



# ARBORICULTURAL IMPACT ASSESSMENT (CONCEPT)

The Edgecliff Centre-New South Head Rd, Edgecliff.

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# 1 Summary

- This report has been commissioned by Longhurst Investments No.1 P/L to survey and assess the trees surrounding the proposed development area shown in figure 1.
- A preliminary pre-development tree assessment report was completed by Truth About Trees at the subject site in May 2019. Elements from this preliminary assessment will be referenced and included within this report.
- A total of thirty-three (33) trees were assessed in relation to the proposed development.
- The trees were assessed using elements of the Visual Tree Assessment technique (VTA).
- The trees had retention values allocated in accordance with the Significance of a Tree Assessment Rating System (STARS).
- Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) were calculated in accordance with AS4970-2009- The Protection of Trees on Development Sites.
- No trees were allocated a high retention value using the STARS system, however, trees 1-6 along New South Head Road are clearly the most significant trees on site.
- A total of twelve (12) trees were allocated a medium retention value (1-2-3-4-5-6-11-13-14-16-29-30), although trees 13-14 & 16 achieved this rating purely due to having long remaining lifespans as opposed to any landscape significance.
- The concept proposal would enable the retention of seventeen (17) trees including ten (10) trees of medium retention value, six (6) of low retention value and one (1) of very low retention value, however, this report recommends additional tree removal related to the poor condition or unsuitability of certain trees and unrelated to the development.
- Following close inspection, further assessment and consideration of the desired future character of the site, it was determined that there were only eight (8) trees which warranted significant efforts to retain. The remaining trees could all be easily and reliably replaced within a refreshed landscape setting that such a development will require.
- Once designs have been progressed, a further Arboricultural Impact Assessment will be required to ensure that the trees proposed for retention remain viable in the context of the development.
- A detailed site-specific tree protection plan and Arboricultural Method statement will be required to specify how the trees for retention will be protected and maintained throughout all stages of demolition and construction.
- Trees 1-2-3-4-5 & 6 are of great importance to the site, the Arboricultural Method Statement must specify how the effects of increased wind loading are to be managed once the existing building is demolished. This is likely to require input from the contractors completing the demolition and construction.
- Trees 1-2-3-4-5-6-11 & 30 should be retained and protected throughout development, the remaining trees should not be considered as a constraint to development.

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## 2 Introduction & aim

This report has been commissioned by Longhurst Investments No.1 P/L to survey and assess the trees surrounding the proposed development area shown in figure 1 below. A preliminary concept drawing (Ground Floor Plan) has been provided to Truth About Trees by Longhurst Investments No.1 P/L to demonstrate the level of development which is desired for the site. A preliminary pre-development tree assessment report was completed by Truth About Trees at the subject site in May 2019. Elements from this preliminary assessment will be referenced and included within this report.

This report will identify all trees within and directly adjacent to the site which are likely to be impacted by the proposed works and will provide details regarding their retention values, tree protection requirements and any additional information to assist with design decisions. This report is only in relation to the proposed concept and can only comment on the likely impacts imposed by the bulk and scale of the proposed development as many other details need to be finalized through the design process. The correspondence shown in italics below has been received from council following initial contact by Longhurst Investments No.1 P/L. *A request for a planning proposal, regardless of the scale, must have regard to Council's desired future character objectives and controls relating to trees, specifically Chapter E3 Tree Management of Woollahra DCP 2015. The applicant must engage an arboricultural consultant early in the planning phase to determine the retention value of all of the existing trees and vegetation, especially along New South Head Road. Setbacks for tree planting and landscape can be identified and used to guide the constraints and opportunities analysis of the site and inform building envelope controls.* This report will aim to satisfy the above comments from council.

The trees will be assessed in regard to their current health and vigour, structural condition, estimated remaining lifespan and significance within the landscape.



Figure 1- The Edgecliff Centre with approximate site boundaries dotted red. Image from Near Maps.<sup>1</sup>

<sup>1</sup> Near Maps 2020- The Location of the Edgecliff Centre- Near Maps 2020.

