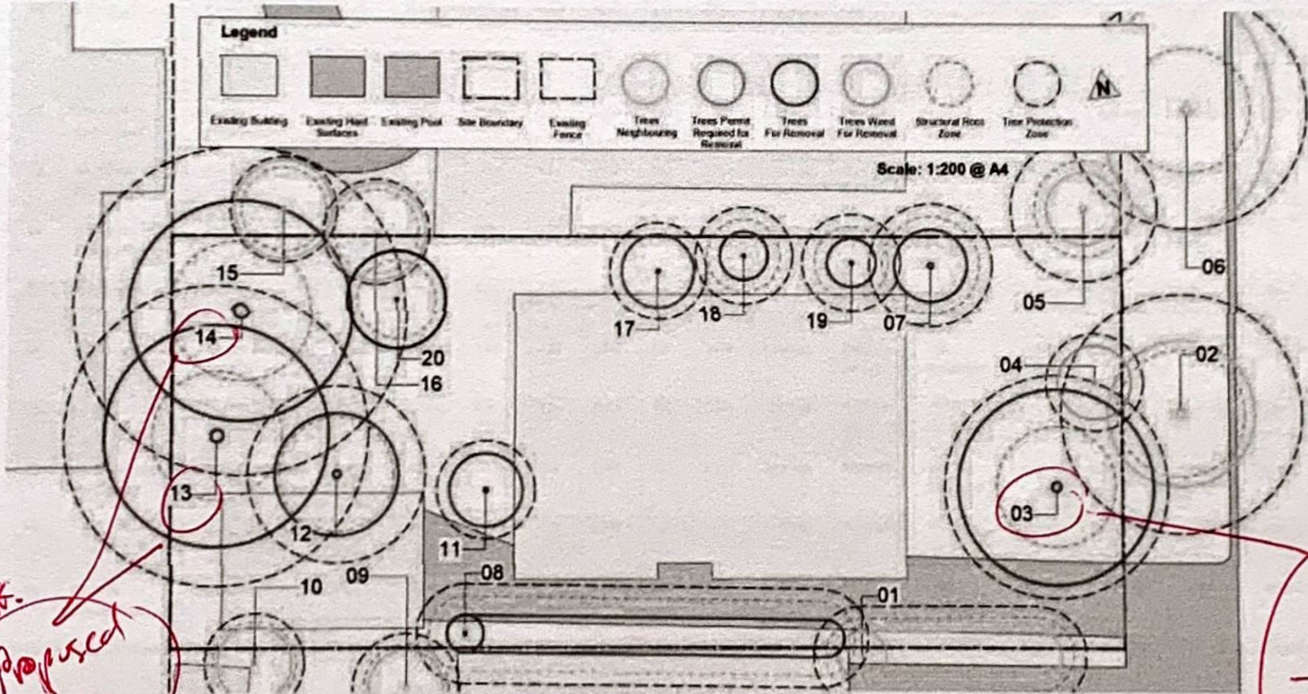


Site Plan - 11 Chancellor Drive, Wheelers Hill

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Site Sketch: 11 Chancellor Drive, Wheelers Hill



* Proposed to remove.

no need to remove.
No intention to remove



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20th August 2021

Residential Space,
2/ 321 Balwyn Road,
Balwyn North,
VIC 3104

Re: 11 Chancellor Drive, Wheelers Hill – Arborist Report

Brief

I was contacted by you and asked to provide an arboriculture assessment of the trees to this property. I understand there may be a development proposal planned for the site. Therefore, this report includes neighbouring or trees which could be impacted upon by a proposed development.

Method

The trees were inspected visually; as per Australian standard 4970 – Protection of Trees on Development Sites (AS 4970), as required to facilitate this report. Heights and canopy spreads estimated, Diameter at Breast Height (DBH) and Diameter at Buttress (DAB) measured within subject site only, unless neighbouring trees are accessible; otherwise, their DBH and DAB are estimated. No root excavations were carried out and images were taken as required. Any trees we nominate for removal are an opinion we are expressing only and do not provide any authority for tree removal. Prior to the removal of any trees council or the determining authority must be contacted, and property titles checked to ensure no permits are required and tree removal is legal. Date Visited 14/5/2020.

The Site

The site is typical to older residence in the area, containing a single storey brick dwelling with separate garage. The site is flat with minimal topographic variation. Vegetation to the site is a mix of mature native trees, exotic palms, environmental weeds, and smaller native and exotic ornamental trees. Surrounding vegetation is of a similar composition, predominately featuring exotic trees. Following a review of planning overlays on planning.vic.gov.au it appears there is a Vegetation Protection Overlay (VPO1) applicable to the site. Under the VPO1:

A permit is required to remove or destroy any vegetation that:

- *Has a trunk circumference greater than 500mm (160mm diameter) at 1200mm above ground level and*
- *Is higher than 10 metres.*

Or

- *Is higher than 7 metres located on 24 Samada Street, Nottinghill.*
- *(former Monash Primary School site)*
- *This does not apply to dead vegetation or to the following species:*
 - *all willow trees*
 - *radiata or*
 - *Monterey pines*
 - *evergreen alders*
 - *sweet pittosporums*
 - *desert ashes.*

As such no vegetation should be removed unless approved by the relevant authority.

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The Trees



Tree 01 is a row of Pittosporum to the neighbouring side of the southern boundary. They have matured typically for the species forming an upright compacted hedge. As it is neighbouring it must be protected if a proposal proceeds. Tree Protection Fencing (TPF), would be required to the extent of the Tree Protection Zone (TPZ), as per AS-4970, forming an enclosed space within the existing site boundary. If site access is required within the TPZ, Ground Protection Measures, as per AS-4970 could be used to allow site access whilst protecting underlying roots.

As per AS-4970 there could be a maximum of 10% encroachment into the TPZ, unless it can be proven there are no roots greater than 40mm diameter or mass of fibrous roots with the proposed encroachment, via a Non-Destructive Root Investigation (NDRI). If roots greater than 40mm diameter or a mass of fibrous roots are present within proposed encroachment dependent on the size, depth, location, and number of roots present a proposal may require modification to the satisfaction of the relevant authority.



