

Tree assessment & management plan Proposed fence works Eildon Road Children's Centre 17 Eildon Road, St Kilda



23rd April 2021 | Tree Logic Ref. 011520

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1. Introduction

Overview

Treelogic was engaged to undertake an arboricultural assessment and prepare a report for trees located within and adjacent to the Eildon Road Children's Centre at 17 Eildon Road, St Kilda (subject site). The report has been requested to inform design development for proposed perimeter fence and gate works of the site. Requirements of the arboricultural report include:

- Providing information on the species, origin, dimensions, health and structure of the trees and their appropriateness for retention.
- Determine the Tree Protection Zones (TPZ) for trees compliant with *AS 4970-2009 Protection of trees on development sites (Reconfirmed 2020)*.
- Recommendations for tree management, protection measures and sympathetic construction techniques to reduce any impacts on retained trees.

Additional tree impact assessments or comment may be required during the proposed works.

2. Method

A site inspection was carried out on 8th April 2021. The trees were inspected from the ground and observations were made of the growing environment and surrounding area. The trees were not climbed, and no samples of the tree or soil were taken.

Observations were made of the assessed trees to determine the species, age category, and condition with measurements taken to establish tree crown height (measured with a height meter) and crown width (paced) and trunk dimensions (measured 1.4 metres above ground level with a diameter tape unless otherwise stated). Descriptors used in the assessment can be seen in Appendix 3.

Assessment details of individual trees are listed in Appendix 1 and a copy of the tree location plan can be seen in Appendix 2.

The site falls within the Port Phillip Planning Scheme and is zoned General Residential Zone – Schedule 1 (GRZ1). The subject site is not covered by any overlays with tree regulations.

A permit is required to prune or remove a significant tree or palm under the City of Port Phillip Community Amenity Local Law No.1, Clause 44. A Significant Tree means a tree or palm on private land:

- With a trunk circumference of 150 centimetres or greater measured 1 metre from the base.
- A multi-stemmed tree where the circumference of its exterior stems equals or is greater than 1.5 metres when measured 1 metre from its base.

Each of the assessed trees was attributed an arboricultural rating. The arboricultural rating correlates the combination of tree condition factors (health and structure) with tree amenity value. It should be noted that the arboricultural rating is different to the conservation/ecological values placed on trees by other professions. Definitions of arboricultural ratings can be seen in Appendix 3.

The assessed trees have been allocated tree protection zones (TPZ) as per the methods outlined in the *Australian Standard AS 4970 Protection of trees on development sites*. The AS 4970 has been used as a guide in the allocation of TPZs for the assessed trees. This method provides a TPZ that addresses both the stability and growing requirements of a tree. TPZ distances are measured as a radius, from the centre of the trunk at (or near) ground level. All TPZ measurements for retained trees are provided in Appendix 1. The TPZ distances are a guide and other existing site conditions, and tree attributes will inform tree protection areas.

Viewed plans:

- Perkins Architects. Fencing compliance – Eildon Road. City of Port Phillip. 17 Eildon Road, St Kilda. Existing site plan/demolition. Date: 11/12/20. 1.01 C1.
- Perkins Architects. Fencing compliance – Eildon Road. City of Port Phillip. 17 Eildon Road, St Kilda. Proposed site plan. Date: 5/2/21. 1.02 C3.
- Adams. Eildon Road Childcare Centre. 17 Eildon Road, St Kilda. VIC, 3182. Project number. 200358. Drawing number. S002. Revision. REV A. 18/12/2020
- Adams. Eildon Road Childcare Centre. 17 Eildon Road, St Kilda. VIC, 3182. Project number. 200358. Drawing number. S003. Revision. REV A. 18/12/2020

3. Observations

Nine trees were assessed and included in this report. Details of the trees can be seen in Appendix 1. The indicative location of the assessed trees with corresponding tree numbers can be seen in Appendix 2.

The trees comprised a mixture of exotic and Australian native species that, in general, were displaying growth characteristics considered typical of the species growing in this area of Melbourne under current pervading climatic conditions. Four of the assessed trees were located within the Eildon Road Children's Centre; three in the front setback and Tree No. 1 Peppercorn Tree (*Schinus areira*) was a large tree located in the rear setback.

Tree No. 9 was a Chinese Elm (*Ulmus parvifolia*) located in the rear setback of 1 Inverleith Court, adjacent to the southern boundary (common boundary with the subject site).

Tree No. 5 was a maturing Lilly Pilly (*Syzygium smithii*) located in the front setback of 15 Eildon Road, adjacent to the northern boundary (common boundary with the subject site).

There were three street trees assessed: two semi-mature Pin Oaks (*Quercus palustris*) in Inverleith Court and a Norfolk Island Hibiscus (*Lagunaria patersonia*) in Eildon Road.

The trees were attributed with an arboricultural rating and the majority had moderate ratings, other than Tree No. 4 Sticky Hop Bush (*Dodonaea viscosa*), which was rated as low due to decline.

4. Tree management in relation to proposed works

Proposed works and tree protection distances

There is a proposal to undertake perimeter fencing works to comply with National Regulations (Regulation 104). Specifically, any outdoor space used by children must be enclosed by a fence or barrier that is of a height and design that children of preschool age or under cannot go through, over or under.

The increase in height of the new fencing, and the associated footings, and the proximity of some fencing and retaining walls to existing trees has the potential to impact on trees within and adjacent to the Eildon Road Children's Centre.

There are several fence types requiring different construction methods: modified brick pier boundary fence for the front, new 2.1 m high timber paling fence over concrete sleeper retaining wall on northern boundary, and new 2.1 m tall paling fence on the southern boundary.

According to viewed plans the retaining wall on the common boundary with 1 Inverleith Court is being replaced with reinforced concrete sleepers placed between H beams set into 450 mm diameter footings, 2000 mm deep and at minimum 2000 mm centres. The area of the post footing is approximately 0.63 m².

The footing pads for the post extensions to be affixed either side of the pillars of the existing front masonry fence are 600 mm by 600 mm with a depth to be defined by the builder based on the existing strip footing. Dowels are specified to join the new concrete footing to the existing footing. The concrete pad footings would be approximately 0.36 m² in area, however, there is a requirement for additional excavation to allow the powered tools to drill the holes for the dowels.

The proposed new fences are on existing alignments with no changes to existing soil levels. The perceived impacts to the existing trees will come from the new, generally larger footings and the construction activity required to install the fences.

In order to protect and sustain trees during development, consideration must be given to protecting the tree root areas. This requires the allocation of tree protection zones for retained trees. AS4970 has been used as a guide in the allocation of tree protection zones (TPZs) for the assessed trees.