### 3 Method

Assessments of the trees were made using elements of the ‘Visual Tree Assessment’ procedure- VTA – see appendix 1. The trees were inspected and had Tree Protection Zones and Structural Root Zones calculated in accordance with AS4970-2009- The Protection of Trees on Development Sites<sup>2</sup> -see appendix 2. Tree Retention Values were determined using the ‘Significance of a Tree, Assessment Rating System STARS<sup>3</sup> – see appendix 3. The trees were assessed from the ground initially in April 2019 for the preliminary assessment and subsequently on Monday August 31, 2020 for the purpose of this report.

- No internal diagnostic testing has been completed.
- No sub surface root testing or soil testing has been completed.
- All observations were made from the ground only.
- Tree heights and canopy spreads have been estimated.
- Tree diameter at breast height (DBH) and diameter above buttress (DAB) have been measured with a diameter tape where access allowed.
- Tree protection zones (TPZ) and structural root zones (SRZ) have been calculated in accordance with AS4970-2009.

#### 3.1 Document schedule

The drawings which have been provided to me and relied upon for this assessment are:

- Design drawing- Concept Ground Floor
- Design drawing- 20B1- Basement 1 plan
- Design drawing- 20B2- Basement 2 plan
- Design drawing- 20B3- Basement 3 plan
- Design drawing- 20B4- Basement 4 plan
- Design drawing- 20B5- Basement 5 plan
- Design drawing- 20B6- Basement 6 plan
- Design drawing- 20B7- Basement 7 plan
- Design drawing- 20B8- Basement 8 plan

Other documents considered during assessment:

AS4970-2009 The Protection of Trees on Development Sites.

AS4373-2007 The Pruning of Amenity Trees.<sup>4</sup>

#### 3.2 Tree management controls

For the purpose of this report, all trees greater than 5m in height or with a canopy spread of greater than 3m have been assessed and included within this report.

Where ‘weed species’ is referenced, this refers to species which are classified as weeds within the Department of Primary Industries (DPI) weedwise NSW framework or listed as exempt species within Chapter E3 Tree Management of Woollahra DCP 2015.

<sup>2</sup> Standards Australia- AS4970-2009- *The Protection of Trees on Development Sites*.

<sup>3</sup> IACA- *Significance of a Tree Assessment Rating System (STARS)*

<sup>4</sup> Standards Australia- AS4373-2007- *The Pruning of Amenity Trees*

## 4 Site proposal

Figure 2 (below) shows the subject site boundaries are shown in red and the proposed development footprint is shown in yellow.



Figure 2- The proposed development footprint shown in yellow with the existing footprint shown in red dotted line, the trees proposed for retention are also shown and numbered. Image provided by the client.

The proposed development seeks to demolish the existing building shown with red dotted line. The trees proposed for retention are shown on the drawing and numbered in accordance with the tree schedule located in section 6 of this report. There will be discussion provided within section 8 of this report which will discuss the potential impacts upon these trees and also whether the trees are worthy of retention or whether in the interest of design or site functionality, they should be removed and replaced.

The image above is a concept drawing which will be referenced within this report.

PLEASE NOTE: Trees 27-28-29 & 30 are not shown on this drawing but are proposed for retention.

## 5 Existing Site Conditions and tree locations



Figure 3- Tree numbers and locations- Green ring = TPZ, Red ring = SRZ, Yellow dot = Medium retention value, Blue dot = Low retention value, Green dot = V. Low retention value . Image from Near Maps 2019.<sup>5</sup>

<sup>5</sup> Near Maps- The locations of the trees- Near Maps 2019.

