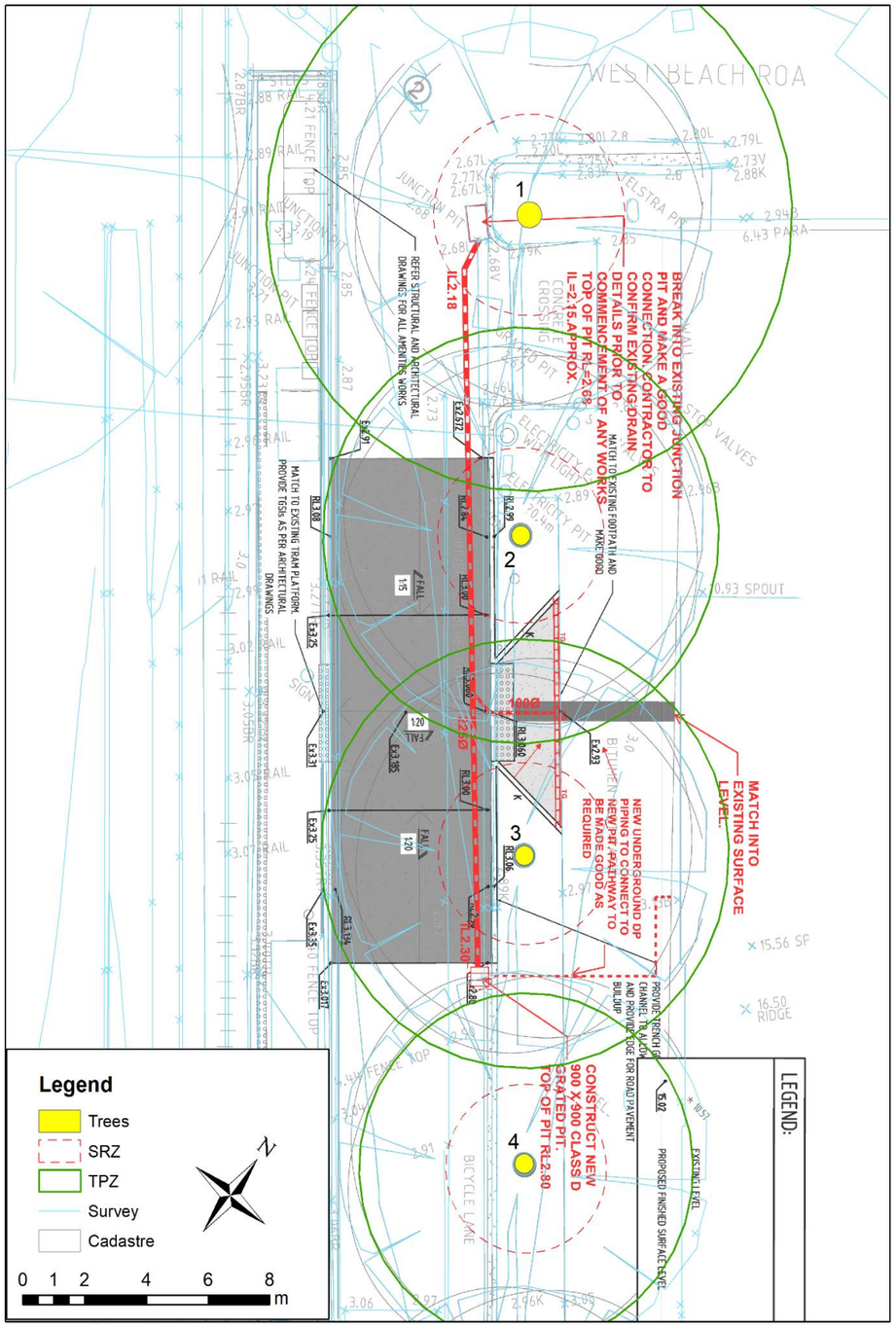
5.3 Design Proposal

The proposal will comprise the following elements:

- Installation of new raised pavement for access to the tram platform
- Drainage along Park Street to tie into and existing pit
- New, raised footpath to tie the existing footpath to the raised kerb crossing
- Remove and replace kerb along Park Street.