The tree protection zone (TPZ) and structural root zone (SRZ) are listed for the individual trees in Appendix 1 and indicated on the plan in Appendix 2. These distances should guide the design, however as listed in

clause 3.3.4 TPZ encroachment considerations in AS4970, the tolerance of the tree species to root disturbance, the trees condition and the presence of existing structures, as well as incorporating sensitive construction measures, such as discontinuous footing systems, can be considered in allocating an appropriate tree protection area.

Encroachment into the TPZ is permissible under certain circumstances though is dependent on both site conditions and tree characteristics (as indicated in AS4970 clause 3.3.4). Minor encroachment, up to 10% of the TPZ area, is generally permissible. Ideally, this loss of area should be compensated for by recruitment of an equal area contiguous with the TPZ. The 10% encroachment on one side only equates to a reduction of approximately $\frac{1}{3}$ radial distance. Dependent on the number and size of the nominated footings, the collective encroachment of isolated excavations for the installation of footings may also constitute less than 10% of total TPZ area. Encroachment greater than 10% is considered major encroachment under AS4970 and is only permissible if it can be demonstrated that after such encroachment the tree would remain viable.

A SRZ comprises the area around the base of a tree where structural roots required to maintain the tree's stability in the ground are typically located. The SRZ is calculated using the formula provided in AS 4970. The woody root growth and soil cohesion in this area are necessary to hold the tree upright.

It is important to note that the SRZ relates to a tree's structural stability only. Severing or damaging larger roots close to the base of the tree can also impact the tree's vitality and long-term viability.

Due to the use of isolated footings for the fence construction the total tree protection area encroached will be generally minor. Of particular concern is the encroachment of new footings and associated excavations into the structural root zone of a retained tree. This has the possibility to undermine the structural stability of a tree and increase risk potential.

Priority for tree protection (in order of priority):

1. Implement the TPZ distances.
2. Allow minor encroachment (no more than 10% of total TPZ area).
3. Implement the SRZ as a minimum tree protection distance. This distance must not be encroached.

The SRZ must be considered the minimum tree protection distance. If the proposed excavation/construction works encroach on the SRZ alternative management approaches including design modifications are to be investigated. If design modifications cannot be achieved, and tree management, such as crown pruning, cannot sustain the tree, then consideration should be given to the removal of the tree.

Note that the area of disturbance within an allocated TPZ must include all areas that will be disturbed by the proposed work, including the areas required for over-dig, stockpiling, construction traffic, vehicular access and construction staging.

Existing infrastructure, such as buildings, walls and hard surfaces, may also inform design. Tree root growth is opportunistic and occurs where the essentials to life (primarily air and water) are present. Heterogeneous soil conditions, existing barriers, hard surfaces and buildings may have inhibited the development of a symmetrically radiating root system. Existing infrastructure around some trees may be within the TPZ or

SRZ of a tree. The roots of some trees may have grown in response to the site conditions and therefore if existing hard surfaces and structure alignments are utilised in new designs the impacts on the trees should be minimal. This is relevant for the installation of new fencing where new posts should be placed within the existing post holes and alignments (albeit some of the post holes will need to be larger).

Perceived impacts and tree management requirements

Tree No. 1 Peppercorn tree

Peppercorn Trees have very good tolerance of drought, root disturbance, compaction and site wide changes.

The proposed northern 2.1 m high timber paling fence over concrete sleeper retaining wall will be approximately 6.5 metres from the centre of the trunk. The new 2.1 m paling fence to the south will be approximately 4.5 metres from the trunk. These distances are outside of the SRZ (3 m) and the overall encroachment area in the TPZ is less than 10% of total TPZ area (which for the Peppercorn Tree is approximately 277.6 m²).

The proposed fencing works will have negligible to minor impacts on Tree No. 1.

The perceived minor impacts can be sustained by this tree. No specific tree management is required.

Tree No. 2 Judas Tree (*Cercis siliquastrum*)

The proposed new modified brick pier boundary fence will be approximately 1.75 metres from the trunk of Tree No. 2. The SRZ of Tree No. 2 is 1.9 m. Note that the location of the tree on the survey plan may not be correct. The survey plan shows the tree approximately 2.4 m from the fence, whereas the fence is approximately 1.75 m from the edge of the trunk.

Consequently, the footing pads for the post extensions may encroach into the SRZ.

Any excavation works for the front masonry fence must be outside of the SRZ for Tree No. 2. If this cannot be achieved, non-destructive root investigation should occur at the intended location of the post footings to ascertain the extent of roots and any ramifications. Non-destructive excavation techniques include hand digging, compressed air soil displacement or Hydrovac® excavation. To avoid doing excessive damage to tree roots, when using Hydrovac®, pressure is to be set to the lowest pressure (which is usually 16L per minute or 1400 psi, however, some trucks/equipment will not have this capability). The non-destructive excavation techniques will uncover any significant roots (30 mm or greater in diameter). If such roots are exposed, they are to be left intact and the tree would need an inspection by an arborist to determine the impacts on the tree if the root(s) were to be cut to contain the new footing.

Tree No. 3 Bracelet Honey Myrtle (*Melaleuca armillaris*)

The existing front fence is close to the base of this tree; less than 0.5 m from fence pillars and 0.34 m to the pillar next to the gate. The SRZ for the Bracelet Honey Myrtle is 2.5 m. Any works, as outlined in the Adams Drawing number S003, would potentially impact on roots within the SRZ of Tree No. 3.

Based on the proposal, there are not many options that could be utilised to avoid impacting the tree. Fixing the steel posts extensions to the existing pillars would offset the requirement for excavation, however, this may not meet the engineering requirements for fence stability.

Unless design modifications to the proposed fence extension can be implemented to avoid any excavation within the SRZ, then the tree should be considered for removal (a permit would be required as the tree is greater than 150 cm circumference at the base).



Figure 1. Shows Tree No. 3 Bracelet Honey Myrtle in the landscape and right shows the location of the base of the tree to the existing fence.

Tree No. 4 Sticky Hop Bush (*Dodonaea viscosa*)

The Sticky Hop Bush is proposed to be removed (no permit is required as the base of the tree is less than 150 cm circumference). This small tree/large shrub was exhibiting some decline symptoms.

No further comment is required on this tree.

Tree No. 5 Lilly Pilly (*Syzygium smithii*)

The Lilly Pilly was located in the front setback of 15 Eildon Road, 0.5 m off the existing paling fence (common boundary).

The SRZ for the Lilly Pilly is 3.1 m.