Tree 02 is a Prickly Tea Tree to the nature strip of Chancellor Drive, adjacent the site. It has matured typically for the species, forming a mid-sized canopy tree. As it is on council land it must be protected if a proposal proceeds. TPF will be required to the extent of its TPZ, forming an enclosed space within the lawn area of the nature strip. Protection measures must be as per AS-4970 and remain in place for the duration of the development. Refer to Tree 01 for notes on encroachment into a TPZ.



Tree 03 is a Red Iron Bark to the eastern boundary. It has matured in an average manner, however, is starting to decline with the canopy thinning and dieback present through stems to minor branches. Given its lack of vigour, it is of a low retention value and removal and replacement should be considered. Under the VPO1 it would require approval for removal.

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Tree 04 is a Sweet Pittosporum to the eastern boundary. As it is an environmental weed it is recommended for removal. AS noted, it is exempt from permit conditions under the VPO1.



Tree 05 is a Monterey Cypress to the neighbouring side of the northern boundary. It is likely to mature into a substantial tree if not clipped regularly by the neighbour, with the potential to reach 20m high, with a similar width. It's removal in negotiation with the neighbouring is recommended as it is a poor species for cultivation in a suburban context. If the neighbour wish to retain it, it must be protected. Refer to Tree 01 for notes on protection, along with notes on encroachment, as per AS-4970.



Tree 06 is a Red Flowering Gum to the nature strip of Chancellor Drive, to the north of the site. Given its distance from the site, it would not require any species tree protection works prior to a proposal proceeding.

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Tree 07 is a Variagated Yucca to the northern boundary. It is maturing poorly with two main branches radiating from base. Over time the failure of one or both branches is likely. As such it is of a low retention value and recommended for removal. It appears it wouldn't require approval for removal under the VPO1.



Tree 08 is a Mixed Hedge of Pittosporum and Lilly Pily to the southern boundary. It has been clipped to ensure clearance and is maturing poorly as a result with poor branch structure, supporting a high canopy. In addition to this the Lilly Pily are maturing poorly in competition with the Pittosporum.



Tree 09 is a Michelia; Tree 10 is a Rhododendron. Both are located to the neighbouring side of the southern boundary. They are maturing well forming rounded upright small trees. As they are neighbouring, they must be protected if a proposal proceeds. TPF will be required to the extent of their TPZ, offset 1m from proposed works and or existing structures prior to demolition. Within the 1m offset Ground Protection Measures must be used. All protection measures are to be as per AS-4970. Prior to demolition canopy reduction works maybe required for access. If so, these must take place as per AS-4737 and undertaken by a suitably qualified arborist. Following pruning works a long-armed excavator or similar that can be positioned clear of its

TPZ, can then be used to demolish the existing garage. Refer to Tree 01 for notes on encroachment into a TPZ, as per AS-4970.

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Tree 11 is a Lemon to the centre of the site. It has matured poorly and is heavily infected by Gall Wasps and other common citrus pests. It is of a low retention value and recommended for removal. It appears it wouldn't require approval for removal, under the VPO1.



Tree 12 is a Queen Palm to the south of the site, adjacent the shed. Queen Palms produce fruit toxic to fruit bats, along with creating long term maintenance issues when shedding the fruit and old fronds. It is a poor species for cultivation because of these factors and impacts to wildlife and is therefore recommended for removal. It appears it wouldn't require a permit for removal under the VPO1.



Tree 13 is a Rose Sheoak to the west of the site. It has matured typically for the species forming an upright mid-sized tree. Whilst its form is relatively uniform it is supported by poorly structured branches with minor and major branch tear outs likely overtime, particularly the main bifurcation. If this was to occur it presents a hazard risk to anyone present on the site. As such its removal should be considered, with a replacement tree of smaller stature considered. It would require a permit for removal, under the VPO1.

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Tree 14 is a Silky oak to the north-west of the site. It has matured poorly having been lopped in its upper canopy resulting in poor branch structure and canopy form. The point of lopping was its central leader that was likely to have a substantial diameter to it, leaving behind a large surface area for decay. The ivy present across its minor and main branches has likely exacerbated to conditions for decay to occur, increasing the likelihood of decay present at the old lopping point. Given these factors it is of a low retention value and maybe hazardous if retained, with failure of secondary branches likely, posing a risk to anyone on the site, or neighbouring, particularly around the neighbouring pool which is within its fall zone. As it appears to be protected under the VPO1 it will require a permit for removal.



Tree 15 is a Grapefruit; Tree 16 is an Orange. Both are located to the neighbouring side of the northern boundary. As they are neighbouring, they must be protected if a proposal proceeds. Tree protection methods and notes on encroachment are as per Tree 01.



Tree 17 is a Kumquat to the northern boundary. It has matured with multiple over elongated thin branches supporting its thinning and slightly chlorotic canopy. It is of a low retention value and recommended for removal, and appears it wouldn't require approval for removal, under the VPO1.

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Trees 18 and 19 are Capital Pears to the northern boundary. They are maturing poorly having been lopped triggering suckering growth along their trunk that will adversely affect them over time. As such they are of a low retention value and recommended for removal. It appears it wouldn't require approval for removal, under the VPO1.



Tree 20 is a Plum to the northern boundary. It is maturing poorly with short trunk and a broad canopy of over extended branches. It will mature poorly into the future with failure of its main branches likely. As such it is of a low retention value and recommended for removal. It appears it wouldn't require approval for removal, under the VPO1.

