



Tree Management Strategies

Arboricultural Impact Assessment



41 WYUNA AVENUE
FRESHWATER
16-11-22

Leigh Brennan
Tree Management Strategies

E leigh@treems.com.au

t 0447 356 059

u leigh@treemanagementstrategies.com.au

Dip Horticulture
Dip Arboriculture
Cert IV Business Management

ABN 504 8330 4596



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Summary

Tree Management Strategies have been commissioned by Scott Thornton to provide an Arboricultural Impact Assessment (AIA) for two trees located on the council verge at 41 Wyuna Avenue, Freshwater, NSW refer to (Figure 1). The AIA was requested by Northern Beaches Council on the 29-9-22.

This report aims to:

- Assess the health and vitality of two trees.
- Calculate the impact the proposed development will have on two trees.
- Suggest sensitive construction or tree protection methods to retain high to medium value trees on the subject site or neighbouring site.
- Recommend the retention or removal of the subject tree.

The Health, Condition and Retention values of two trees are recorded in the Tree Data Schedule (Appendix 1) and shown in the Tree Impact Plan (Appendix 2).

The developmental Impacts are explored in Developmental Impact and Observations (Section 2) of this report.

Conclusion

Trees 1 and 2 have major impacts to their TPZ's, however will remain healthy with the appointment of a project arborist to supervise all excavations and ensure adequate tree protection measures are adhered to. *Lophostemon confertus* are adaptability to changes in their growing environment will remain healthy and viable into the future.

Recommendations

Adhere to the Tree Management Plan (Section 3) of this report to ensure the ongoing health of Trees 1 and 2.

1. Introduction

Tree Management Strategies have been commissioned by Scott Thornton to provide an Arboricultural Impact Assessment (AIA) for two trees located on the council verge at 41 Wyuna Avenue, Freshwater, NSW refer to (Figure 1). The AIA was requested by Northern Beaches Council on the 29-9-22.

The proposed development involves the demolition of the existing building, construction of new dwelling and associated landscape and stormwater design.

Northern Beaches Council is the consenting authority for the development.

This report aims to:

- Assess the health and vitality of two trees.
- Calculate the impact the proposed development will have on two trees.
- Suggest sensitive construction or tree protection methods to retain high to medium value trees on the subject site or neighbouring site.
- Recommend the retention or removal of the subject tree.

Figure 1: Subject Site highlighted in red



2. Developmental Impacts and Observations

The Health, Condition, Retention values and photographs of two trees are recorded in the Tree Data Schedule (Appendix 1) and shown in the Tree Impact Plan (Appendix 2).

The method for this report is outlined in (Appendix 3) Method.

All tree values are in accordance with IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©.

The tree impacts detailed below are based on the plans referenced in (Section 4) of this report.

The incursions to the theoretical Tree Preservation Zones (TPZ) potentially affecting trees assessed on the subject site are shown in the Tree Impact Plan (Appendix 2).

Tree 1 is given a medium retention value due to its age, habit, species and position in the landscape. Tree 1 has a major incursion of 22.99% to its TPZ by the level change within the site, the stormwater alignment and new driveway alignment, refer to the Tree Impact Plan (Appendix 2). The impact to Tree 1 is deemed acceptable with the appointment of a project arborist to supervise excavation within the TPZ of Tree 1 and adequate tree protection measures allowed for, refer to the Tree Management Plan, (Section 3) of this report.

Tree 2 is given a medium retention value due to its age, habit, species and position in the landscape. Tree 1 has a major incursion of 10.31% to its TPZ by the level change within the site, the stormwater alignment and new driveway alignment, refer to the Tree Impact Plan (Appendix 2). The impact to Tree 2 is deemed acceptable with the appointment of a project arborist to supervise excavation within the TPZ of Tree 2 and adequate tree protection measures allowed for, refer to the Tree Management Plan, (Section 3) of this report.

