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Homewood Ref: 3998

Tuesday, 26 October 2021

**RE: Assessment of trees around the intersection of Deakin Avenue and O'Connor Street, Haberfield**

Dear Brent,

As per your request, an amended design (Drawing No. 82021192-01-C1010) for proposed upgrade of stormwater drainage infrastructure has been reviewed in relation to its impact to trees.

A tree assessment (by Jason Clifford, 24/07/2021) and Construction Impact Assessment report (by Arran Provis 02/08/2011) was previously completed by Homewood in consideration of different design plans.

Only trees within the immediate vicinity of proposed works (Trees 3-9, 13, 14 & 18) are discussed and referenced in this document, and Tree IDs are as per the 2011 report. One additional tree located outside 92 O'Connor Street, not previously assessed is also included and is referred to herein as Tree 19.

Tree data is provided in Table 1. Overall, the findings are consistent with the 2011 report, however many of the DBH and DAB measurement have increased, resulting in larger SRZ and TPZ dimensions.

Undertaking the proposed infrastructure upgrade works in this location in a tree-sensitive manner is challenging given the extent of works, and the number and size of surrounding trees. The 2011 report recommended installation via directional boring be considered as an option to minimise tree root impacts.

Updated plans propose trenching, with the alignment altered to reduce impact to trees. The current design is a noted improvement in regard to tree impacts when compared to the previously assessed design. Alignment of trenches and proposed works have, in general, avoided or significantly reduced encroachment of the Structural Root Zone. In terms of installation via trenching, the proposed design presents as a best-case scenario in regard to tree impacts.

One tree (Tree 18- 'Low' retention value) will require removal to facilitate the design. The remaining trees can be retained with the adoption of the tree protection measures outlined below and depicted in the Tree Protection Plan (page 4):

1. TPZ and SRZ dimensions outlined in Table 1 are shown to scale on all Site Plans.
2. Tree protection measures, as outlined in this document, are included in any site induction and all contractors are made aware of these recommended measures prior to commencing work.

3. There is no further excavation or other works undertaken beyond that which is indicated in provided plans.
4. Any works including excavation, installation or demolition/removal of infrastructure within the TPZ of retained trees is conducted under the direct supervision of the Project Arborist (minimum AQF5) and is undertaken as follows:
  - 4.1 May require use of sensitive/alternative excavation techniques such as manual excavation, hydro-excavation, use of smaller excavator buckets etc.
  - 4.2 Any root tearing between the point of excavation and the tree trunk must be avoided.
  - 4.3 Exposed tree roots greater than 40mm in diameter must be retained intact and must not incur any mechanical damage.
  - 4.4 Exposed tree roots less than 40mm in diameter may be cleanly pruned by the Project Arborist at right angles using sharp, clean tools.
5. Trees 3, 5 and 7 are pruned to obtain 3m vertical clearance over the proposed works area prior to the commencement of works.
  - 5.1 Branch pruning should be limited to that required to obtain sufficient clearance to undertake works.
  - 5.2 Pruning should be undertaken by a qualified arborist in accordance with AS4373-2007 *Pruning of Amenity Trees*.
6. Trunk protection, as outlined in Figure 1, is installed around Trees 5-7, 13 & 14.
  - 6.1 Protection may consist of padding surrounding the trunk or branch, held in place with batons strapped together, or similar. Boards are to be strapped to trees, not nailed or screwed.