No works are proposed adjacent to this tree and therefore doesn't warrant any further comment.

Tree No. 6 Norfolk Island Hibiscus (*Lagunaria patersonia*) – street tree in Eildon Rd.

The edge of the trunk of the Norfolk Island Hibiscus is approximately 3.0 m from the existing front fence. The SRZ for Tree No. 6 is 2.4 m.

Any excavation works for the front masonry fence are outside of the SRZ for Tree No. 6 and will only be minor encroachment into the TPZ.

No specific tree management is required.

Tree Nos. 7 & 8 Pin Oaks (*Quercus palustris*) – street trees in Inverleith Crt.

The edge of the trunk of the Pin Oaks are approximately 2.7 m from the existing front fence. The TPZ for the two trees is 2.0 m.

The two Pin Oak street trees will not be impacted by the proposed fence modification. No specific tree management is required.

Tree No. 9 Chinese Elm (*Ulmus parvifolia*)

The base of trunk of the Chinese Elm is 0.34 m from the existing retaining wall. The SRZ for the Chinese Elm is 2.5 m. Any works, as outlined in the Adams Drawing number S002 Rev A, has the potential to impact on roots within the SRZ of Tree No. 9.

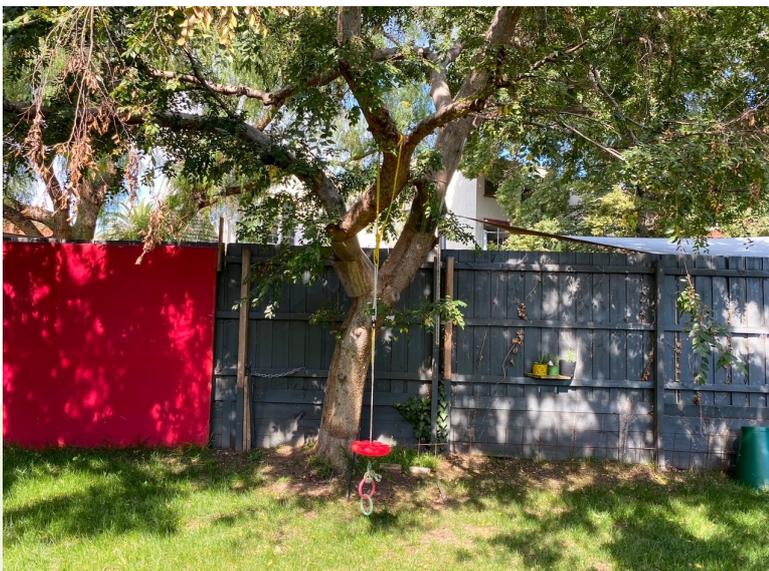


Figure 2. Above left shows Chinese Elm in the landscape. Above right shows the location of the trunk in relation to the existing wall. Note lean to the north. Left shows more detail of existing wall/fence in relation to the Chinese Elm.

There is a high likelihood that roots would have grown under the existing wall and up into the rear of 17 Eildon Road. These roots will be assisting in tree stability. The tree also leans towards the north and the canopy weight is biased to the north and away from the wall.

Any major root disturbance (removing or damaging existing roots or even affecting the root/soil interaction) on the south side of the Chinese Elm has the potential to impact the tree's viability, but also more importantly, could destabilise the tree.

In this case, based on an understanding of root morphology and growth, there is an assumption that major roots could be impacted by the proposed retaining wall works. Consequently, a non-destructive root investigation would not have any real benefit or enlighten management decisions.

As far as is practicable, the roots within the allocated SRZ should be preserved. The proposed new retaining wall should emulate existing conditions as far as is achievable with no additional excavation within the SRZ. This includes any excavation works on the 17 Eildon Road side of the wall, such as back of wall drainage. As an alternative to back of wall drainage, is it possible to have weep holes in the SRZ section (approximately 4.8 m length).

Any foundations must be located outside of the SRZ. The distance between the piers must be spanned by a structural component that is placed above the existing grade within 1 Inverleith Court. The structural component could be bedded into the topsoil, after the removal of the organic matter layer (no more than 50 mm depth). See Figure 3 for an indicative design for spanning a root zone with a fence.

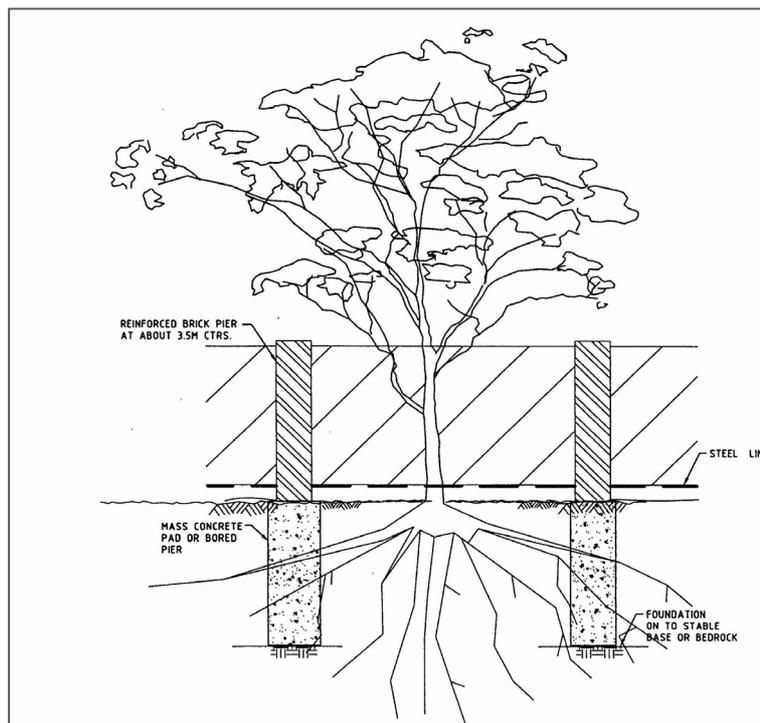


Figure 3. Indicative design for spanning a root zone with a fence structure.

Within the SRZ distance of the tree, utilise existing back of wall drainage if present and still functioning. If new drainage is required, consideration should be given to weep holes in the SRZ section of the wall.

- The proposed footings for the H beam posts must be placed outside of the SRZ.

- Under no circumstances shall trenching occur within the TPZ to install the retaining structures.
- Excavation for any footings or ground levelling must be excavated by hand or powered tools.
- Location of piers / footings must remain flexible to avoid roots ≥ 50 mm \varnothing when identified by an arborist. No roots ≥ 50 mm \varnothing shall be severed unless authorized by the arborist.