3. Tree Management Plan

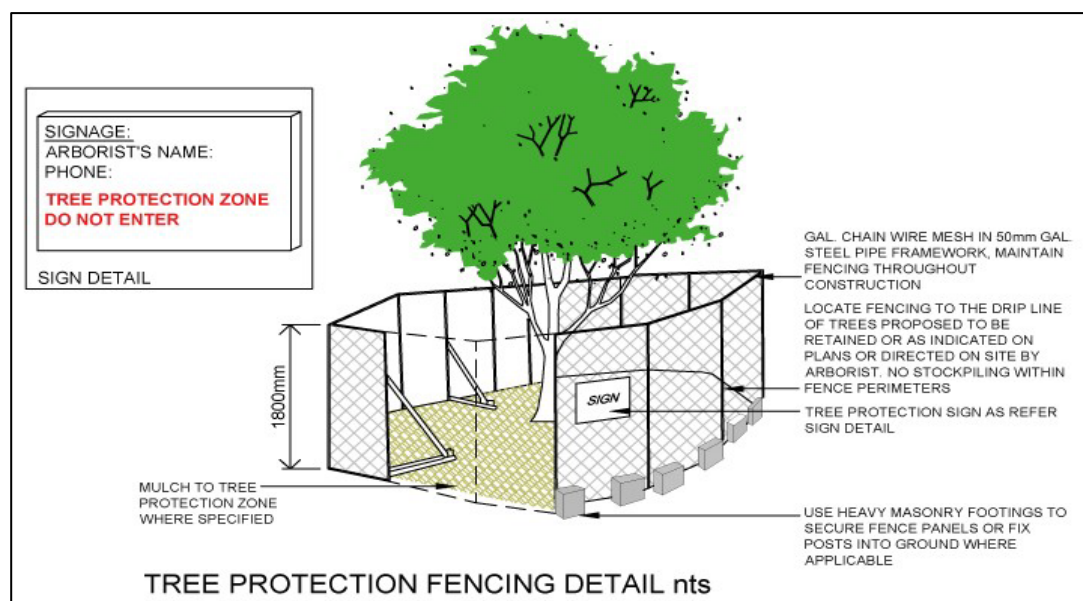
The Tree Management Plan is designed to offer detailed design modifications or sensitive construction methods and a step-by-step timeline for Tree Protection Measures.

Step 1: Tree Protection Fence

To ensure the protection of trees affected by the proposed development a Tree Protection Fence is required for Trees 1 and 2 as per the detail outline in (Figure 2).

The Tree Protection Fence needs to be erected throughout construction and may be dismantled when landscaping begins. The Project Arborist must certify the protection measures are in the correct location and to specification prior to the commencement of construction.

Figure 2: Tree Protection Detail



Step 2: Driveway Excavation

The proposed driveway excavation within the TPZ of Trees 1 and 2 must be done under the supervision of the Project Arborist. 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 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 (CSA 2009).

Step 3: Stormwater Installation

The proposed stormwater excavation within the TPZ of Trees 1 and 2 must be done under the supervision of the Project Arborist. 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 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 (CSA 2009).

Step 4: Boundary Level Change

The proposed boundary level change excavation within the TPZ of Trees 1 and 2 must be done under the supervision of the Project Arborist. 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 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 (CSA 2009).

Step 5: Monitoring

The Project Arborist must inspect all trees to be retained bi-monthly to ensure tree protection measures are being adhered to and the health of all trees is not being adversely affected.

Step 6: General Exclusions within the TPZ

- The following activities shall be excluded within the TPZ:
- Excavation, compaction or disturbance of the existing soil.
- The movement or storage of materials, waste or fill.
- Soil level changes.
- Disposal and runoff of waste materials and chemicals including paint, solvents, cement slurry, fuel and oil.
- Other toxic liquids.
- Movement or storage of plant, machinery, equipment or vehicles.
- Any activity likely to damage the trunk, crown or root system of the trees.

The Project Arborist must be notified in the event any disturbance within the TPZ of trees to be retained is required.

Step 7: Final Certification

Upon completion of construction the Project Arborist will certify that the health and condition of all trees to be retained have not been adversely affected by the development.

4. Referenced Documents

Plans that were referred to for this report include:

| Plan Title | Drawing Number | Consultant | Revision | Job/ Number |
|--------------------|-----------------------|----------------------------|------------------|--------------------|
| Tree Impact Plan | Fre.TIP.01 | Tree Management Strategies | 9-11-22 | |
| Storm Water | D01 to D05 | NB Consulting Engineers | 8-11-22 Rev B | |
| Architectural Plan | TH-03-DA | Rachel Hudson Architect | 1-11-22 | |

5. Conclusions & Recommendations

Conclusion

Trees 1 and 2 have major impacts to their TPZ's, however will remain healthy with the appointment of a project arborist to supervise all excavations and ensure adequate tree protection measures are adhered to. *Lophostemon confertus* are adaptability to changes in their growing environment will remain healthy and viable into the future.