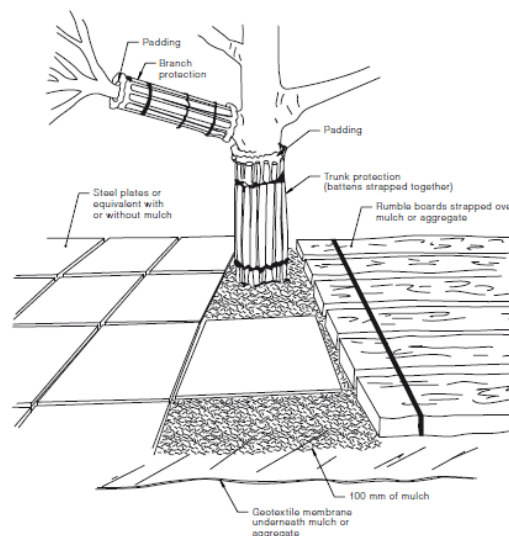
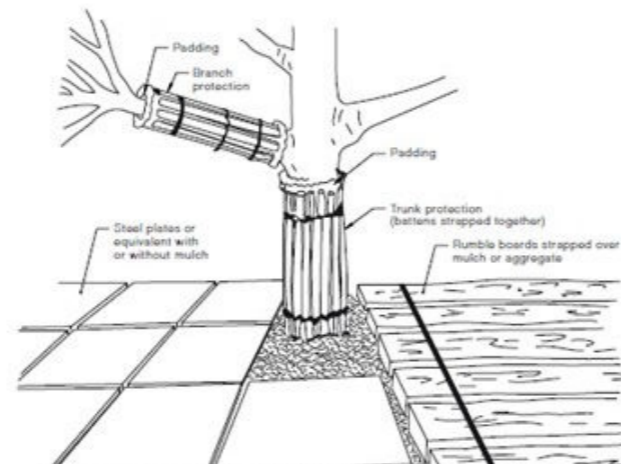


Figure 1: Example of trunk, branch and ground protection

If you have any further queries, please contact me on 1300 404 558

Regards,

Andrew Salo  
Consulting Arborist



### Recommended Tree Protection Measures

1. TPZ and SRZ dimensions outlined in Table 1 are shown to scale on all Site Plans.
2. Tree protection measures, as outlined in this document, are included in any site induction and all contractors are made aware of these recommended measures prior to commencing work.
3. There is no further excavation or other works undertaken beyond that which is indicated in provided plans.
4. Any works including excavation, installation or demolition/removal of infrastructure within the TPZ of retained trees is conducted under the direct supervision of the Project Arborist (minimum AQF5) and is undertaken as follows:
  - 4.1 May require use of sensitive/alternative excavation techniques such as manual excavation, hydro-excavation, use of smaller excavator buckets etc.
  - 4.2 Any root tearing between the point of excavation and the tree trunk must be avoided.
  - 4.3 Exposed tree roots greater than 40mm in diameter must not incur any mechanical damage and be retained.
  - 4.4 Exposed tree roots less than 40mm in diameter, may be cleanly pruned by the Project Arborist, at right angles and using sharp, clean tools.
5. Trees 3, 5 and 7 are pruned to obtain 3m vertical clearance over the proposed works area prior to the commencement of works.
  - 5.1 Branch pruning should be limited to that required to obtain sufficient clearance to undertake works.
  - 5.2 Pruning should be undertaken by a qualified arborist in accordance with AS4373-2007 *Pruning of Amenity Trees*.
6. Trunk protection, as outlined below, is erected around Trees 5-7, 13 and 14.
  - 6.1 Protection may consist of padding surrounding the trunk or branch, held in place with batons strapped together, or similar. Boards are to be strapped to trees, not nailed or screwed.

### Standard Tree Protection Measures

#### Tree Protection Fencing

- Fencing must be to a minimum height of 1.8m high and consist of chain wire mesh panels held in place with concrete feet. Fencing must comply with Australian Standard AS 4687-2007 Temporary fencing and hoarding.
- Fixed signs are to be provided on all visible sides of the TPZ fencing stating 'Tree Protection Zone - Keep Out'
- Where works are permitted within the TPZ, fencing is taken in to only the minimum amount necessary to allow the works to be completed.

#### Ground Protection

- Where temporary access for machinery is required within the TPZ, ground protection measures will be required to prevent root damage and soil compaction.
- Ground protection measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.

#### Trunk and Branch Protection

- If trees cannot be isolated from vehicle or machinery by TPZ fencing, trunk and branch protection will be required to prevent mechanical damage.
- Protection may consist of padding surrounding the trunk or branch, held in place with batons strapped together, or similar.
- Boards must be strapped to trees, not nailed or screwed.

#### TPZ Maintenance

- The area within the TPZ should be mulched, to a depth of 50-100mm. Where the existing landscape within the TPZ is to remain unaltered mulch may not be required.
- Soil moisture levels should be regularly monitored by the project arborist and if necessary supplementary irrigation applied.