Site Sketch and Tree Legend as Follows

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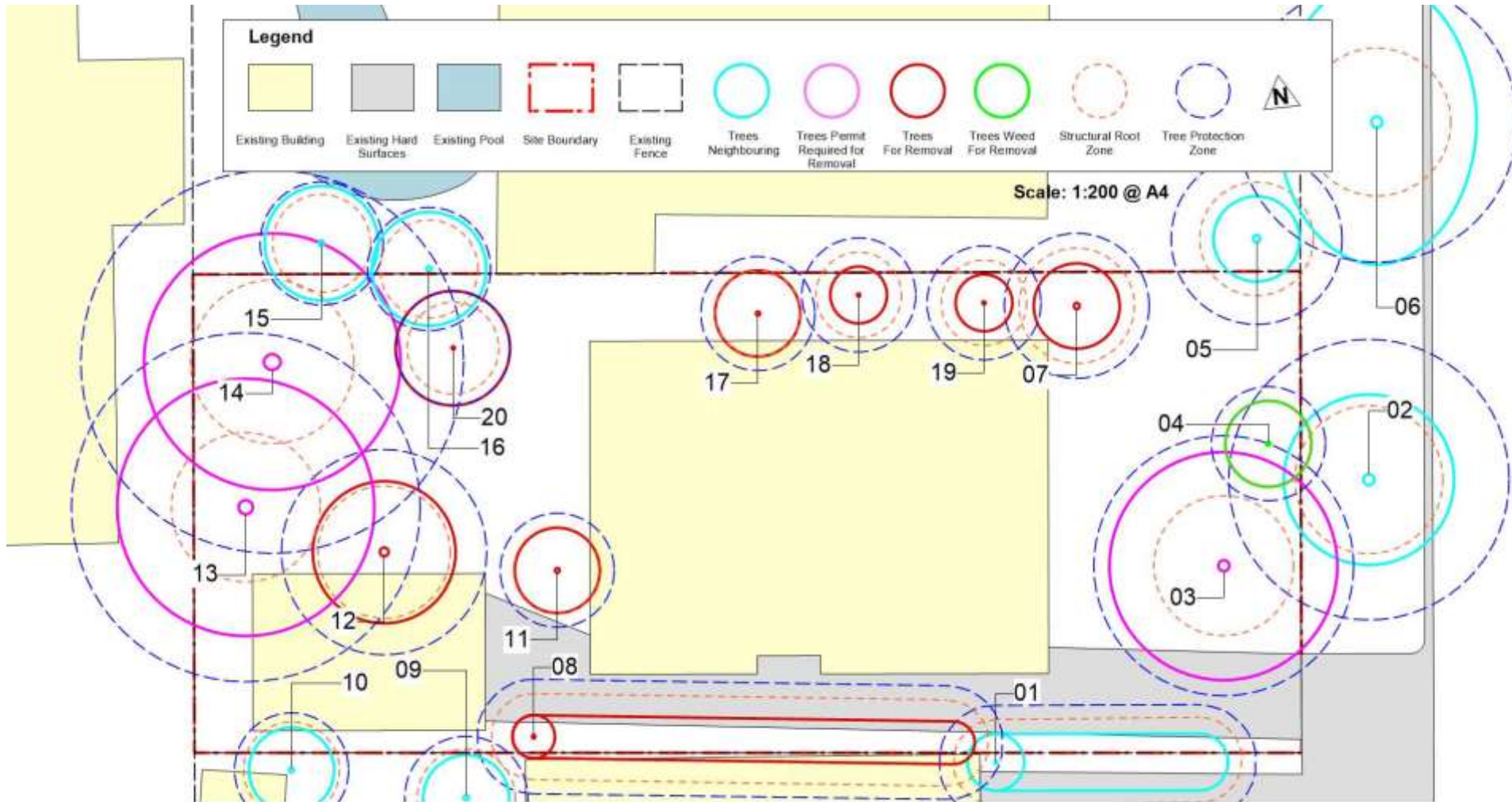
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Site Sketch: 11 Chancellor Drive, Wheelers Hill





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Tree Legend

No	Botanical Name	Common Name	Origin	Height	Canopy	DBH @ 1.4 m	TPZ	DAB	SRZ	Condition	ULE	Significance	Vigor	Structure	Form	Ret Value	Age
01	Pittosporum tenuifolium	Hedge Pittosporum	Exotic	2000	2000	100	2000	130	1500	Average	Medium (16-39 yrs)	Less Significant	Good	Average	Average	Neighbouring	Semi-Mature
02	Melaleuca styphilooides	Prickly Tea Tree	Exotic	10000	6000	410	4920	560	2594	Average	Medium (16-39 yrs)	Less Significant	Good	Average	Average	Council	Mature
03	Eucalyptus sideroxylon	Red Ironbark	Native	10000	8000	380	4560	490	2453	Average	Short (5-15 yrs)	Less Significant	Poor	Average	Average	Low	Mature
04	Pittosporum undulatum	Sweet Pittosporum	Native	3000	3000	150	2000	150	1500	Poor	Removal	Least Significant	Average	Poor	Poor	Weed	Mature
05	Cupressus macrocarpa	Monterey Cypress	Exotic	6000	3000	250	3000	300	1996	Average	Medium (16-39 yrs)	Less Significant	Good	Average	Average	Neighbouring	Mature
06	Corymbia ficifolia	Red Flowering Gum	Exotic	80000	6000	410	4920	560	2594	Average	Medium (16-39 yrs)	Highly Significant	Average	Average	Average	Council	Mature
07	Yucca gigantea 'Variagata'	Variagated Yucca	Exotic	4000	3000	212	2544	310	2024	Average	Removal	Less Significant	Average	Poor	Average	Low	Mature
08	-	Mixed Trees	Exotic	5000	1500	120	2000	130	1500	Average	Removal	Less Significant	Average	Poor	Poor	Low	Semi-Mature
09	Michelia yunnanensis	Michelia	Exotic	4000	3000	180	2160	210	1718	Good	Medium (16-39 yrs)	Less Significant	Good	Average	Good	Neighbouring	Mature
10	Rhododendron sp.	Rhododendron	Exotic	4000	3000	150	2000	200	1683	Average	Short (5-15 yrs)	Less Significant	Good	Average	Average	Neighbouring	Mature
11	Citrus limon	Lemon tree	Exotic	4000	3000	160	2000	160	1533	Poor	Removal	Less Significant	Poor	Poor	Poor	Low	Over Mature



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No	Botanical Name	Common Name	Origin	Height	Canopy	DBH @ 1.4 m	TPZ	DAB	SRZ	Condition	ULE	Significance	Vigor	Structure	Form	Ret Value	Age
12	Syagrus romanzoffiana	Queen Palm	Exotic	8000	5000	300	3600	430	2322	Average	Medium (16-39 yrs)	Least Significant	Good	Average	Average	Low	Mature
13	Allocasurina torulosa	Rose Sheoak	Native	11000	9000	510	6120	570	2613	Average	Medium (16-39 yrs)	Less Significant	Average	Poor	Average	Moderate	Mature
14	Grevillea robusta	Silky Oak	Native	11000	9000	560	6720	710	2866	Poor	Short (5-15 yrs)	Less Significant	Average	Poor	Average	Low	Mature
15	Citrus x paradisi	Grape Fruit	Exotic	4000	4000	180	2160	210	1718	Average	Short (5-15 yrs)	Less Significant	Good	Average	Average	Neighbouring	Mature
16	Citrus sinensis	Orange	Exotic	5000	4000	180	2160	210	1718	Average	Short (5-15 yrs)	Less Significant	Good	Average	Average	Neighbouring	Mature
17	Citrus reticulata	Kumquat	Exotic	4000	3000	150	2000	150	1500	Poor	Removal	Less Significant	Poor	Poor	Poor	Low	Mature
18	Pyrus calleryana	Callery Pear	Exotic	4000	2000	112	2000	150	1500	Average	Removal	Less Significant	Average	Poor	Average	Low	Semi-Mature
19	Pyrus calleryana	Callery Pear	Exotic	4000	2000	112	2000	150	1500	Average	Removal	Less Significant	Average	Poor	Average	Low	Semi-Mature
20	Prunus domestica	Plum	Exotic	4000	4000	112	2000	180	1611	Average	Removal	Less Significant	Average	Poor	Average	Low	Semi-Mature