Recommendations

Adhere to the Tree Management Plan (Section 3) of this report to ensure the ongoing health of Trees 1 and 2.

6. References

Shigo, A., 1986, A New Tree Biology and Dictionary: facts, photos, and philosophies on trees and their problems and proper care, Snohomish, WA

Council of Standards Australia (August 2009)
The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009).

Harris, R., Clark, J., Matheny, N., 2003, Integrated Management of Landscape Trees, Shrubs, and Vines, fourth edition, Prentice Hall, Australia

IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

Disclaimer:

By the nature of their size, weight and miscellaneous structure, constant exposure to the weather and the elements, susceptibility to insects, pest and decay organisms, and trees always pose an inherent degree of hazard and risk from breakage or failure.

There is no guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future. No responsibility will be accepted for partial or full failure of any tree.



No responsibility will be accepted for any damage or injury caused by any tree or part thereof referred to in this report.

While great care is taken to accurately diagnose the condition of a tree, it is impossible to accurately determine the true structural condition of the entire tree and any diagnosis, opinions or recommendations expressed are based on several methods of determining tree health.

7. Appendices

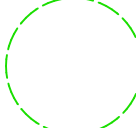

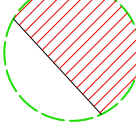


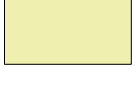

Appendix 1: Tree Data Schedule

APPENDIX 1 – TREE DATA SCHEDULE

| No | Genus-species | Common Name | DAB metres (radius) Above Buttress | DBH metres (radius) Breast Ht | SRZ (radius) Metres | TPZ (radius) Metres | Height Metres | Age Young, Semi- Mature, Mature Over Mature | Canopy Spread (Metres) (radius) | Health Good Fair Fair/Poor Poor Dead | Condition Good Fair Fair/Poor Poor Failed | Useful Life Expectancy High Medium Low | Landscape significance High Medium Low | Retention value High Medium Low | Notes | Photo |
|----|-----------------------|-------------|--|---|---------------------------|---------------------------|------------------|---|--|---|--|--|--|---|-------|---|
| 1 | Lophostemon confertus | Brush Box | 0.78 | 0.57 | 2.98 | 6.84 | 12.00 | Mature | 6.00 | Fair | Fair/Poor | Medium | Medium | Medium | | <div><div>Oct 20, 2022 11:43:48 am</div><div>1</div></div> |
| 2 | Lophostemon confertus | Brush Box | 0.64 | 0.55 | 2.74 | 6.60 | 15.00 | Mature | 6.00 | Fair | Fair | Medium | Medium | Medium | | <div><div>Oct 20, 2022 11:45:07 am</div><div>2</div></div> |

Appendix 2: Tree Impact Plan

Legend

-  TPZ - Tree Protection Zone
-  SRZ - Structural Root Zone
-  Incursion Zone
-  Proposed Dwelling
-  Proposed Drive
-  Proposed Landscape
-  Stormwater

Incursion




T01

SRZ = No Incursion
 TPZ = 146.91sqm
 Incursion (Drive, Stormwater, Landscape)= 33.77sqm
 TOTAL Incursion = 22.99%