General tree management considerations

Demolition

Limited manual excavation within the TPZ for the removal of existing fence posts and retaining wall is acceptable. Such excavation should be undertaken carefully, using hand-held tools and preferably by non-destructive excavation techniques such as compressed air soil displacement or Hydrovac® excavation (This may also expose the extent of roots within the expanded post footings).

Tree sensitive construction techniques

Under clause 3.3.4 *TPZ encroachment considerations* of AS 4970, design factors such as tree sensitive construction measures for example pier and beam, suspended slabs, cantilevered building sections, screw piles and contiguous piling can minimize the impact of encroachment.

When siting a structure near to a tree, the future growth of the tree, both above and below ground should be considered. Provisions should be made at the planning and design stage to minimize potential conflict between trees and new structures.

Excavation equipment and techniques (demolition and construction)

It is assumed that most of the works will be undertaken by hand digging or powered hand tools.

If excavation equipment is required, the contractor is to use the smallest equipment possible to complete the work. A rubber tracked mini digger (maximum weight of 2.5 tonnes) may be used within a TPZ. Wheeled trucks carrying materials or equipment and removing spoil must not encroach or traverse the allocated TPZ of any retained tree without appropriate ground protection systems installed.

Appropriate ground protection must be installed where vehicle or plant are anticipated to cross the TPZ of any retained trees to disperse the load within the TPZ area. Ground protection systems for traffic pathways within any allocated TPZ must be temporary and formed at or above existing soil levels. An example of a ground protection system can be seen in clause 4.5.3 *Ground protection* of AS4970.

Spoil must not be built up or stored within the allocated TPZ (modified or optimum) of any tree.

If the TPZ is encroached and roots are damaged/severed (roots equal to or greater than 50 mm in diameter, dependent on size of the tree), then the project arborist will undertake a tree inspection and assessment to recommend remedial works.

Root pruning

How to determine the diameter of a significant root

The size of a significant root will vary according to the distance of the exposed root to the trunk of the tree, and in some instances, the species of tree. Generally, the further away from the trunk of a tree that a root is, the less significant the root is likely to be to the tree's health and stability.

The determination of what is a significant root is often difficult because the form, depth and spread of roots will vary between species and sites. However, because smaller roots are connected to larger roots in a framework, there can be no doubt that if larger roots are severed, the smaller roots attached to them will die. Therefore, the larger the root, the more significant it may be.

Table 1 indicates the size of tree roots that would be deemed significant compared to the height of the tree.

A significant root for trees 2 and 3 is considered to be 30 mm diameter or greater. Roots equal to or greater than 50 mm are deemed to be significant for Tree Nos. 1 and 9. Significant roots are to be left intact and hand dug around to expose if necessary. The works (post footing) may need to be shifted to retain the uncovered significant roots or if this is not possible the consultant arborist should inspect the root to ascertain the impacts on the tree.

Table 1 Estimated significant root sizes outside SRZ

Height of tree	Diameter of root
Less than 5m	More than 30mm
Between 5m - 15m	More than 50mm
More than 15m	More than 70mm

If tree significant roots are encountered, if approved, they should be cut using a sharp axe, pruning saw or chainsaw with the aim of creating the smallest possible wound. The smallest wound will often be created if the cut is made at right angles or 90 degrees to the direction of the root. Roots should be cut as far away from the stem or trunk as possible.

If roots are exposed during excavation, works should stop and the roots should be pruned to provide sufficient clearance from the excavation machinery, before works continue.

Freshly pruned roots should not be painted with any product. However, if freshly cut roots are expected to be left exposed for more than 24 hours, they should be covered with wetted hessian until the soil is replaced.

Tree pruning

The assessed trees may require pruning to attain the canopy clearances to the new fences.

Any pruning must comply with Australian Standard *AS4373-2007 Pruning of amenity trees*. Remove any major deadwood (>25mm diameter) while undertaking the pruning on the trees. Council may need to be notified of the intent to prune a Council asset. Council's Open Space and Recreation Services may wish to undertake the pruning.

Further tree management

Additional tree impact assessments or comment may be required during construction, particularly if significant roots (as defined above) are uncovered during works.

Retained trees may require tree protection measures, such as the installation of ground protection systems, to minimise the impacts on the trees. Based on the intended works, tree protection fencing may not be required.

General tree protection guidelines

Preserving the soil conditions, i.e. avoid compaction, and sustaining tree roots is imperative to successful tree retention.

- There is no need for the installation of tree protection fences.
- No stockpiling of soil or other materials within the TPZ of any tree.
- No staging areas for materials or equipment within the TPZ of any tree.
- If excavation machinery is used, then it should track in a straight line through a TPZ. Limit the turning of any excavation equipment within the TPZ.

Activities that are not allowed within the TPZs of retained trees (except if approved by the project arborist) include, but are not limited to:

- Storage of equipment, and tools
- Wash-down and cleaning of equipment
- Vehicular traffic except on existing paved surfaces (to the extent that the surfaces can handle the weight of these vehicles)
- Parking of vehicles and plant
- Installation of service pits or hatches
- Permanent or temporary vehicular crossings
- Alteration of soil levels
- Refuelling
- Preparation or disposal of chemicals, including preparation of cement products.
- Temporary or permanent installation or attachment of anything on the tree itself including wires, nails, screws, or any other fixing device.

These tree protection measures must be conveyed as verbal and written instruction to all site workers.

Even with the best of intentions and application of best practice methods, there is no warranty or guarantee, expressed or implied by Tree Logic Pty. Ltd., that the problems or deficiencies of the trees or site in question may not arise in the future.

5. Conclusion & recommendations

There is a proposal to undertake fencing works around the periphery of the Eildon Road Children's Centre at 17 Eildon Road, St Kilda to comply with National Regulations (Regulation 104). The tree assessment and report are aimed at providing information to assist in the construction of the new and modified fences to avoid or reduce the impact on retained trees.

This work has the potential to impact on three of the nine assessed trees. Consideration must be given to the allocation of tree protection zones (TPZs) and the structural root zone (SRZ), which is considered the minimum tree protection distance. Severing or damaging roots within the SRZ could destabilise the tree.

As far as is practicable, new fence post alignments and locations should be similar to existing structures.