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Definitions

As per Australian Standard 4970 – 2009 – Protection of Trees on Development Sites (AS 4970):

Tree

AS 4970 Defines a Trees as ...

1.4.6 Tree Long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority).

Therefore, unless otherwise required by the determining authority or if it is neighbouring and could be impacted upon, we do not include any plants under this size.

TPZ and SRZ Methodology

Determining the Tree Protection Zone (TPZ)

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12

Where - DBH = trunk diameter measured at 1.4 metres above ground; radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2 metres and no greater than 15 metres except where crown protection is required. Some instances may require variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 metre outside the crown projection.

This area is an estimate of the space required to maintain the health of a tree long term. It is entirely possible to work inside this Zone providing due care is exercised according to AS 4970.

Determining the Structural Root Zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree. The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

There are many factors that affect the size of the SRZ; e.g. tree height, crown area, soil type, soil moisture etc. The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula:

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

Where - D = trunk diameter, in m, measured above the root buttress.

The SRZ for trees with trunk diameters less than 0.15m will be 1.5m.

This is an indicative calculation which generalizes all the conditions influencing the estimate. SRZ is often less than the indicated calculation. A Non-Destructive Root Investigation (NDRI) as per AS 4970 may provide more information regarding extent of these roots.

TPZ and SRZ Encroachment

Any encroachment into TPZ should be advised and supervised by a qualified Arborist

AS 4970 says:

3.3.2 Minor encroachment

If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

AS 4970 also says:

3.3.4 TPZ encroachment considerations

When determining the potential impacts of encroachment into the TPZ, the project arborist should consider the following:

(a) Location and distribution of the roots to be determined through non-destructive investigation methods (pneumatic, hydraulic, hand digging or ground penetrating radar). Photographs should be taken and a root zone map prepared.

NOTE: Regardless of the method, roots must not be cut, bruised or frayed during the process.

It is imperative that exposed roots are kept moist and the excavation back filled as soon as possible.

(b) The potential loss of root mass resulting from the encroachment: number and size of roots.

(c) Tree species and tolerance to root disturbance.

(d) Age, vigour and size of the tree.

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(e) Lean and stability of the tree.

NOTE: Roots on the tension side are likely to be most important for supporting the tree and are likely to extend for a greater distance.

(f) Soil characteristics and volume, topography and drainage.

(g) The presence of existing or past structures or obstacles affecting root growth.

(h) Design factors.

Tree sensitive construction measures such as 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 taken into account.

Precautions should be taken at the planning and design stage to minimize potential conflict between trees and new structures

When the root zone is reactive clay, techniques such as localized pier and beam (bridged), screw pile footings or root and soil moisture control barriers may be appropriate to minimize effects on structures.

NOTE: Collaboration may be required between the project arborist and the geotechnical or structural engineer.

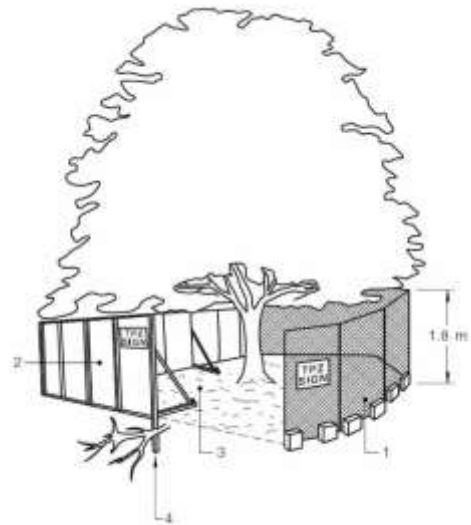
Landscapes by Design believes it is vital to ensure that construction is strong enough to withstand any encroachment by the tree as it grows. Pro-active measure like root control barriers and moisture barriers before trees grow to maximum size may be considered.

Tree Protection Fencing

The image to the right provides an example of suitable protective fencing:

Legend:

1. Chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2. Alternative plywood or wooden paling fence panels. This fencing material also prevents building materials or soil entering the TPZ.
3. Mulch installation across surface of TPZ (at the discretion of the project arborist). No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ. Bracing is permissible within the TPZ. Installation of supports should avoid damaging roots.



Tree Protection Fencing must be erected prior to any works of any nature commencing and before any machinery or materials are brought onto the site. Once erected this protective fencing must not be removed or altered until such time as all works associated with the construction are complete, unless approved and supervised by an Arborist. It must have signs attached to it saying "Tree Protection Zone – Stay Out" at maximum 2.4 metres centres or on each panel

Immediately following erection of the Tree Protection Fencing, the Tree Protection Zones are to be weeded and then mulched with 75 mm depth leaf mulch or similar, that has been aged for at least 12 weeks.

No trenching or excavation is to occur within this Tree Protection Zones. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches. The directional drilling bore should be at least 600 mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees. A NDRI may assist in this case. See Later section.

The Tree Protection Fencing Zone should be secured to restrict access. AS 4687 – Temporary Fencing and Hoardings specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area. Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots. Existing perimeter fencing and other structures may be suitable as part of the protective fencing.

The Tree Protection Fencing Zone should be secured to restrict access.

AS 4687 – Temporary Fencing and Hoardings specifies applicable fencing requirements. Shade cloth or similar should be attached to reduce the transport of dust, other particulate matter and liquids into the protected area.

Fence posts and supports should have a diameter greater than 20 mm and be located clear of roots.