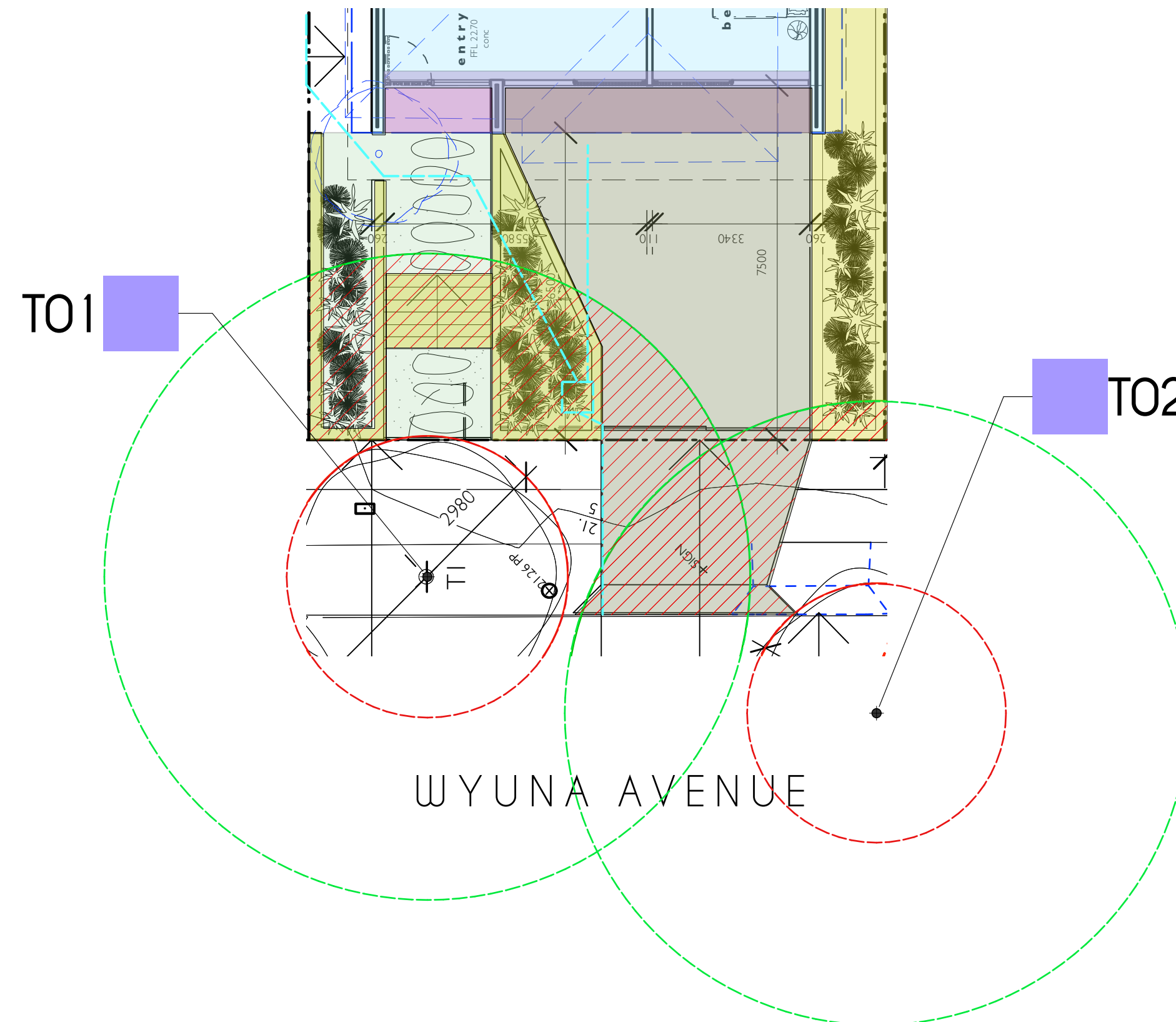
T02

TPZ = 136.45sqm
 Incursion (Drive, Landscape)= 14.07sqm
 Incursion % = 10.31%

Retention Value

-  High
-  Medium
-  Low

Tree Impact Plan - Appendix 2



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Tree Management Strategies



| | | | | |
|---|-------------|--------------|---|------------------|
| DATE: 16/11/2022 | DWG: FRT001 | REVISION: 01 | SCALE: @ A2 1:100 | DRAWN: Mark Hill |
| ADDRESS: 41 Wyuna Avenue | | | | |
| PLAN TITLE: Freshwater Tree Impact Plan | | | | |
| Tree Management Strategies | | | Sydney & Regional NSW | |
| W: www.treemanagementstrategies.com.au | | | T: 0447 356059 E: leigh@treemanagementstrategies.com.au | |

Appendix 3: Method

Site Assessment

From the ground, the following information was recorded and displayed in the Tree Data Schedule (Appendix 1).

- Tree genus and species.
- Approximate height spread if deemed applicable.
- Trunk diameter at breast height and above the buttress.
- Age class: young, semi mature, mature, over mature.
- Health.
- Condition.

Observations were recorded and photographed.