## 6 Tree schedule

Table 1- Tree schedule

Tree #	Species	Height	Canopy spread	TPZ	SRZ	Health + vigour	Structure	Defects	Significance	E.L. E	Retention Value	Comments
1	<i>Eucalyptus microcorys</i> -Tallowwood	17	9x9	7.8	3.0	Fair	Fair	Epicormic growth, deadwood	Medium	Medium	Medium	Buttress roots toward building- 4m to centre of tree
2	<i>Eucalyptus microcorys</i> -Tallowwood	17	15x12	8.9	3.2	Fair	Fair	Major deadwood, significant lean over road, epicormic growth,	Medium	Medium	Medium	Tree health has improved significantly since previous visit.
3	<i>Eucalyptus microcorys</i> -Tallowwood	17	10x10	7.1	3.0	Fair	Fair	Major deadwood, epicormic growth, termite workings	Medium	Medium	Medium	
4	<i>Eucalyptus microcorys</i> -Tallowwood	14	10x10	6.8	2.8	Fair	Fair	Major deadwood, root damage roadside.	Medium	Medium	Medium	
5	<i>Eucalyptus microcorys</i> -Tallowwood	14	7x7	5.3	2.7	Fair	Fair	Epicormic growth, deadwood	Medium	Medium	Medium	Slight lean towards road
6	<i>Eucalyptus microcorys</i> -Tallowwood	12	9x9	6.5	2.9	Fair	Fair	Epicormic growth, stubs	Medium	Medium	Medium	Small leaves
7	<i>Melaleuca bracteata</i> -Black Tea Tree	6	4x4	2.3	2.1	Poor	Fair	Sparse	Low	Short	Low	
8	<i>Callistemon salignus</i> -Willow Bottlebrush	6	5x3	2.2	1.8	Poor	Fair	Sooty mould	Low	Short	Low	
9	<i>Eucalyptus botryoides x saligna</i> -Wollongong Woollybutt	13	12x12	8.6	2.8	Good	Poor	Major root damage, Termite activity, co-dominant form @ 1.6m	Medium	Short	Low	
10	<i>Celtis sinensis</i> -Chinese Hackberry	8	8x8	3.6	2.4	Good	Poor	Environmental weed	Low	Medium	Low	Exempt due to species and size-undesirable species
11	<i>Eucalyptus botryoides x saligna</i> -Wollongong Woollybutt	23	20x20	14.3	3.6	Good	Fair	Large hanger in central canopy, major deadwood	Medium	Medium	Medium	Branches extending over existing building line
12	<i>Acacia binervia</i> -Coast Myall	4	2x2	2.0	1.5	Fair	Fair	Sparse	Low	Short	Low	
13	<i>Araucaria heterophylla</i> -Norfolk Island Pine	8	4x4	2.3	1.8	Good	Good	Wound @ 3m	Low	Long	Medium	

Tree #	Species	Height	Canopy spread	TPZ	SRZ	Health + vigour	Structure	Defects	Significance	E.L. E	Retention Value	Comments
14	<i>Jacaranda mimosifolia</i> - Jacaranda	6	4x4	2.0	1.8	Good	Fair		Low	Long	Medium	
15	<i>Acacia binervia</i> - Coast Myall	6	4x2	2.4	1.9	Dead	Poor		Low	Remove	V. Low	Exempt due to being dead
16	<i>Radermachera sinensis</i> - China Doll	6	2x2	2.0	1.5	Good	Good		Low	Long	Medium	Growing against building
17	<i>Acacia binervia</i> - Coast Myall	4	6x2	2.6	2.0	Poor	Hazard	Almost dead, significant decay and lean	Low	Remove	V. Low	Root system has partially failed, remove regardless of development
18	<i>Morus sp.</i> - Mulberry	5	3x3	2.4	1.8	Fair	Fair		Low	Short	Low	
19	<i>Eucalyptus botryoides</i> - Bangalay	8	5x2	2.4	1.9	Fair	Poor	Suppressed lean over road, root system compromised by Ficus	Low	Short	Low	
20	<i>Casuarina glauca</i> - Swamp Oak	9	4x2	2.4	2.0	Fair	Fair	Root system compromised by Ficus	Low	Short	Low	
21	<i>Ficus coronata</i> - Sandpaper Fig	5	7x7	2.6	2.0	Good	Fair	Minor root damage	Low	Medium	Low	
22	<i>Eucalyptus botryoides</i> - Bangalay	14	6x9	3.7	2.2	Good	Poor	Suppressed lean over ramp	Low	Short	Low	
23	<i>Celtis sinensis</i> - Chinese Hackberry	8	4x4	2.5	1.8	Good	Poor	Environmental weed	Low	Medium	Low	Exempt due to species and size-undesirable species
24	<i>Eucalyptus botryoides</i> - Bangalay	25	23x20	9.1	3.2	Poor	Fair	Major deadwood, declining health, significant lean over ramp	Medium	Short	Low	Major roots against existing building
25	<i>Celtis sinensis</i> - Chinese Hackberry	7	2x2	2.0	1.5	Good	Fair	Environmental weed	Low	Remove	Low	Exempt due to species and size-undesirable species
26	<i>Ulmus parvifolia</i> - Chinese Elm	8	5x5	3.5	2.2	Fair	Fair	Deadwood and stubs, growing in finger bed	Low	Medium	Low	
27	<i>Ulmus parvifolia</i> - Chinese Elm	7	4x4	3.4	2.1	Fair	Fair	Deadwood and stubs, previous failures	Low	Short	Low	
28	<i>Eucalyptus scoparia</i> - Wallangarra White Gum	8	4x4	3.4	2.2	Poor	Poor	Advanced decline	Low	Remove	V. Low	
29	<i>Lophostemon confertus</i> - Brush box	12	6x6	5.3	2.6	Fair	Fair	Corrected lean, poor pruning, yellowing foliage	Medium	Medium	Medium	
30	<i>Casuarina cunninghamiana</i> - River Oak	18	8x8	6.0	2.9	Fair	Fair	Deadwood	Medium	Medium	Medium	