The following is recommended:

- Tree No. 2 - Any new foundation for the fence extension proposed for the front fence of the centre must be placed outside of the structural root zone (SRZ) of Tree No. 2 Judas Tree.
- Tree No. 3 - The proposed works are within the SRZ of Tree No. 3 Bracelet Honey Myrtle, which is adjacent to the front gate/entrance. Due to the location of the works to the base of the tree, there are not many tree sensitive options that could be utilised to avoid impacting the tree. Fixing the steel posts extensions to the existing pillars would offset the requirement for excavation, however, this may not meet the engineering requirements for fence stability. Unless design modifications to the proposed fence extension can be implemented to avoid any excavation within the SRZ, then the tree should be considered for removal (A permit under Local Law No. 1 would be required).
- Tree No. 9 - Due to the construction of a retaining wall within the SRZ of Tree No. 9 Chinese Elm (located on the adjoining property), substantial construction impacts could occur. The proposed foundations for the retaining wall and fence must be located outside of the SRZ. The distance between the piers must be spanned by a structural component that is placed above the existing grade within 1 Inverleith Court. No new back of wall drainage is to be installed in the SRZ area.
- Tree No. 4 Sticky Hop Bush is a low rated, declining large shrub and has been nominated for removal (no permit required).

The perceived impacts to the remaining five trees are minor to negligible and no specific management is required to see them successfully retained. The general tree management considerations listed in this report should be implemented for all retained trees.

Additional tree impact assessments or comment may be required during the construction works.

Under no circumstance shall this report be reproduced unless in full.



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Manager Consulting

References and bibliography

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Standards Australia (2007), Australian Standard (4373-2007) - Pruning of amenity trees, Standards Australia, Sydney, NSW, Australia

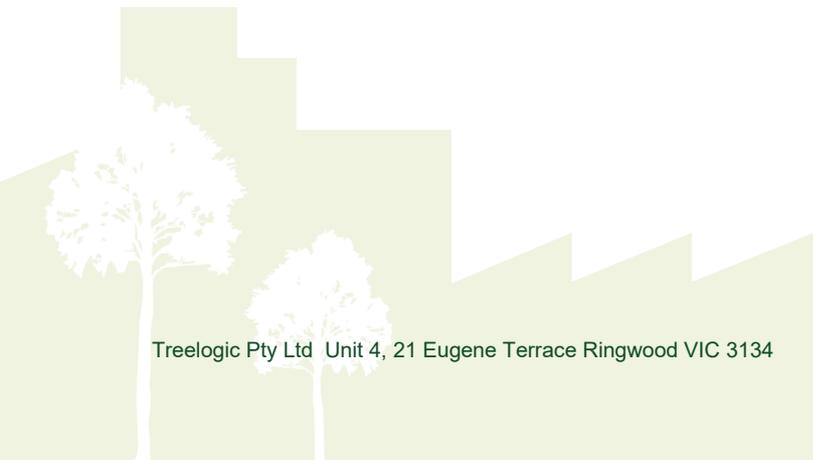
Appendix 1: Tree Numbers and Details – Eildon Road Children’s Centre. 17 Eildon Road, St Kilda

Ht x Wdth = Canopy height by width. DBH = Diameter at Breast Height (measured in centimetres at 1.4m above ground unless otherwise stated). Basal diameter is measured just above the root buttress. ULE = Useful Life Expectancy. Arb. rating = arboricultural rating. TPZ = Tree Protection Zone in metres. SRZ = Structural Root Zone in metres. TPZ & SRZ measurements are radius from the centre of the trunk. For tree location and numbering refer Appendix 2. See Appendix 3 for Tree descriptors.

Tree ID	Species	Age class	Origin/type	DBH (cm)	Basal (cm)	Ht x Wdth (m)	Health	Structure	Arb. rating	ULE (yrs)	Comments	TPZ r (m)	SRZ r (m)
1	<i>Schinus areira</i> (Peppercorn Tree)	Early-mature	Exotic evergreen	78	81	12 x 12	Fair	Fair	Mod.A	21-40	6.5 m north fence 4.5m south fence	9.4	3
2	<i>Cercis siliquastrum</i> (Judas Tree)	Maturing	Exotic deciduous	17,17	28	5 x 7	Fair	Fair to Poor	Mod.B	11-20	Codominant leaders, low attachment, included bark. 1.75m to front fence	2.9	1.9
3	<i>Melaleuca armillaris</i> (Bracelet Honey-myrtle)	Maturing	Victorian native	21,13,12,16	50	6 x 7	Fair	Fair to Poor	Mod.C	6-10	Multiple leaders, acute attachments typical of the species. Less than 0.5m from fence\pillars, 34cm to pillar next to gate.	3.8	2.5
4	<i>Dodonaea viscosa</i> (Sticky Hop Bush)	Over-mature	Australian native	23	25	4 x 5	Fair to Poor	Fair to Poor	Low	1-5	Small tree in decline. Nominated for removal. 0.34m from fence. Diameter measured at <1m.	2.8	1.8
5	<i>Syzygium smithii</i> (formerly <i>Acmena smithii</i>) (Lilly Pilly)	Maturing	Victorian native	18, 15, 13, 14, 17, 16, 10	85	8 x 7	Fair	Fair to Poor	Mod.B	11-20	0.5m off paling fence. Multiple leaders. Utilise existing post holes or either side of SRZ	4.2	3.1
6	<i>Lagunaria patersonia</i> (Norfolk Island Hibiscus)	Early-mature	Australian native	37	47	7 x 6	Fair	Fair to Poor	Mod.C	11-20	3m to fence. Street tree, pruned for P/Ls	4.4	2.4
7	<i>Quercus palustris</i> (Pin Oak)	Semi-mature	Exotic deciduous	12	20	6 x 5	Fair	Fair	Mod.A	>40	Street tree. 2.7m to fence.	2	1.7
8	<i>Quercus palustris</i> (Pin Oak)	Semi-mature	Exotic deciduous	14	22	7 x 6	Fair	Fair	Mod.A	>40	Street tree. 2.7m to fence.	2	1.8

Tree ID	Species	Age class	Origin/type	DBH (cm)	Basal (cm)	Ht x Wdth (m)	Health	Structure	Arb. rating	ULE (yrs)	Comments	TPZ r (m)	SRZ r (m)
9	<i>Ulmus parvifolia</i> (Chinese Elm)	Early-mature	Exotic deciduous	44	52	10 x 15	Fair	Fair	Mod.A	21-40	Base of trunk 0.34m from existing retaining wall. Utilise existing post or SRZ distance (whichever greater), span concrete sleepers over the root zone. No drainage in SRZ area (unless already existing).	5.3	2.5

Appendix 2: Tree Locations – Eildon Road Children’s Centre at 17 Eildon Road, St Kilda





APPENDIX 2 — TREE LOCATIONS AND PROTECTION ZONES

PROJECT
Eildon Road Children's Centre
17 Eildon Road, St Kilda

DATA SOURCES

CLIENT
City of Port Phillip

TL REF. 011520
MAP NO. 1/1
DATE 2021-04-21

LEGEND

- Arboricultural Ratings
- Mod-A
 - Mod-B
 - Mod-C
 - Low
- Protection Zones
- TPZ
 - SRZ

TREE LOCATION DISCLAIMER
Tree locations are based on feature survey

COORDINATE REFERENCE SYSTEM
EPSG: 28355 | GDA 94 MGA Zone 55

0 2 4 m

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Appendix 3 - Arboricultural Descriptors (February 2019)

Note that not all of the described tree descriptors may be used in a tree assessment and report. The assessment is undertaken with regard to contemporary arboricultural practices and consists of a visual inspection of external and above-ground tree parts.