Research

The following legislation, documents or websites were reviewed:

- The Australian Standard for the Protection of Trees on Development Sites (AS 4970 – 2009).
- The Northern Beaches Council Development Control Plan 2020.
- The Northern Beaches Council Local Environmental Plan 2019.

Tree Data Schedule Method

The Health and Condition of Trees 1 and 2 are shown in the Tree Data Schedule (**Appendix 1**) with the methods explained below:

Tree Health

| | |
|---|---|
| Overall Health (Vigour/Vitality) | Tree vigour is exhibited by crown density, crown cover, leaf colour, leaf size, leaf texture, presence of epicormic growth, ability to withstand predation by pest and disease, resistance and degree of dieback. |
| Good (Excellent) | Good tree vigour exhibited by no decline in overall health and vigour, height and shape. The specimen is observed to be of excellent condition displaying characteristics that is known for that particular species (what would be the expected condition for that particular species of that age in that location), 0% dieback, full crown density, leaf health, no pest or disease present. |
| Fair | Fair tree vigour exhibited by moderate decline in overall health and vigour, height and shape. The specimen is observed to be of moderate condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), less than 10% dieback, 90% of crown foliage density, more than 90% leaf health, acceptable level of pest or disease is evident for the assessing arborist (where it is considered the tree's overall health or condition will not be affected or lead to irreversible decline from pest or disease). |
| Fair/Poor | Fair to poor tree vigour exhibited by considerable decline in overall health and vigour, height and shape. The specimen is observed to be of less than acceptable condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), 10-20% dieback, considerable foliage deficiencies, 70-90% foliage density, 70-90% leaf health, pest or disease infestation at acceptable thresholds for the assessing arborist (where it is considered the tree's overall health or condition will not be affected or lead to irreversible decline from pest or disease). |
| Poor | Poor vigour exhibited by substantial decline in overall health and vigour, height and shape. The specimen is observed to be of poor condition by not displaying characteristics adequately that is known for that particular species (what would be |

| | |
|------------------|--|
| | expected for that particular species of that age in that location), 20-30% dieback, considerable foliage deficiencies, 50-70% leaf health, pest or disease infestation at unacceptable infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease). |
| Very Poor | Very poor vigour exhibited by irreversible decline in overall health and vigour, height and shape. The specimen is observed to be of less than acceptable condition by not displaying characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), 15-50% dieback; severe foliage deficiencies; 30-50% density; 30-50% leaf health; pest or disease infestation at severe infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease). |
| Dead | Dead tree vigour exhibited by complete decline in overall health and vigour, height and shape. The specimen is observed to be dead by not displaying any characteristics adequately that is known for that particular species (what would be expected for that particular species of that age in that location), tree holds less than 15% foliage; branching is dead throughout canopy, pest or disease infestation at severe infestation level that exceeds thresholds for the assessing arborist (where it is considered the tree's overall health or condition will be affected or lead to irreversible decline from pest or disease). |

Tree Condition

| Overall Condition (Structure/Stability) | The tree condition as identified by the arborist in regard to defects in structure and stability. |
|---|---|
| Good (Exceptional specimen) | No damage or decay observed to the root plate, visible basal and /or root flare, stable in ground, well tapered branches with sound open unions. All characteristics within thresholds for the assessing arborist. |
| Fair (Standard tree – no observable major defects to suggest that there is an increased likelihood of tree or part of tree failure) | Minor damage or decay observed to root plate, trunk or primary branches or branch unions (1 st or 2 nd branch order or scaffolding branch), well-formed branch unions, minor branch end weight or over-extensions within thresholds for the assessing arborist. |
| Fair/Poor | Moderate damage or decay observed to root plate, trunk or primary branches or branch unions (1 st or 2 nd branch order or scaffolding branch); minimal basal/root flare; acute branch; past branch failure(s); moderate branch end-weight or over-extension approaching thresholds for the assessing arborist. |
| Poor | Major damage or decay observed to root plate, trunk or primary branches or branch unions (1 st or 2 nd branch order or scaffolding branch) no observable basal and /or root flare; acute branch unions starting to include bark; major branch end-weight or over-extension at or exceeds thresholds for the assessing arborist. |
| Very Poor | Excessive damage or decay observed to root plate, trunk, primary branch or branch unions (1 st or 2 nd branch order or scaffolding branch), excessive decay or hollows compromising the structural integrity, unstable in ground, excessive branch end-weight, included-bark unions, exceeding thresholds for assessing arborist. Failure probable. |
| Failed | Failure of root plate or trunk or primary branch or branch unions (1 st or 2 nd branch order or scaffolding branch) or active split between branch unions or severe damage to primary tree structure. |