See section 5.4 TPZ & Proposed Map.

5.4 TPZ & Proposed Map



5.5 Construction Impact

The impact of the proposal on the trees' TPZs and SRZs have been assessed (Table 1). Trees with an assessment of 100% encroachment include those where the trunk is located within the development.

The percentage encroachments were calculated and the levels of impact were determined in accordance with AS 4970-2009, *Protection of Trees on Development Sites* as follows:

- **Major -** Encroachment >10% and/or SRZ intrusion
- **Minor** - Encroachment <10% and no SRZ intrusion
- **None** - No TPZ encroachment.

Table 1: Construction Impact

ID	Retention	TPZr (m)	SRZr (m)	Encroach-ment %	SRZ Intrusion	TPZ Encro-achment	Comments
1	High	8.5	3.1	14	Yes	Major	Tree is retained, works are in the road
2	High	6.4	2.7	46	Yes	Major	Tree is retained, most works are in the road, only minor kerb and verge works
3	High	6.6	2.7	48	Yes	Major	
4	High	5.4	2.6	0	No	None	No TPZ encroachment

5.6 TPZ Impact Discussion

Despite the TPZ encroachment percentages, all trees can be retained as part of the works (Figure 3).

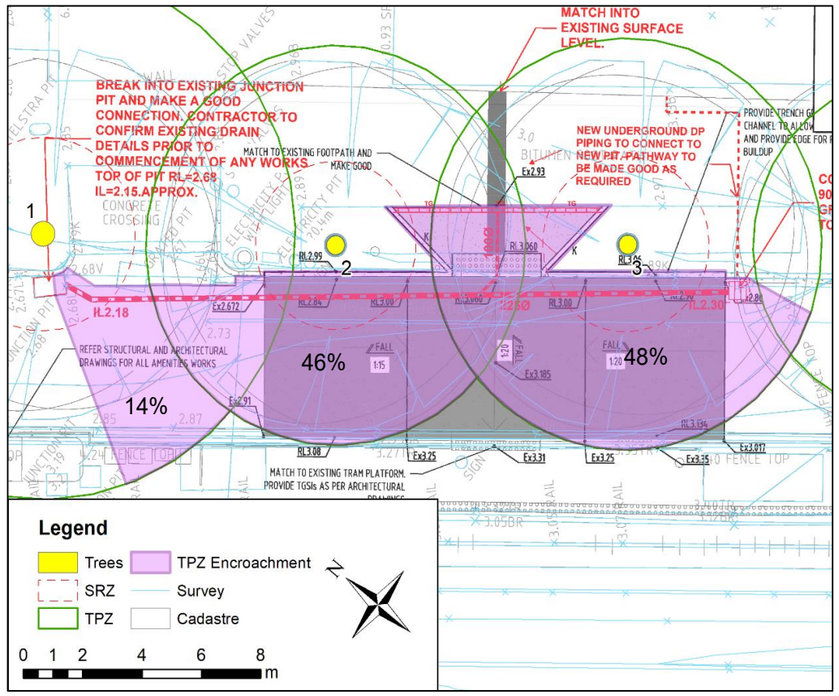


Figure 3: TPZ encroachment from the proposal.

5.6.1 Tree 1

Tree 1 will only have TPZ encroachment within the existing roadway (Figure 3). A drainage pipe is proposed to run down the road and tie into the existing pit that is at the base of the tree.

Empirical evidence suggests that there tends to be very few roots located under roads. The compaction, lack of oxygen and water all make for an inhospitable rooting environment. Excavation for the drainage will result in no impact to the tree.

A project arborist must be on-site for the drainage excavation to ensure there is no potential for damage to unexpected roots.