Tree #	Species	Height	Canopy spread	TPZ	SRZ	Health + vigour	Structure	Defects	Significance	E.L. E	Retention Value	Comments
31	<i>Casuarina glauca</i> -Swamp Oak	9	2x2	2.0	1.5	Good	Fair	Growing against building	Low	Short	Low	
32	<i>Casuarina glauca</i> -Swamp Oak	9	2x2	2.0	1.7	Good	Fair	Stubs and dead branches	Low	Short	Low	400mm from retaining wall
33	<i>Casuarina glauca</i> -Swamp Oak	13	4x2	3.2	2.3	Good	Fair	Stubs, against building and retaining wall	Low	Short	Low	500mm from building 100mm from retaining wall

7 Retention values in accordance with STARS (IACA).

Retention value	High Priority for retention	Medium Consider for retention	Low Consider for removal	Remove Priority for removal
Tree numbers	N/A	1-2-3-4-5-6-11-13-14-16-29-30	7-8-9-10-12-18-19-20-21-22-23-24-25-26-27-31-32	15-17-28

Table 2- Tree retention values in accordance with STARS.

## 8 Impact schedule based upon concept

Table 3- Impact schedule

Tree #	Impacts	Potential mitigation options
1	Demolition of existing building within TPZ of the tree and construction of new building.	Retain below ground structures adjacent to significant tree roots. Manage increased wind loading with temporary restraint systems or screening. Retain and protect.
2	Demolition of existing building within TPZ of the tree and construction of new building.	Retain below ground structures adjacent to significant tree roots. Manage increased wind loading with temporary restraint systems or screening. Retain and protect.
3	Demolition of existing building within TPZ of the tree and construction of new building.	Retain below ground structures adjacent to significant tree roots. Manage increased wind loading with temporary restraint systems or screening. Retain and protect.
4	Demolition of existing building within TPZ of the tree and construction of new building.	Retain below ground structures adjacent to significant tree roots. Manage increased wind loading with temporary restraint systems or screening. Retain and protect.
5	Demolition of existing building within TPZ of the tree and construction of new building.	Retain below ground structures adjacent to significant tree roots. Manage increased wind loading with temporary restraint systems or screening. Retain and protect.
6	Demolition of existing building within TPZ of the tree and construction of new building.	Retain below ground structures adjacent to significant tree roots. Manage increased wind loading with temporary restraint systems or screening. Retain and protect.
7	Demolition of existing building within TPZ of the tree and construction of new building.	Proposed for removal.
8	Demolition of existing building within TPZ of the tree and construction of new building.	Proposed for removal.
9	Demolition of existing building within TPZ of the tree and construction of new building.	Poor quality tree with poor structure. Recommended for removal regardless of development.
10	Demolition of existing building within TPZ of the tree and construction of new building.	Undesirable species. Recommended for removal regardless of development.
11	Demolition of existing building within TPZ of the tree and construction of new building.	Retain below ground structures adjacent to significant tree roots. Retain and protect. Will require significant efforts to retain through design to maintain soil levels and protect large surface roots.
12	Demolition of existing building within TPZ of the tree and construction of new building.	Not worth retaining. Recommended for removal regardless of development.
13	Demolition of existing building within TPZ of the tree and construction of new building.	Too close to building to achieve mature dimensions. Recommended for removal regardless of development.
14	Demolition of existing building within TPZ of the tree and construction of new building.	Proposed for removal. Too close to building to achieve mature dimensions- Recommended for removal regardless of development.
15	Demolition of existing building within TPZ of the tree and construction of new building.	Not worth retaining- Dead tree. Recommended for removal regardless of development.
16	Demolition of existing building within TPZ of the tree and construction of new building.	Not worth retaining- Too close to building to achieve mature dimensions- Recommended for removal regardless of development.
17	No Impacts from development	Hazardous - Recommended for removal regardless of development.