Tree Retention Value Method

IACA Significance of a Tree, Assessment Rating System (STARS) © (IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the Tree Significance - Assessment Criteria and Tree Retention Value - Priority Matrix, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of High, Medium and Low significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria



High Significance in landscape

- The tree is in good condition and good vigour. The tree has a form typical for the species.
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age.
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered Ecological Community or listed on a council's Significant Tree Register.
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity.
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ - tree is appropriate to the site conditions.

Medium Significance in landscape

- The tree is in fair to good condition and good or low vigour.
- The tree has form typical or atypical of the species.
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area.
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street.
- The tree provides a fair contribution to the visual character and amenity of the local area.
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.

Low Significance in landscape

- The tree is in fair to poor condition and good or low vigour.
- The tree has form atypical of the species.
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings.
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area.
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen.
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ - tree is inappropriate to the site conditions.
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms.
- The tree has a wound or defect that has potential to become structurally unsound.
- Environmental Pest/Noxious Weed Species.
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/allergenic properties.
- The tree is a declared noxious weed by legislation.
- Hazardous and or Irreversible Decline.
- The tree is structurally unsound and/or unstable and is considered potentially dangerous.
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a mono-cultural stand in entirety.

Useful Life Expectancy (ULE)

Useful life expectancy (ULE) is a measure of a trees remaining lifespan regarding its health, condition and locality ULE categories were measured as:

- Long (greater than 40 years)
- Medium (between 15 and 40 years)
- Short (between 1 and 15 years)
- Dead

Tree Retention Value - Priority Matrix

| | | Significance | | | | |
|---|--------------------------|---|---|------------------------------|---|--|
| | | 1. High Significance in Landscape | 2. Medium Significance in Landscape | Significance in Landscape | 3. Low Environmental Pest / Noxious Weed Species | Hazardous / Irreversible Decline |
| Estimated Life Expectancy | 1. Long >40 years | | | | | |
| | 2. Medium 15-40 Years | | | | | |
| | 3. Short <1-15 Years | | | | | |
| | Dead | | | | | |
| <p>Legend for Matrix Assessment</p> <p>Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.</p> <p>Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.</p> <p>Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.</p> <p>Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.</p> | | | | | | |

REFERENCES

- Australia ICOMOS Inc. 1999, *The Burra Charter – The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia
- Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturist (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.
- Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au

Tree Protection Zone and Structural Root Zone Method

Following the VTA, The Tree Preservation Zones and Structural Root zones were calculated and added to the Tree Data Schedule (Appendix 1) and the Tree Impact Plan (Appendix 2) with the methods explained below:

The Structural Root Zone (SRZ) is the area around the base of a tree required for its stability. The woody root growth and soil cohesion in this area are necessary to hold the tree upright; therefore, there are no variations to its size. The SRZ is normally circular with the trunk at its centre and is expressed by its radius in metres (AS – 4970). Due to the potential of causing instability of a tree, it is highly recommended that no roots within its SRZ are pruned or removed. SRZ, which is the area required for tree stability, was calculated as follows: SRZ radius = $(D \times 50) 0.42 \times 0.64$.

The Tree Protection Zone (TPZ) is the principle means of protecting trees on development sites. The TPZ is a combination of the root area and crown area that requires protection. It is an area isolated from construction disturbance, so that the tree remains viable (AS – 4970). The radius of the TPZ is calculated for each tree by multiplying its DBH x 12. TPZ = DBH x 12 (DBH = trunk diameter measured at 1.4m above ground level). The radius of the TPZ is measured from COT (Centre of the trunk).

Variations to the Tree Protection Zone (TPZ)

General

It may be possible to encroach into or make variations to the standard TPZ. Encroachment Includes excavation, compacted fill and machine trenching.

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. Variations must be made by the project arborist considering relevant factors. (Figure 3) demonstrates some examples of possible encroachment into the TPZ up to 10% of the area.

Major encroachment

If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ the project arborist must demonstrate that the tree(s) would remain viable. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors listed in the Clause.

Figure 3