Existing perimeter fencing and other structures may be suitable as part of the protective fencing.

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If it is necessary to remove the Tree Protection Fencing to allow works to be carried out it must be reinstated daily immediately following completion of works. If works are carried out within the Tree Protection Zones this work must be supervised by an Arborist. During required work suitable planking should be laid within the Tree Protection Zone to protect against compaction to the roots of the tree / trees from workers and others. It is recommended that machinery does not enter the Tree Protection Zone (see 4.2 from AS 4970 below: "*Activities generally excluded*"), however rumble boards, plates, or sheets of heavy duty materials over mulch and an impervious membrane can be used if vehicles need to move through the zone. Excavation can be carried out by machine using skilled operators briefed by and observed by an Arborist. Mini-excavators should be used and if possible, the vehicle located outside the zone with its tool arms moving within the site. In the case of a NDRI being conducted the workmen and their equipment are only in the area for a short time however extreme care must be taken to protect the trunk, canopy and roots of the tree/s.

Irrigation –

During warmer periods the Tree Protection Zones should be irrigated with 1 litre of clean water for every 1 cm of trunk girth measured at the soil / trunk interface on a weekly basis.

No persons, vehicles or machinery are to enter the Tree Protection Zones unless authorised to do so, preferably with permission from the Determining Authority.

No fuel, oil dumps or chemicals are allowed to be used or stored within the Tree Protection Zones; the servicing and refuelling of equipment and vehicles must be carried out away from the TPZ; no storage of material or equipment is to take place within them; nothing whatsoever, including temporary services wires, nails, screws or any other fixing device, is to be attached to any tree.

4.2 ACTIVITIES RESTRICTED WITHIN THE TPZ

Activities generally excluded from the TPZ include but are not limited to—

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

Trunk and Branch Protection

Trees impacted upon by construction works should be protected as per the Sketch 1 below. It is suggested that suitable rubberised padding material be used under 75 by 50 hardwood timber which is strapped with galvanised tin strapping approximately 30 mm wide at 900 mm spacing from bottom of trunk upwards and nailed or screwed to the hardwood timber with 25 mm long galvanised fasteners. The rubberised padding material should be perforated to allow air to the trunk, and not soak water into itself. No nails or screws are to enter the tree trunk or branches and care must be taken to ensure that no materials bite into the tree surface and scar or damage its surface in any way.

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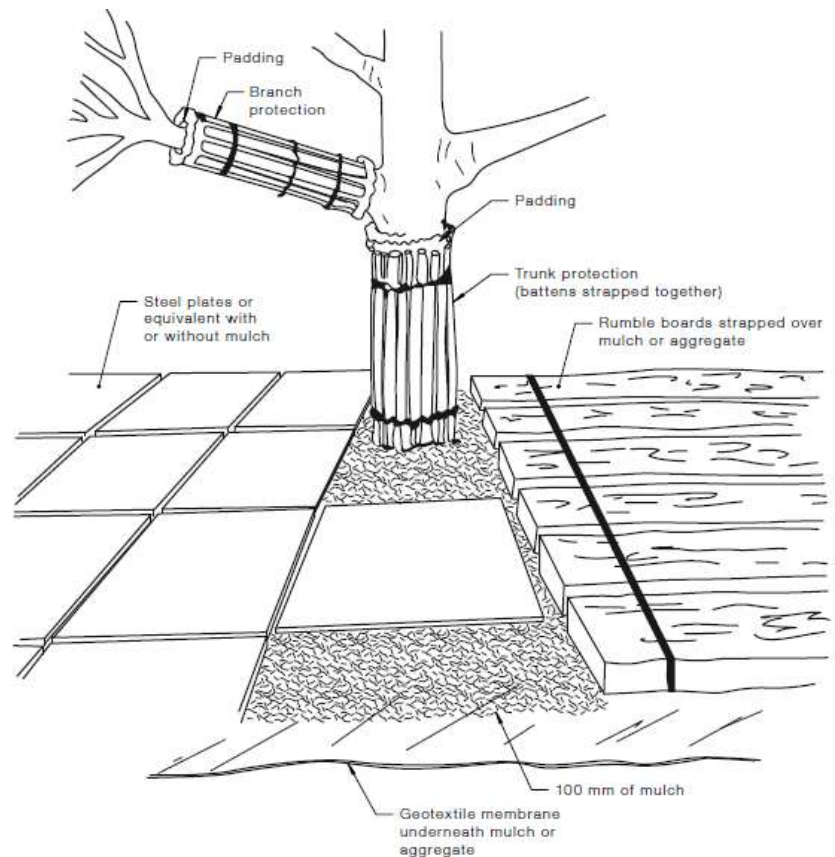
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Ground Protection

The planking to the right in the sketch following is an example of the planking that could be used. If temporary access for machinery is required within the TPZ, ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures should include a permeable membrane such as Geo-textile fabric beneath a layer of mulch or crushed rock, below rumble boards as per sketch 1. Rubber matting and packing plywood may also be used. Under this planking or sheeting within the TPZ, a 75 mm layer of leaf mulch or similar, aged for at least 12 weeks and proven to contain no toxic substances must be installed. These measures may also be applied to root zones beyond the TPZ. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.



Non-Destructive Root Investigation (NDRI)

A (NDRI) according to AS 4970 may be conducted to provide more information on the extent of a tree's SRZ or encroachment over 10% into TPZ. The SRZ is an indicative measure and the actual positions and extent of the roots can only be determined by an investigation. A trench is carefully excavated along a pre-determined line (for example, the edge of a proposed slab or decking posts) to a depth of at least 650 mm and no more than 300mm wide. If roots are located, they must be carefully exposed without any damage to the root. The position and size of any roots found can be photographed, recorded and mapped. If there are too many large roots or root mats found the Arborist may decide to move the trench further out from centre of trunk. A NDRI may indicate that a building can or cannot be placed in the proposed location, or that piers/stumps can be placed between roots, or that roots are not extending far enough to directly damage a building/path/pipe. The NDRI map may lead to design and engineering changes to enable a building, extensions, or earthworks that encroach into the TPZ, to proceed or be moved. Where possible the trenching is done by hand but there are times when machinery or water pressure excavation can be used under the supervision of an Arborist.

Root Protection during Works within the TPZ

Some approved works within the TPZ, such as regrading, installation of piers or landscaping may have the potential to damage roots.