1. Tree Condition

The assessment of tree condition evaluates factors of health and structure. The descriptors of health and structure attributed to a tree evaluate the individual specimen to what could be considered typical for that species growing in its location under current climatic conditions. For example, some species can display inherently poor branching architecture, such as multiple acute branch attachments with included bark. Whilst these structural defects may technically be considered arboriculturally poor, they are typical for the species and may not constitute an increased risk of failure. These trees may be assigned a structural rating of fair-poor (rather than poor) at the discretion of the assessor.

Diagram 1 provides an indicative distribution curve for tree condition to illustrate that within a normal tree population the majority of specimens are centrally located within the condition range (normal distribution curve). Furthermore, that those individual trees with an assessed condition approaching the outer ends of the spectrum occur less often.

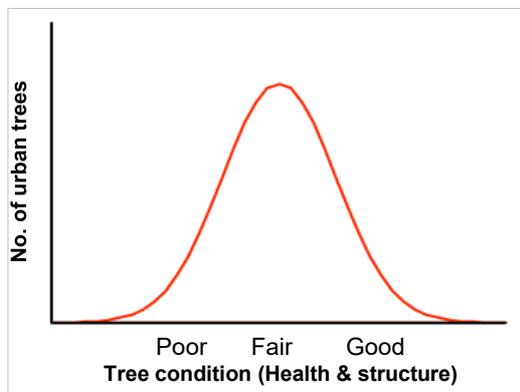


Diagram 1: Indicative normal distribution curve for tree condition

2. Tree Name

Provides botanical name, (genus, species, variety and cultivar) according to accepted international code of taxonomic classification, and common name.

3. Tree Type

Describes the general geographic origin of the species and its type e.g. deciduous or evergreen.

Category	Description
Indigenous	Occurs naturally in the area or region of the subject site. Remnant.
Victorian native	Occurs naturally within some part of the State of Victoria (not exclusively) but is not indigenous (component of EVC benchmark). Could be planted indigenous trees.
Australian native	Occurs naturally within Australia but is not a Victorian native or indigenous
Exotic deciduous	Occurs outside of Australia and typically sheds its leaves during winter
Exotic evergreen	Occurs outside of Australia and typically holds its leaves all year round
Exotic conifer	Occurs outside of Australia and is classified as a gymnosperm
Native conifer	Occurs naturally within Australia and is classified as a gymnosperm
Native Palm	Occurs naturally within Australia. Woody monocotyledon
Exotic Palm	Occurs outside of Australia. Woody monocotyledon

4. Height and Width

Indicates height and width of the individual tree; dimensions are expressed in metres. Crown heights are measured with a height meter where possible. Due to the topography of some sites and/or the density of vegetation it may not be possible to do this for every tree. Tree heights may be estimated in line with previous height meter readings in conjunction with assessor's experience. Crown widths are generally paced (estimated) at the widest axis or can be measured on two axes and averaged. In some instances, the crown width can be measured on the four cardinal

direction points (North, South, East and West).

Crown height, crown spread are generally recorded to the nearest half metre (crown spread would be rounded up) for dimensions up to 10 m and the nearest whole metre for dimensions over 10 m. Estimated dimensions (e.g. for off-site or otherwise inaccessible trees where accurate data cannot be recovered) shall be clearly identified in the assessment data.

5. Trunk diameters

The position where trunk diameters are captured may vary dependent on the requirements of the specific assessment and an individual trees specific characteristics. DBH is the typical trunk diameter captured as it relates to the allocation of tree protection distances. The basal trunk diameter assists in the allocation of a structural root zone. Some municipalities require trunk diameters be captured at different heights, with 1.0 m above grade being a common requirement. The specific planning schemes will be checked to ascertain requirements.

Stem diameters shall be recorded in centimetres, rounded to the nearest 1 cm (0.01 m).

Diameter at Breast Height (DBH)

Indicates the trunk diameter (expressed in centimetres) of an individual tree measured at 1.4m above the existing ground level or where otherwise indicated, multiple leaders are measured individually. Plants with multiple leader habit may be measured at the base. The range of methods to suit particular trunk shapes, configurations and site conditions can be seen in Appendix A of Australian Standard AS 4970-2009 Protection of trees on development sites. Measurements undertaken using foresters' tape or builders' tape.

Basal trunk diameter

The basal dimension is the trunk diameter measured at the base of the trunk or main stem(s) immediately above the root buttress. Used to ascertain the Structural Root Zone (SRZ) as outlined in AS4970.

6. Health

Assesses various attributes to describe the overall health and vitality of the tree.

Category	Vitality, Extension growth	Decline symptoms, Deadwood, Dieback	Foliage density, colour, size, intactness	Pests and or disease
Good	Above typical. Excellent. Full canopy density	Negligible	Better than typical	Negligible
Fair	Typical vitality. >80% canopy density	Minor or expected. Little or no dead wood	Typical. Minor deficiencies or defects could be present.	Minor, within damage thresholds
Fair to Poor	Below typical - low vitality	More than typical. Small sub-branch dieback	Exhibiting deficiencies. Could be thinning, or smaller	Exceeds damage thresholds
Poor	Minimal - declining	Excessive, large and/or prominent amount & size of dead wood. Significant dieback	Exhibiting severe deficiencies. Thinning foliage, generally smaller or deformed	Extreme and contributing to decline
Dead	N/A	N/A	N/A	N/A

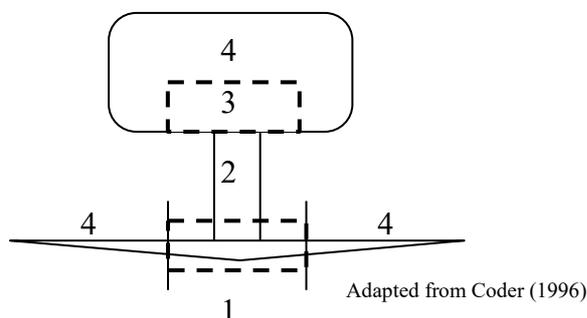
7. Structure

Assesses principal components of tree structure (Diagram 2).