#### Prohibited activities within the TPZ

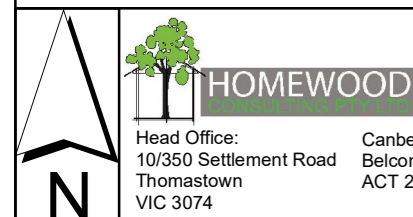
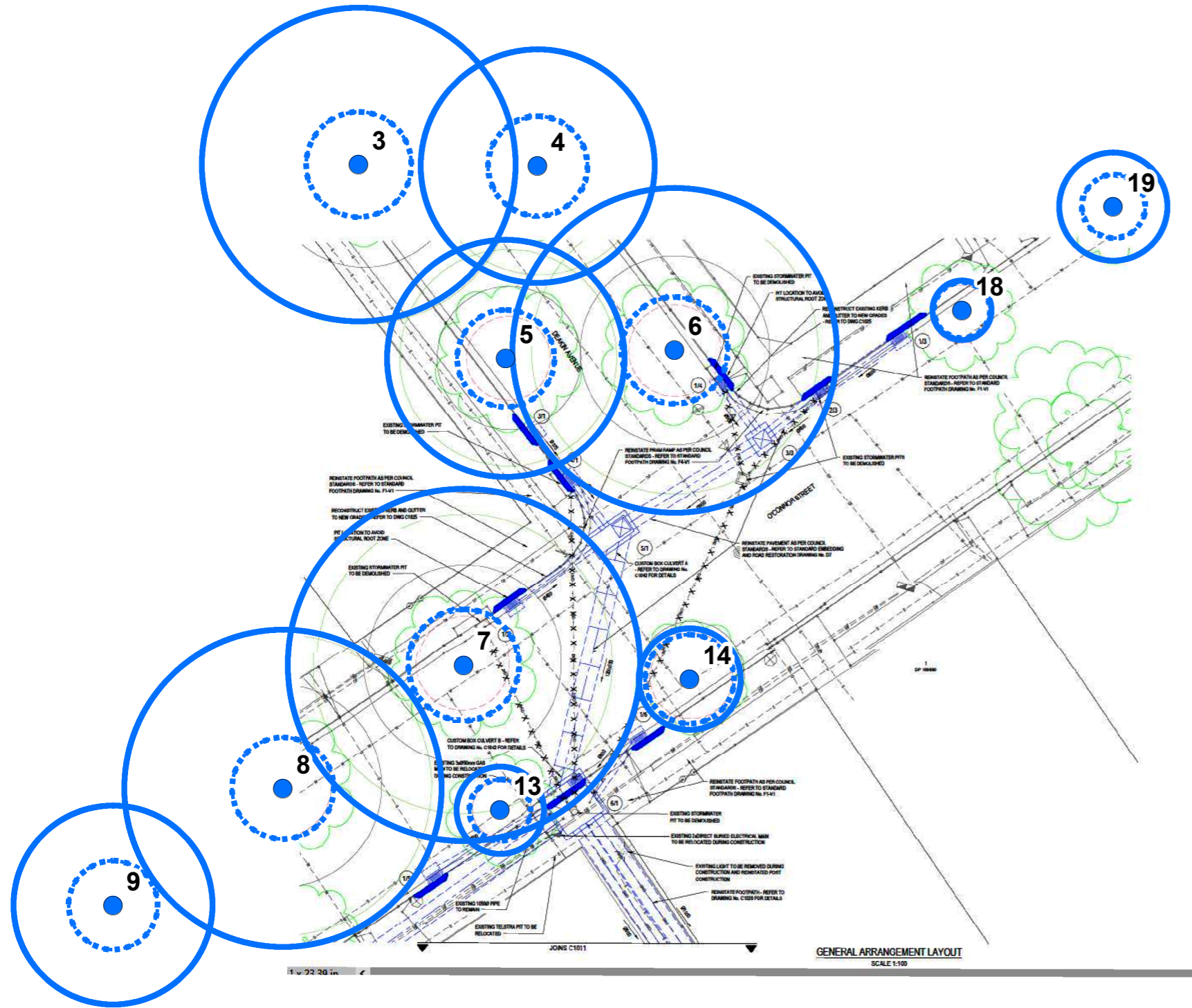
- |                               |  |   |
|-------------------------------|--|---|
| -machine excavation including | -preparation of chemicals, including cement products | -placement of fill  |
| -trenching                    | -parking of vehicle and plant                        | -lighting of fires  |
| -excavation for silt fencing  | -refuelling  | -soil level changes   |
| -cultivation                  | -dumping of waste                                    | -temporary or permanent installation of utilities and signs |
| -storage                      | -wash down and cleaning equipment                    | -physical damage to the tree                                |

#### Working within the TPZ

Works and activities within the TPZ must be supervised by the Project Arborist. Any additional encroachment that becomes necessary as the site works progress must be reviewed by the Project Arborist and be acceptable to the determining authority before being carried out. This includes landscaping, underground service installation and scaffolding.