If the grade is to be raised the material should be coarser or more porous than the underlying material. Depth and compaction should be minimized.

Manual excavation is the preferred method and should be carried out under the supervision of an arborist to identify roots critical to tree stability and determine the actual extent of the SRZ. A NDRI may be used with photographs and maps to serve as a guide for designers and workers. Relocation or redesign of construction works may be required. (See preceding section)

Where the project arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut back to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressings or paints. It is not acceptable for roots within the TPZ to be 'pruned' with machinery such as backhoes or excavators.

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

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Other excavation works in proximity to trees, including landscape works such as paving, irrigation and planting can adversely affect root systems. The project arborist should be consulted and supervise any works.

TPZ Encroachment Over 10%

If the proposed building footprint encroaches into the TPZ more than 10%; either the building footprint will have to change to reduce the encroachment to 10% or a NDRI could be carried out by an Arborist to determine the exact location of any roots present. Prior to a NDRI make certain to contact the Determining Authority to see if permission is required. If roots are discovered belonging to the tree that are under 40 mm diameter, they could be cut by an arborist to allow either the entire building footprint to be accommodated, or if that is not possible, a smaller redesigned building footprint to be accommodated. If the TPZ is varied following a NDRI (as per AS 4970) room must be allowed for the lost area to be compensated for elsewhere. Roots greater than 40 mm diameter and fibrous root mats or clumps greater than 50mm diameter should not be cut but need to be worked around. A well-qualified arborist may cut a root greater than 40 mm diameter, but not greater than 50 mm diameter unless given permission to cut from the Determining Authority.

Alternatively, if a NDRI shows it is impossible to vary the TPZ, alternative “tree friendly” construction methods could be employed, such as installing a building slab above grade, pier and beam methods, or building on stumps. Piers and stumps can be relocated to avoid damage to any significant roots discovered by the NDRI. These alternative building methods should be specified by a suitably qualified person.

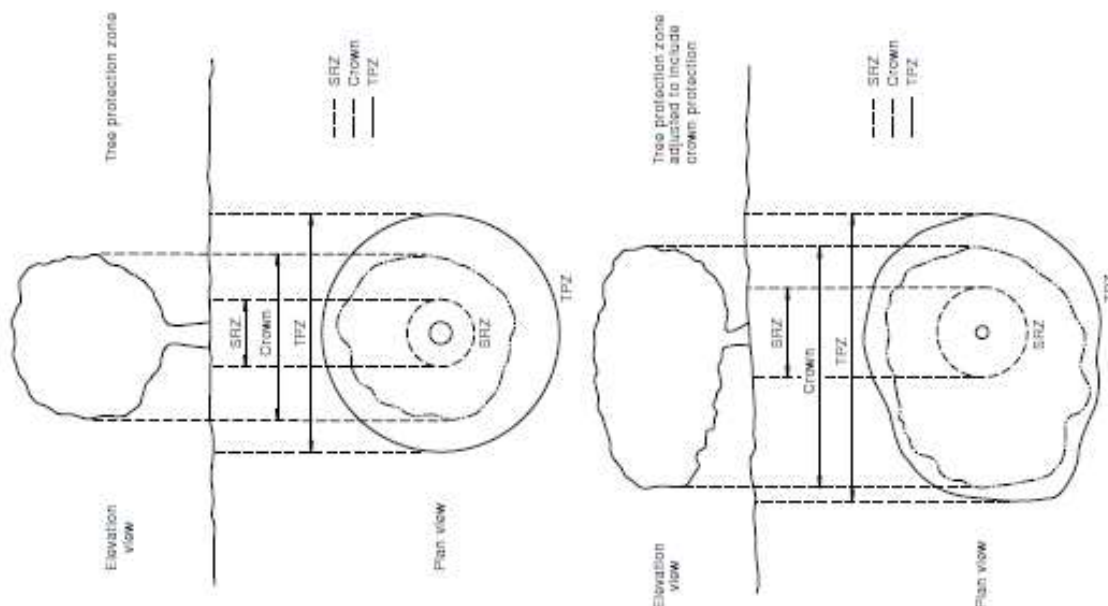
Installing Underground Services within TPZ

All services should be routed outside the TPZ. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches. The directional drilling bore should be at least 600 mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees.

For manual excavation of trenches, the project arborist should advise on roots to be retained and should monitor the works. Manual excavation may include the use of pneumatic and hydraulic tools.

Crown protection

Tree crowns may be injured by machinery such as excavators, drilling rigs, cranes, trucks, hoarding installation and scaffolding. The TPZ may need to include additional protection of above ground parts of the tree. Where crown protection is required, it will usually be located at least one metre outside the perimeter of the crown (see Figure 2). The erection of scaffolding may require an additional setback from the edge of the crown. Crown protection may include pruning, tying-back of branches or other measures. If pruning is required, requirements are specified in AS 4373 and should be undertaken before the establishment of the TPF. NOTE: Pruning may require approval from the Determining Authority. See following section on Pruning and Removal of Trees



NOTE: Refer to Clause 3.2 for installation of TPZ.
FIGURE 2 - INDICATIVE TREE PROTECTION ZONE



Pruning and Removal of Trees

If pruning is required, it should be carried out in accordance with Australian Standard 4373 - Pruning of Amenity Trees (AS4373) and any root pruning also as per AS 4973 – Specialist advice from a person with a minimum AQF Level 4 in Arboriculture should be sought before any root pruning occurs.

Prior to the pruning of or removal of any tree the Determining Authority, usually the local council must be consulted to be certain the pruning or removal is allowed by them and is lawful.

In any development seek approval for tree removal and encroachment into the TPZ of trees from the Determining Authority; before planning or building preparation and drawings are completed. This is to ensure that building or other drawings are not prepared based on this report, when a relevant Determining Authority does not allow the trees nominated in our report to be removed, or their TPZ's encroached into.

Scaffolding

Where scaffolding is required, it should be erected outside the TPZ. Where it is essential for scaffolding to be erected within the TPZ, branch removal should be minimized. This can be achieved by designing scaffolding to avoid branches or tying back branches. Where pruning is unavoidable it must be specified by the project arborist in accordance with AS 4970 and 4373.

NOTE: Pruning works may require approval by the determining authority.