Descriptor	Zone 1 - Root plate & lower stem	Zone 2 - Trunk	Zone 3 - Primary branch support	Zone 4 - Outer crown and roots
Good	No obvious damage, disease or decay; obvious basal flare / stable in ground	No obvious damage, disease or decay; well tapered	Well formed, attached, spaced and tapered. No history of failure.	No obvious damage, disease, decay or structural defect. No history of failure.
Fair	Minor damage or decay. Basal flare present.	Minor damage or decay	Generally, well attached, spaced and tapered branches. Minor structural deficiencies may be present or developing. No history of branch failure.	Minor damage, disease or decay; minor branch end-weight or over-extension. No history of branch failure.
Fair to Poor	Moderate damage or decay; minimal basal flare.	Moderate damage or decay; approaching recognised thresholds	Weak, decayed or with acute branch attachments; previous branch failure evidence.	Moderate damage, disease or decay; moderate branch end-weight or over-extension. Minor branch failure evident.
Poor	Major damage, disease or decay; fungal fruiting bodies present. Excessive lean placing pressure on root plate	Major damage, disease or decay; exceeds recognised thresholds; fungal fruiting bodies present. Acute lean. Stump re-sprout	Decayed, cavities or has acute branch attachments with included bark; excessive compression flaring; failure likely. Evidence of major branch failure.	Major damage, disease or decay; fungal fruiting bodies present; major branch end-weight or over-extension. Branch failure evident.
Very Poor	Excessive damage, disease or decay; unstable / loose in ground; altered exposure; failure probable	Excessive damage, disease or decay; cavities. Excessive lean. Stump re-sprout	Decayed, cavities or branch attachments with active split, failure imminent. History of major branch failure.	Excessive damage, disease or decay; excessive branch end-weight or over-extension. History of branch failure.

Diagram 2: Tree structure zones

1. Root plate & lower stem
2. Trunk
3. Primary branch support
4. Outer crown & roots



Structure ratings will also consider general branching architecture, stem taper, live crown ratio, crown symmetry (bias or lean) and crown position such as tree being suppressed amongst more dominant trees.

The lowest or worst descriptor assigned to the tree in any column could generally be the overall rating assigned to the tree. The assessment for structure is limited to observations of external and above ground tree parts. It does not include any exploratory assessment of underground or internal tree parts unless this is requested as part of the investigation. Trees are assessed and then given a rating for a point in time. Generally, trees with a poor or very poor structure are beyond the benefit of practical arboricultural treatments.

The management of trees in the urban environment requires appropriate arboricultural input and consideration of risk. Risk potential will consider the combination of likelihood of failure and impact, including the perceived importance of the target(s).

8. Age class

Relates to the physiological stage of the tree's life cycle.

Category	Description
Young	Sapling tree and/or recently planted. Approximately 5 or less years in location.
Semi-mature	Tree increasing in size and yet to achieve expected size in situation. Primary developmental stage.
Early-mature	Tree established, generally growing vigorously. > 50% of attainable age/size.
Mature	Specimen approaching expected size in situation, with reduced incremental growth.
Over-mature	Mature full-size with a retrenching crown. Tree is senescent and in decline. Significant decay generally present.

9. Useful life expectancy

Assessment of useful life expectancy provides an indication of health and tree appropriateness and involves an estimate of how long a tree is likely to remain in the landscape based on species, stage of life (cycle), health, amenity, environmental services contribution, conflicts with adjacent infrastructure and risk to the community. It would enable tree managers to develop long-term plans for the eventual removal and replacement of existing trees in the public realm. It is not a measure of the biological life of the tree within the natural range of the species. It is more a measure of the health status and the trees positive contribution to the urban landscape.

Within an urban landscape context, particularly in relation to street trees, it could be considered a point where the costs to maintain the asset (tree) outweigh the benefits the tree is returning.

The assessment is based on the site conditions not being significantly altered and that any prescribed maintenance works are carried out (site conditions are presumed to remain relatively constant and the tree would be maintained under scheduled maintenance programs).

Useful Life Expectancy	Typical characteristics
<1 year (No remaining ULE)	Tree may be dead or mostly dead. Tree may exhibit major structural faults. Tree may be an imminent failure hazard. Excessive infrastructure damage with high risk potential that cannot be remedied.
1-5 years (Transitory, Brief)	Tree is exhibiting severe chronic decline. Crown is likely to be less than 50% typical density. Crown may be mostly epicormic growth. Dieback of large limbs is common (large deadwood may have been pruned out). Major structural defects that cannot be remedied. Tree may be over-mature and senescing. Infrastructure conflicts with heightened risk potential. Tree has outgrown site constraints.
6-10 years (Short)	Tree is exhibiting chronic decline. Crown density will be less than typical and epicormic growth is likely to present. The crown may still be mostly entire, but some dieback is likely to be evident. Dieback may include large limbs. Structural defects present that influence the tree's risk rating, amenity or vitality. Over-mature and senescing or early decline symptoms in short-lived species. Early infrastructure conflicts with potential to increase regardless of management inputs.
11-20 years (Moderate)	Tree not showing symptoms of chronic decline, but growth characteristics are likely to be reduced (bud development, extension growth etc.). Developing structural defects that reduce viability with limited scope for management. Tree may be over-mature and beginning to senesce. Potential for infrastructure conflicts regardless of management inputs.
21-40 years (Moderately long)	Trees displaying normal growth characteristics, but vitality is likely to be reduced (bud development, extension growth etc.). Structural issues relatively minor and manageable with arboricultural input. Tree may be growing in restricted environment (e.g. streetscapes) or may be in late maturity. Semi-mature and mature trees exhibiting normal growth characteristics. Juvenile trees in streetscapes.
>40 years (Long)	Generally juvenile and semi-mature trees exhibiting normal growth characteristics within adequate spaces to sustain growth, such as in parks or open space. Could also pertain to maturing, long-lived trees. No observable major structural defects. Tree well suited to the site with negligible potential for infrastructure conflicts.

Note that ULE may change for a tree dependent on the prevailing climatic conditions, sudden changes to a tree's growing environment creating an acute stress or impact by pathogens.