5.6.2 Trees 2 & 3

Drainage will be constructed and run down the road, similar to Tree 1, this will have no impact to the trees (Figure 3).

The construction of the raised, asphalt crossover will be over existing, impermeable asphalt and have no net change to the soil and rooting conditions beneath (Figure 4). This will have no impact to the trees.

The kerb will require removal and reinstatement, a process that has significant potential to impact trees. In order to minimise any potential risk for tree damage, the following must be adhered to:

1. The existing bluestone kerb is to be removed carefully using an excavator with 'pick' or single tine ripper attachment. In this way the bluestone pitchers can be removed one at a time near the trees and avoid any root damage.
2. Excavation behind the 'back of kerb' is to be avoided as much as possible. Only the minimum amount required for formwork is to be excavated. A kerb machine must not be used.
3. Removal of bluestones and any excavation must be supervised by a project arborist.

The timber edging for the new section of path must be excavated by hand and not deeper than 150mm. There is to be no excavation within the area proposed for asphalting. All works for the timber edging, asphalting and installation of drainage within the verge must be supervised by the project arborist.

Any root pruning that is required must be completed by the project arborist and in accordance with AS4373-2007 *Pruning Amenity Trees*. If any roots are uncovered that require pruning which may affect tree health, the works are to stop until there is a satisfactory resolution.

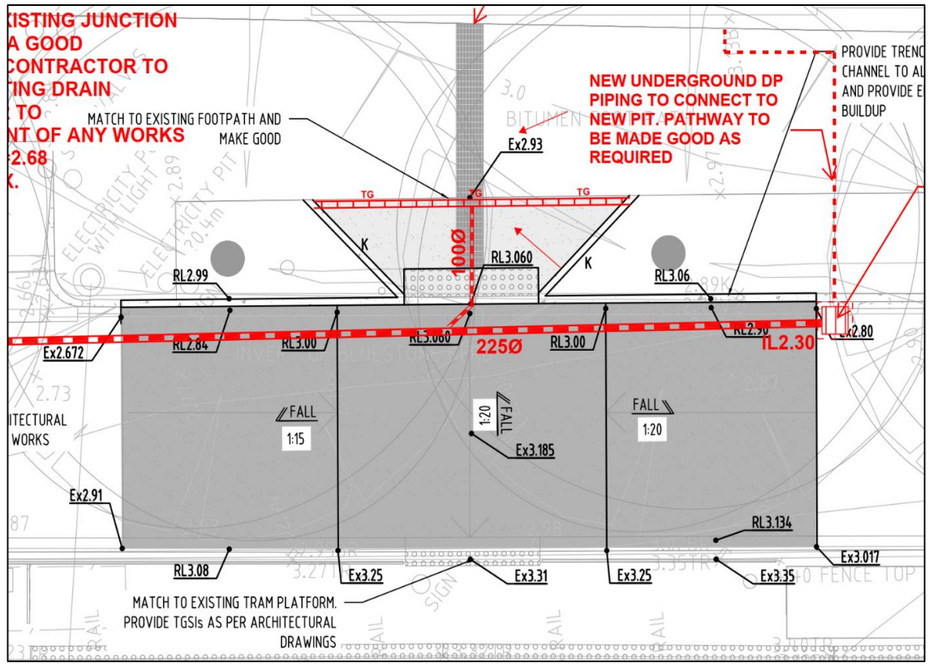


Figure 4: Proposed works on the verge.