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

There is a risk of materials falling off the scaffold decking and into the TPZ, damaging the tree. Care must be exercised, and solid walls or mesh barriers be installed on any scaffolding over the TPZ.

Impervious membrane, mulch, boards or plywood must be used under the scaffold soleplates and no excavation is to be performed for the soleplates. It may be possible to erect secondary fencing inside the general TPZ fencing to further protect the tree from damage.

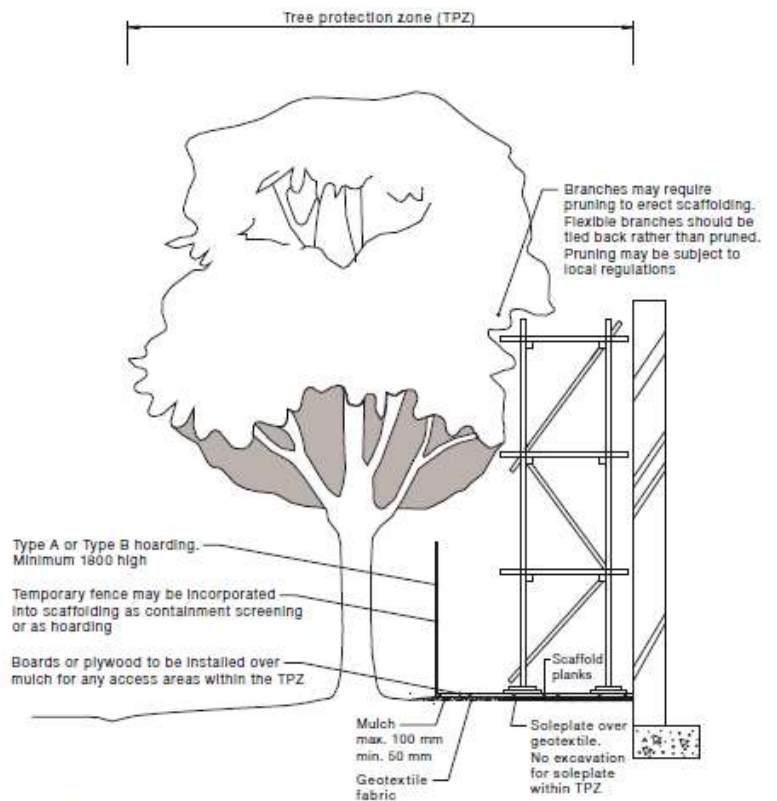


FIGURE 5 INDICATIVE SCAFFOLDING WITHIN A TPZ

Parameters – Used as required:

Condition, Vigour, Structure and Form - Each has four parameters: Excellent, Good, Average and Poor.

SULE – Safe Useful Life Expectancy - Has four parameters – Long (40 + years), Medium (16 to 39 years), Short (5 to 15 years) and Removal

Significance - Has five parameters – Most, Highly, Less, Least and Hazardous

Age – Has four parameters:

Young – Less than one third of expected life span

Semi Mature – Into second third of expected life span

Mature – Into last third of expected life span



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Over Mature – Beyond normal life span or age-related state of decline

Retention Value – has nine parameters High, Moderate, Low, Weed, Neighbouring, Owners Choice, Damaging, Council and Hazardous when required following another parameter. Generally Neighbouring Trees must be retained and protected unless suitable arrangements can be made for their removal with the owner, and that removal is legal. Council trees to streets or neighbouring parks are that Council's responsibility. After a tree report is submitted that includes Council trees, it is suggested that council should inspect their trees to ensure they are safe and worthy of retention.

Definitions - Terms:

Acute Branch Crotch – Angle on the inner side of the branch crotch is less than 90 degrees.

Definitions - Terms:

Acute Branch Crotch – Angle on the inner side of the branch crotch is less than 90 degrees.

Apical Dominance - the main central stem of the plant is dominant over the other branches.

Bacterial Wet Wood - is a bacterial disease of certain trees, primarily elm, cottonwood, poplar, boxelder, ash, aspen, fruitless mulberry and oak.

Branch Union – point where a branch originates from the trunk or another branch; may be referred to as a crotch.

Bracket Fungi or Shelf Fungi - are the fruiting structures of many different fungi that cause heartwood decay in standing trees.

Co-dominant Stems – 'Co-dominant stems are two stems or trunks of equal size that develop from 2 apical buds at the tip of the same stem. Each co-dominant stem is a direct extension of the stem below its origin. There are no branch collars or trunk collars at the base of co-dominant stems' (Dr Alex Shigo) – Similar to Bi-furcated meaning two, Tri-furcated meaning three and Quadrifurcated meaning four.

Compartmentalise – (CODIT: Compartmentalization of Decay in Trees. Dr Alex Shigo) natural process of defence in trees by which they wall off decay in wood and heal wounds.

Crown Gall - plant disease probably caused by the bacteria or invasion of some sort into the tree

Dead Wooding Removal of dead, dying and diseased branches throughout the crown.

De-current – growth habit developing a more rounded form with multiple scaffold branches

Determining Authority – Usually refers to the Council responsible for the property being assessed but includes any government or semi-governmental authority that has control or liability under common law, and the role to encourage and enforce the developmental process including legislation relating to trees and plants.

Epicormic Shoots - An epicormic shoot is a shoot growing from an epicormic bud which lies underneath the bark of a trunk, stem, or branch of a plant. In older wood, epicormic shoots can result from severe defoliation or radical pruning.

Etoliation is a process in plants grown in partial or complete absence of light. It is characterized by long, weak stems; smaller, sparser leaves due to longer internodes; and a pale-yellow colour (chlorosis).

Ex-current - growth habit with pyramidal crown and a central leader

Fall Zone – area under a tree or adjacent to it where if it failed it could impact upon.

Frass – Granular wood particles produced by borer insects that can be fine, medium or coarse depending on the type of insect.

Flush Cut - Pruning technique in which both branch and stem tissue are removed; generally considered poor practice. Flush cuts can allow decay to enter back into the main trunk or branch.

Gall - abnormal outgrowth of tissues and can be caused by various parasites, from fungi and bacteria, to insects and mites. Sometimes called a burl.

Ground Heaving – ground lifting or heaving as the root plate of a trees moves.

Hedges – Are not assessed as trees; therefore, a canopy dimension is represented in drawings not the TPZ.

Included Bark - bark that becomes embedded in a crotch between branch and trunk or Co-Dominant Stems and causes a weak structure.