#### Underground Services

- Underground services within Tree Protection Zones should be assessed by the project arborist at the design stage, and prior to the commencement of works.
- All underground services (including water, electricity, gas and telephone) should be located outside of the TPZ of trees to be retained.
- If underground services are to be routed within an established TPZ, they should be installed by directional boring with the top of the bore to be a minimum depth of 600mm below the existing grade.
- Bore pits should be located outside of the TPZ or manually excavated under the direct supervision of the Project Arborist.



### Tree Protection Plan

Address: Deakin Ave/O'Connor St, Haberfield NSW 2045  
 Base design: General Arrangement Plan (Drawing No. 82021192-01-C1010)  
 Projection: GDA 1994 MGA Zone 56  
 Drawn by: AMS Page: A3 Date: 26/10/2021

### Legend

- Trees
- Structural Root Zone (SRZ)
- Tree Protection Zone (TPZ)

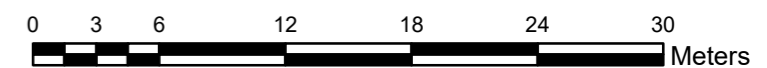


Table 1. Tree data

ID	Botanical name	Age	Health	Structure	ULE	Height (m)	Width (m)	DBH (cm)	DAB (cm)	TPZ (m)	SRZ (m)	Retention Value
3	<i>Lophostemon confertus</i>	Mature	Fair	Fair	20-40 years	13	12	90	124	10.8	3.62	High
4	<i>Lophostemon confertus</i>	Mature	Fair	Poor	10-20 years	9	12	67	108	8.04	3.41	Medium
5	<i>Lophostemon confertus</i>	Mature	Fair	Fair	20-40 years	13	13	68	103	8.16	3.35	High
6	<i>Lophostemon confertus</i>	Mature	Fair	Fair	20-40 years	14	12	93	127	11.16	3.65	High
7	<i>Lophostemon confertus</i>	Mature	Good	Fair	20-40 years	14	14	101	140	12.12	3.81	High
8	<i>Lophostemon confertus</i>	Mature	Fair	Fair	10-20 years	13	13	91	114	10.92	3.49	Medium
9	<i>Lophostemon confertus</i>	Mature	Poor	Poor	1-5 years	8	8	57	83	6.84	3.06	Low
13	<i>Butia capitata</i>	Mature	Good	Fair	10-20 years	6	4	46	34	3.00	2.10	Medium
14	<i>Butia capitata</i>	Mature	Fair	Fair	10-20 years	8	5	58	83	3.50	3.06	Medium
18	<i>Lophostemon confertus</i>	Semi mature	Fair	Fair	20-40 years	5	4	17	28	2.04	1.93	Low
19	<i>Lophostemon confertus</i>	Mature	Fair	Fair	40+ years	7	7	31	37	3.72	2.17	Medium

## Appendix 1. Data Collection Definitions & Descriptors

Tree assessments are based on the assessor's experience and opinion of the tree.

### 1.1 Botanical name

The scientific name identifying the genus and species of the tree. Each species has only one scientific name.

### 1.2 Common Name

The colloquial name for a tree species, usually in plain English. Common names for a species are often local or regional and each species can have multiple common names.

### 1.3 Tree dimensions

Tree height and canopy width in metres (estimated unless stated otherwise).

### 1.4 DBH

Diameter of the trunk at breast height (1.4m above ground level) measured using a diameter tape. Used to calculate the Tree Protection Zone radius.

### 1.5 DAB

Diameter of the trunk above the root buttress, measured using a diameter tape. Used to calculate the Structural Root Zone radius.