5.7 Tree Protection

There is no scope for installation of Tree Protection Fencing given there is a public footpath and road and the restricted nature of the site. As such the following is proposed:

1. The permeable areas around Trees 2-4 that will not be impacted are to be cordoned off with flagging, parawebbing or the ground covered with ground protection boards.
2. The project arborist is on-site for all excavation to ensure there is no damage to roots or the trunk/canopy from the excavator operations. This includes:
   a. The existing bluestone kerb to be removed carefully using an excavator with 'pick' or single tine ripper attachment. In this way the bluestone pitchers can be removed one at a time near the trees and avoid any root damage.
   b. Excavation behind the 'back of kerb' is to be avoided as much as possible. Only the minimum amount required for formwork is to be excavated. A kerb machine must not be used.
   c. Excavation for timber edging and small diameter drainage through the verge.
   d. Excavation for the drainage down the road.
3. If any roots are encountered, they are to be pruned in accordance with AS4373-2007 *Pruning Amenity Trees*.
4. If roots are uncovered that, in the opinion of the project arborist, are likely to cause tree decline if cut, works are to cease until there is a satisfactory resolution.

6. Conclusion

C&R Ryder Consulting was engaged to complete an assessment of the trees along Park Street, St Kilda in proximity to proposed upgrades works near the tramstop.

4 trees were assessed, all are mature Dutch Elm *Ulmus ×hollandica* that have historically been pruned under power lines. All trees have good to fair health and fair structure with long useful life expectancies.

The following is proposed:

- Installation of new raised pavement for access to the tram platform
- Drainage along Park Street to tie into and existing pit
- New, raised footpath to tie the existing footpath to the raised kerb crossing
- Remove and replace kerb along Park Street.

The majority of the works will be completed within the road surface and as such are not expected to impact trees. Works are proposed near Trees 2 & 3 that have potential for tree damage.

Protection works proposed to ensure the trees remain viable are as follows:

1. The permeable areas around Trees 2-4 that will not be impacted are to be cordoned off with flagging, parawebbing or the ground covered with ground protection boards.
2. The project arborist is on-site for all excavation to ensure there is no damage to roots or the trunk/canopy from the excavator operations. This includes:
   a. The existing bluestone kerb to be removed carefully using an excavator with 'pick' or single tine ripper attachment. In this way the bluestone pitchers can be removed one at a time near the trees and avoid any root damage.
   b. Excavation behind the 'back of kerb' is to be avoided as much as possible. Only the minimum amount required for formwork is to be excavated. A kerb machine must not be used.
   c. Excavation for timber edging and small drainage through the verge
   d. Excavation for the drainage down the road.
3. If any roots are encountered, they are to be pruned in accordance with AS4373-2007 *Pruning Amenity Trees*.
4. If roots are uncovered that, in the opinion of the project arborist, are likely to cause tree decline if cut, works are to cease until there is a satisfactory resolution.

7. References

AS 4970, 2009, *Australian Standard, Protection of Trees on Development Sites*, Standards Australia.

Coder, K. D., 1995, 'Tree quality BMPs for developing wooded areas and protecting residual trees', in *Trees and Building Sites, Proceedings of an International Workshop on Trees and Buildings,* Edited by G. W. Watson and D. Neely, International Society of Arboriculture, Champaign, Illinois.

Appendix 1. Tree Assessment Descriptors

1.1 Image of tree

Digital image captured on the day of assessments.

1.2 Botanic Name/Common Name

The tree identified to genus and species level as well as the generally accepted common name for the tree.

1.3 Tree Dimensions

The height and width of the tree as estimated by the arborist in whole metres.

1.4 Diameter at Breast Height

The trunk diameter of the tree measured with a diameter tape at 1.4m above ground level.

1.5 Diameter at Base

The trunk diameter of the tree measured with a diameter tape above the root flare.