The ULE may not be applicable for trees that are manipulated, such as topiary, or grown for specific horticultural purposes, such as fruit trees.

There may be instances where remedial tree maintenance could extend a tree's ULE.

10. Arboricultural Rating

Relates to the combination of assigned tree condition factors, including health and structure (arboricultural merit) and ULE, and conveys an amenity value (An amenity tree can occupy a site that complements its surroundings in a useful manner which culminates in the aid, protection, comfort and emotional response of humans. Adapted from Coder, 2004). Amenity relates to the trees biological, functional and aesthetic characteristics (Hitchmough, 1994) within an urban landscape context. The presence of any serious disease or tree-related hazards that would impact risk potential are considered.

The arboricultural rating can be used by applying only the main category high, moderate, low or very low without using the subcategories. The sub-categories can assist in differentiating a trees value and/or characteristic in more detail within the specific tree assessment context, such as a development site.

Arboricultural rating			
<i>Category</i>	<i>Description</i>		
High (colour coded – See QGIS Layer Styles Quick Guide v1.1 (14 Jan 2018))	Exemplary specimen due to multiple factors which could include good condition and vitality, large size/canopy and prominence in the landscape. Likely to be a very long-term component in the landscape with a long ULE. Other factors that could contribute to a high rating: <ul style="list-style-type: none"> • Particularly good example of the species; rare or uncommon. • Tree has visual importance as a landscape feature; provides substantial contribution to landscape character. • Tree may have significant ecological or conservation value. • *Tree has historical, commemorative or other distinct social/cultural significance. Trees in this category must be considered for retention and/or incorporated within design proposals.		
<i>Category</i>	<i>Description</i>	<i>Sub category</i>	<i>Description</i>
Moderate (colour coded – See QGIS Layer Styles Quick Guide v1.1 (14 Jan 2018))	Tree of moderate quality, in fair or typical condition. Tree may have a condition, and or structural problem that will respond to arboricultural treatment. These trees have the potential to be moderate- to long-term components of the landscape (moderate to long ULE) if managed appropriately. The sub-categories relate predominately to age, size and amenity. Trees in this category should be considered for retention and/or incorporated within design proposals.	A	Moderate to large, maturing tree. Suited to the site & contributes to the landscape character. Tree may have conservation or other cultural/social value.
		B	Moderate sized, established tree, > 50% of attainable age/size. Suited to the site & contributes to the landscape character (other attributes covered under 'Moderate' description)
		C	<ul style="list-style-type: none"> • Young to semi-mature, generally a smaller tree, established, >15 cm DBH, >5 years in the location. Not a dominant canopy. No significant qualities currently but has the potential to become a higher value tree & long-term component of the landscape. Replacement of tree is likely to take up to 6 - 10 years to attain similar attributes. • Semi- to mature tree with accumulating deficiencies and reducing ULE, trending towards Low arboricultural value.

<i>Category</i>	<i>Description</i>
Low (colour coded – See QGIS Layer Styles Quick Guide v1.1 (14 Jan 2018))	Unremarkable tree of low quality or little amenity value. Tree in either poor health and/or with poor structure. Short to transitory useful life expectancy (<10 years). <ul style="list-style-type: none"> • Tree is not prominent in the landscape due to its size or age, such as young trees with a stem diameter below 15 cm. Tree < 5 years in location. These trees are easily replaceable or capable of being transplanted. • Tree (species) is functionally inappropriate to the specific location. Is causing excessive damage/nuisance to adjacent infrastructure or would be expected to be problematic if retained (i.e. palm tree under power lines). • Unremarkable tree of no material landscape, conservation or other cultural value. Not visible from surrounding landscapes.

	<ul style="list-style-type: none"> • Tree infected with pathogens that could lead to its decline. • Tree has potential to be an environmental woody weed (may be dependent on location of tree in an urban landscape). • Tree impacting or suppressing trees of better quality. <p>Retention of such trees may be considered if not requiring a disproportionate expenditure of resources for a tree in its condition and location.</p>
Category	Description
Very low (colour coded – See QGIS Layer Styles Quick Guide v1.1 (14 Jan 2018))	<p>Trees of low quality with a brief to no remaining ULE (<5 years).</p> <ul style="list-style-type: none"> • Tree has either a severe structural defect or health problem or combination that cannot be sustained with practical arboricultural techniques and the loss of the tree or tree part would be expected in the short term. • Tree whose retention would not be viable after the removal of adjacent trees, such as trees that have developed in close spaced groups and would not be expected to adapt to severe and sudden alterations to environmental & site conditions, e.g. removal of adjacent shelter trees. • Small or young tree, <5m in height, <10cm DBH. Easily replaced in short-term or capable of being transplanted. • Acknowledged environmental woody weed species. Tree has a detrimental effect on the environment, for example, the tree has weed potential and is likely to spread into waterways or natural areas if nearby. • Tree infected with pathogens that will lead to decline and has potential to spread to adjacent trees. • Tree is dead (dead tree may offer habitat values) or is showing signs of significant, immediate, and irreversible overall decline. <p>Tree cannot realistically be retained and should be considered for removal.</p>

Other considerations - Even though a tree may be declining or dead, a tree could be retained for other purposes such as habitat or soil stabilisation. These trees would still need to be managed appropriately to reduce risk.

*A tree may have (attract) a high value by the community for historical, commemorative or other distinct social/cultural significance factors, albeit the tree may not be in good condition. In the context of an assessment, for multiple reasons, but more so for development, if it is a noted 'significant' tree it should receive higher consideration during the planning process.

Trees have many values, not all of which are considered when an arboricultural assessment is undertaken. However, individual trees or tree group features may be considered important community resources because of unique or noteworthy characteristics or values other than their age, dimensions, health or structural condition. Recognition of one or more of the following criteria is designed to highlight other considerations that may influence the future management of such trees.

Significance	Description
Horticultural Value/ Rarity	Outstanding horticultural or genetic value; could be an important source of propagating stock, including specimens that are particularly resistant to disease or exposure. Any tree of a species or variety that is rare.
Historic, Aboriginal Cultural or Heritage Value	<p>Tree could have value as a remnant of a particular important historical period or a remnant of a site or activity no longer in action. Tree has a recognised association with historic aboriginal activities, including scar trees.</p> <p>Tree commemorates a particular occasion, including plantings by notable people, or having associations with an important event in local history.</p>
Ecological Value	<p>Tree could have value as habitat for indigenous wildlife, including providing breeding, foraging or roosting habitat, or is a component of a wildlife reserve.</p> <p>Remnant Indigenous vegetation that contribute to biological diversity</p>

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