### 1.6 Health

Category	Description
Very Good	The tree is demonstrating excellent or exceptional growth. The tree exhibits a full canopy of foliage and is free of pest and disease problems.
Good	The tree is demonstrating good or exceptional growth. The tree exhibits a full canopy of foliage, and has only minor pest or diseases problems.
Fair	The tree is in reasonable condition and growing well. The tree exhibits an adequate canopy of foliage. There may be some deadwood present in the crown. Some grazing by insects or possums may be evident.
Poor	The tree is not growing to its full capacity; extension growth of the laterals is minimal. The canopy may be thinning or sparse. Large amounts of deadwood may be evident throughout the crown. Significant pest and disease problems may be evident or there may be symptoms of stress indicating tree decline.
Very Poor	The tree appears to be in a state of decline. The tree is not growing to its full capacity. The canopy may be very thin and sparse. A significant volume of deadwood may be present in the canopy or pest and disease problems may be causing a severe decline in tree health.
Dead	The tree is dead.

## 1.7 Structure

Category	Description
Good	The tree has a well-defined and balanced crown. Branch unions appear to be sound, with no significant defects evident in the trunk or the branches. Major limbs are well defined. The tree is considered a good example of the species.
Fair	The tree has some minor problems in the structure of the crown. The crown may be slightly out of balance, and some branch unions may be exhibiting minor structural faults. If the tree has a single trunk, it may be on a slight lean or exhibiting minor defects.
Poor	The tree may have a poorly structured crown. The crown may be unbalanced or exhibit large gaps. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. The tree may have suffered root damage.
Very Poor	The tree has a poorly structured crown. The crown is unbalanced or exhibits large gaps with possibly large sections of deadwood. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. Branches may exhibit large cracks that are likely to fail in the future. The tree may have suffered major root damage.
Has Failed	A section of the tree has failed or is in imminent danger of failure and the tree is no longer a viable specimen.

## 1.8 Age Class

Category	Description
Mature	Tree has reached the expected size for the species at the site.
Semi-mature	Established tree that has not yet reach the expected size for the species at the site.
Young	Recently planted tree or juvenile self-sown tree (generally less than 5 years old).

## 1.9 Useful Life Expectancy (ULE)

Category	Description
40+ years	The tree is in excellent condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component in excess of 40 years.
20 - 40 years	The tree is in good condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component for 20-40 years.
10 - 20 years	The tree is in fair condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component for 10-20 years.
5 - 10 years	The tree is in fair to poor condition or it is not a long lived species. Removal and replacement may be required within the next 10 years.
1 - 5 years	The tree is in poor condition due to advanced decline or structural defect. Removal and replacement may be required within the next 5 years.
0 years	The tree is dead, or is considered hazardous in the location. Removal may be required.

## 1.10 Tree Origin

Category	Description
Exotic	The species originates in a country other than Australia.
Australian Native	The species originates within Australia.
NSW Native	The species originates within NSW.

## 1.11 Tree Retention Value

Term	Description
Very High	Tree of exceptional quality in good condition. A prominent landscape feature and/or of historic, cultural, ecological or other significance. Has the potential to be a medium to long-term landscape component where managed appropriately. All efforts should be made to retain the tree and protect from construction impact.
High	Tree of high quality in good to fair condition. Generally a prominent landscape feature. Has the potential to be a medium to long-term landscape component where managed appropriately. All efforts should be made to retain the tree and protect from construction impact.
Medium	Tree of moderate quality in fair condition. Generally a modest landscape feature. May have a health or structural issue that can be resolved with arboricultural input, or may refer to a medium to small tree in good condition. Has the potential to be a medium to long-term landscape component where managed appropriately. Where practical, design modifications should be considered in order to retain and protect from construction impact.
Low	Either: Tree of low quality in poor condition. Generally provides little amenity value. Unlikely to be a long or medium term landscape component. The tree may be considered a weed species, structurally unsound, dead/dying/diseased, nearing the end of its ULE or may not be suitable for the site. Or: small tree of good or fair condition which is easily replaced in the landscape through planting of advanced stock.
Third party ownership	The tree is located outside of the subject site and is owned by a third party. It may be owned by a private entity (residential) or public body (council). Third party owned trees must be retained and protected from construction impact, unless a mutually acceptable outcome is negotiated with the tree owner and relevant authorities.