Indigenous – a plant occurring naturally in the area or region of the subject site.

Kino Sap oozing from a tree caused by structural damage and / or disease or pests.

Later Growth – growth formed later in a tree's life cycle with perhaps poor attachment.

Obtuse Branch Crotch – where the angle on the inner side of the union is greater than 90 degrees.

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Phototropism or Phototropic Lean - is the phenomenon in which plants follow or grow towards a light source, most commonly the sun.

Picus Tomograph - used for tree risk assessments in order to measure the thickness of the residual wall of trees with internal defects such as cavities or decay non-invasively with sound waves sent through the tree.

Reaction Wood - tree wood formed as a result of mechanical stress helping to provide strength to affected areas as in leaning trees, wind exposure, over weighting, compartmentalisation of decay etc. A sign a tree could fail.

Scaffold Branch – the permanent or structural branches of a tree

Senescence – the condition or process of growing old especially the condition resulting from the transitions and accumulations of the deleterious aging process. Senescent

Torsional Loading – When a tree generally by the wind has had part of its structure twisted as it grows.

?? – After a tree's name means identity of species may not be exact.

Tree – As defined by AS 4970: A long lived woody perennial plant greater than (or usually greater than) 3 m in height with one or relatively few main stems or trunks (or as defined by the determining authority). Landscapes by Design believes that the definition is too loose and too general to include all the plants that we would include in the definition of a tree, however it serves to encompass most plants that we assess. We also assess where required, neighbouring plants other than trees.

Disclaimer etc

No examination of any sort has been carried out to the root systems of these trees. Given factors like environmental, vegetative and other overlays and local or other planning controls it is difficult to accommodate or satisfy all parties when assessing trees and other vegetation. It is very difficult to establish clear outcomes and impossible to determine that a tree can be deemed safe under all circumstances. No guarantee can be given that a tree is totally safe or will remain healthy given short-term adverse weather conditions or long term climatic conditions or other environmental and physical factors. No guarantees can be given for any part of a trees current or future stability. The writer and Landscapes by Design Pty Ltd does not accept any responsibility for any tree or part of it assessed, with regard to its ongoing stability and safety, or its capacity to damage property, other assets or people.

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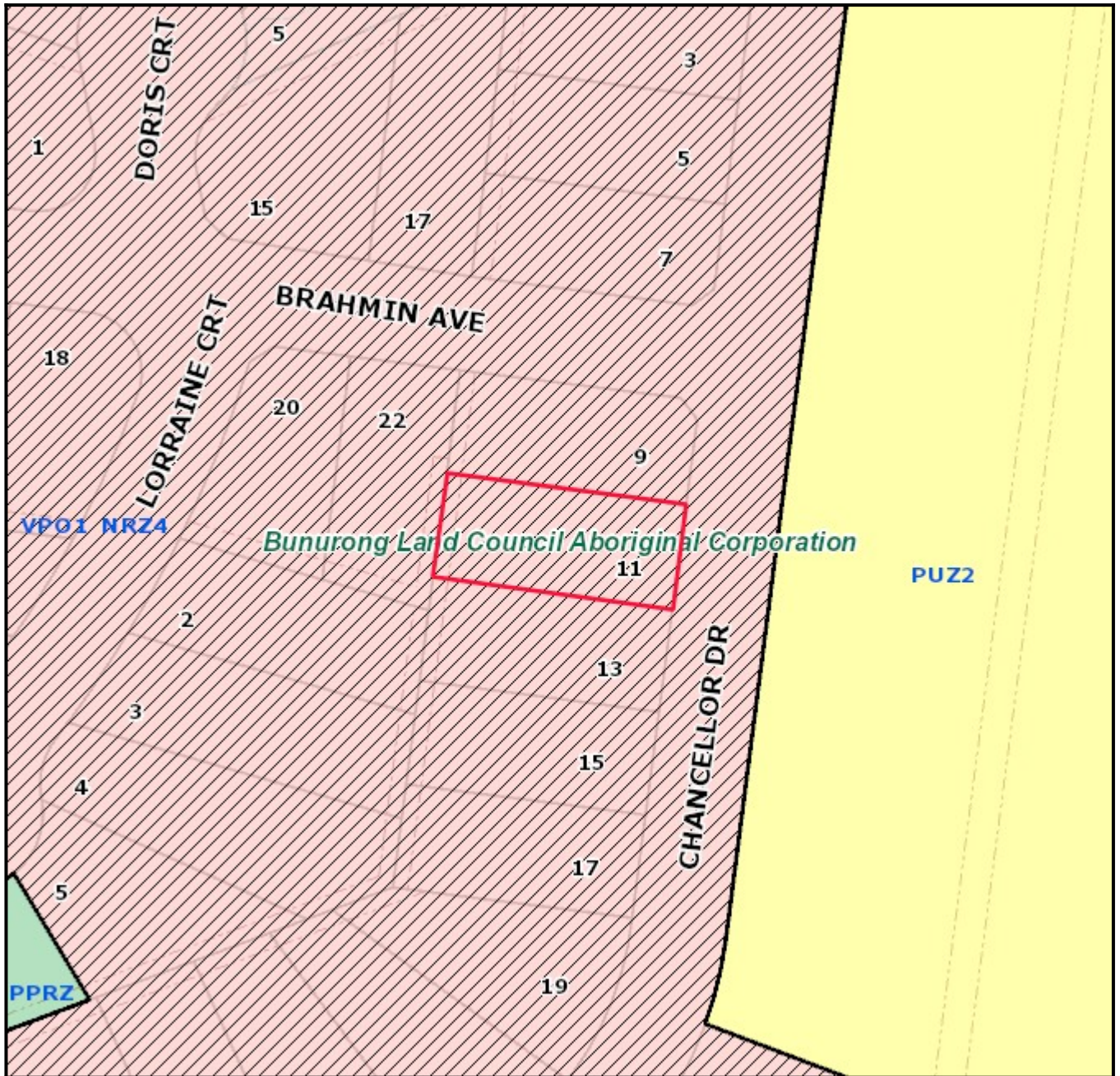
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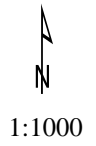
Planning Overlays and Zones



Legend

Planning Zones

Planning Overlays



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Area: 651 sqm

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The City of Monash endeavours to keep the information current, and welcomes notification of omissions or inaccuracies.