1.6 Health

Very Good	The tree is demonstrating exceptional growth for the species, has a full, dense canopy and there is no sign of any pest or disease**.**
Good	The tree is demonstrating good growth for the species with respect to its location and broader context. The canopy is full and complete and there are no signs of pest of disease.
Fair	The tree may have shown a reduction in optimal growth and/or there may be some twiggy deadwood within the canopy. There may be the presence of some pests or diseases that are not causing a significant decline in the tree
Poor	The tree is in decline with little growth. There may be sections of the canopy missing and pests or diseases may be prevalent
Very Poor	The tree is in significant decline, with large sections of the canopy dead. This tree is very unlikely to recover.
Dead	The tree is dead

1.7 Structure

Good	The tree's structure is typical of the species with no significant hazards such as included bark, trunk decay, splits or tears. In general, there will be a single trunk with scaffold and/or subordinate branches that display good attachments
Fair	There may be minor defects in the canopy, but the overall tree is still relatively free of significant issues. The tree may need minor pruning to fix minor defects. The canopy will by mostly symmetrical and typical of the species.
Poor	The tree will have 1 or more significant defect that may be able to be remedied with pruning. This tree is likely to have an atypical canopy and may contain defects such as included bark or codominant stems.
Very Poor	The tree has substantial defects associated with its primary trunk and scaffold structure that cannot be remedied with pruning or other measures. It is likely that this tree will require removal in the short term.
Hazardous	The tree has major defects and is likely to fail. It should be removed as soon as possible.

1.8 Useful Life Expectancy

20+	The tree is a healthy specimen in good condition. It is expected to provide a contribution to the landscape for at least another 20 years with an appropriate level of management.
10-20 years	The tree is a reasonably healthy specimen in good or fair condition. It is expected to provide a contribution to the landscape for 10-20 years with an appropriate level of management.
5-10 years	The tree is in fair condition or a short lived species. It is likely to provide contribution to the landscape for 5-10 years with an appropriate level of management at which point removal may need to be considered.
1-5 years	The tree is a poor specimen in decline and is likely to require removal within 1-5 years.
0 years	The tree is either dead or has substantial defects requiring its removal in the short term.

1.9 Tree Significance

Highly Significant	The tree is a large, mature example of the species, generally in fair to good condition. It may be a remnant specimen or have substantial habitat value. The tree may have specific landscape context or be very prominent in the broader environment. This tree may be suitable for inclusion on a significant tree register at local or state government level. Significant efforts should be made to retain this tree.
Significant	The tree is a mature example of the species in good condition and/or have particular prominence in the landscape. There may be evidence of the tree being used as a habitat tree by local fauna and/or it may be a remnant specimen. It has a long ULE and should be considered for retention. The loss of the tree may have a significant impact on the surrounding landscape.
Moderately Significant	The tree is a semi mature to mature example of the species in good condition, may be well sited in the landscape and/or may have habitat value. The removal of this tree would be noticed in the landscape.
Low	The tree is generally a smaller specimen or may be in decline. It is not located in a prominent position and its removal would have little impact on the broader landscape.
None	The tree is considered insignificant and its loss would go unnoticed.

1.10 Tree Retention

Very High	The tree is an outstanding example of the species and it should be retained at all costs.
High	The tree is a mature specimen in fair to good condition with a ULE of at least 10 years, is suitable to the site and should be retained in a new development.
Moderate	The tree is a semi-mature or mature specimen, in fair to good condition that is suitable for retention; however, is located such that its loss would not have a significant impact on the landscape.
Low	The tree is likely to be juvenile or in decline and could be retained; however, design changes are not considered worthwhile to retain a tree in this category.
None	The tree should be removed irrespective of a design as it is in severe decline, hazardous or dead.
Third Party Tree	This tree is located off the subject property and is owned by a third party. The assessment of health and structure is considered irrelevant as the tree must be retained.

Appendix 2. Tree Protection

2.1 Tree Protection Zones

It is important when considering development or construction that assets to be retained are properly protected. In this case the trees are the assets and require protection if they are to be retained in the landscape long-term. Damage to the trees can come in 1 of 2 ways. The first is immediate damage directly to the tree in the form of root severance, breaking of branches and wounding of the trunk. The second is more insidious and can take some time to manifest. This is a more indirect form of damage and usually relates to modification of soil structure or grade, drainage patterns or hydrology (Coder 1995).

Trees can be easily protected from development by the installation of Tree Protection Zones (TPZ). TPZs have been calculated according to AS4970-2009 *Protection of Trees on Development Sites* for all trees to be retained. This calculates the TPZ radius by multiplying the trunk DBH by 12 to a maximum of 15m radius. These figures have been supplied in section 4 Tree Details.

A tree protection fence should be designed to be robust and withstand easy movement or ingress. Chain mesh fencing, temporary fencing panels or solid hoarding are all good examples (Figure 5).

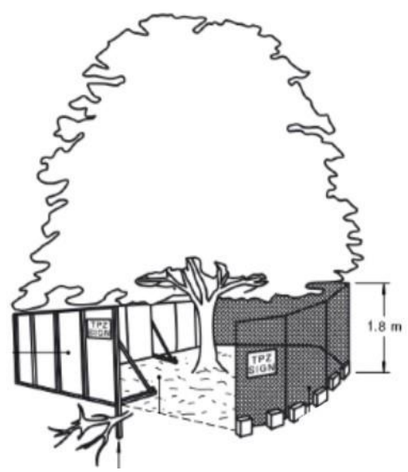


Figure 5: Indicative TPZ construction

Figure 6: Suitable TPZ signage to be displayed on TPZ fences

The following should be <u>prohibited</u> within a TPZ (adapted from AS 4970-2009):

- built structures or hard landscape features (i.e. paving, retaining walls)
- materials storage (i.e. equipment, fuel, building waste or rubble)
- soil disturbance (i.e. stripping or grade changes)
- excavation works including soil cultivation(specifically surface-dug trenches for underground utilities)
- placement of fill
- lighting of fires
- preparation of chemicals, including preparation of cement products

- pedestrian or vehicular access (i.e. pathways).

Include the following procedures in setting up and maintaining any TPZ (adapted from AS 4970-2009):

- erect warning signs at regular intervals along the entire length of any protective TPZ fencing (Figure 6)
- construct TPZ fencing to prevent pedestrian access into the protected area.
- mulch the TPZ area to a depth of 100mm with woodchips (if available, use woodchips generated from on-site tree clearing).
- irrigate TPZs periodically, as determined by the consulting arborist.

2.2 Structural Root Zones (SRZs)

The structural root zone is a formula to define the theoretical volume of soil and tree roots required to keep a tree stable in the ground. It is in no way related to tree health and significant excavation at or near the SRZ for many trees will cause severe decline and/or death.

Excavation within SRZs can lead to whole tree failure often with devastating results. SRZs have been calculated in accordance with AS 4970-2009 *Protection of Trees on Development Sites* using the equation:

$$R_{srz} = (D \times 50)^{0.42} \times 0.64$$

Where D=trunk diameter at base in metres.

These figures have been supplied in section 4 Tree Details.

2.3 Encroachment

Encroachment of less than 10% of the TPZ and outside the SRZ is deemed to be minor encroachment according to AS 4970-2009. See Figure 7. Variations must be made by the project arborist considering other relevant factors including tree health, vigour, stability, species sensitivity and soil characteristics.

Encroachment of more than 10% of the TPZ or into the SRZ is major encroachment. The project arborist must demonstrate that the tree(s) would remain viable. This may require root investigation by non-destructive methods and consideration of relevant factors tree health, vigour, stability, species sensitivity and soil characteristics.

In any case, the lost TPZ should be compensated and be contiguous with the existing TPZ.

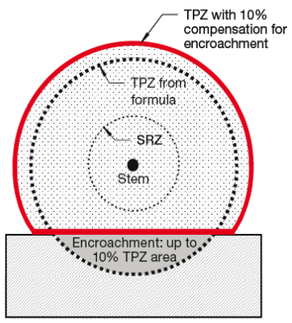


Figure 7: Example of TPZ encroachment and compensatory offset (image from AS 4970-2009)