Tree #	Impacts	Potential mitigation options
18	No Impacts from development	Not worth retaining- Recommended for removal regardless of development.
19	No Impacts from development	Not worth retaining- Recommended for removal regardless of development.
20	No Impacts from development	Not worth retaining- Recommended for removal regardless of development.
21	No Impacts from development	Retain and protect only if desired, removal would provide greater space for construction activity and provide a clean slate for landscape design.
22	No Impacts from development	Not worth retaining- Recommended for removal regardless of development.
23	Demolition of existing building within TPZ of the tree and construction of new building.	Proposed for removal
24	Demolition of existing building within TPZ of the tree and construction of new building.	Proposed for removal
25	Demolition of existing building within TPZ of the tree and construction of new building.	Proposed for removal
26	Development likely to conflict with finger bed holding tree.	Remove
27	No Impacts from development	Unaffected by design. Not worth retaining- Recommended for removal regardless of development.
28	No Impacts from development	Unaffected by design. Not worth retaining- Recommended for removal regardless of development.
29	No Impacts from development	Unaffected by design. Retain only if desired. Tree presents very poorly with previous partial root plate failure. Tree has straightened but is of limited visual amenity. Recommended for removal regardless of development.
30	No Impacts from development	Unaffected by design. Retain and protect.
31	Impacts unclear at this stage	Proposed for removal- Recommended for removal regardless of development.
32	Impacts unclear at this stage	Proposed for removal- Recommended for removal regardless of development.
33	Impacts unclear at this stage	Proposed for removal- Recommended for removal regardless of development.

## 9 Trees proposed for retention

A total of eighteen (18) of the thirty-three (33) trees assessed for this report are proposed for retention. Under the existing concept, seventeen (17) of these trees appear to be retainable with only tree twenty-six (26) possibly requiring removal due to potential conflicts with users of the road reserve. Ten (10) of the trees (1-2-3-4-5-6-9-11-12-13) are located in close proximity to the existing building, the retention of these trees will require a detailed Arboricultural Method Statement and site-specific tree protection plan. The site Arborist will have to be engaged to assist with early stage planning and design so that the trees can be appropriately managed through demolition and construction. It seems highly likely that some sections of the existing building adjacent to these trees may need to be retained in situ below ground level. This will be the case with trees 1-2-3-4-5 & 6, with no alterations proposed adjacent to these trees. These trees will also

be impacted by unfamiliar wind patterns created once the existing building is demolished. Trees 1-6 are Woollahra Council street trees located in front of the existing building on New South Head Road. Whilst the trees have been allocated medium retention value using the STARS system, Edgecliff station is of local heritage significance and these trees create an important visual link between the streetscape and the existing building so it could be argued that this row of trees is of higher landscape significance.

Tree nine (9) is a poorly formed, suppressed Eucalypt with poor structural condition which does not warrant significant efforts to retain. This tree is recommended for removal.

Tree eleven (11) is a large mature Eucalypt street tree located on the south-western corner of the existing building, the concept design appears to have created a set-back from the trees canopy to enable it to be retained within the development, the same level of care will need to be used when managing the trees root system which is extensive.

Tree twelve (12) is a semi-mature Acacia which is of low retention value and not worthy of significant attempts to retain. This tree is recommended for removal.

Tree thirteen (13) is a juvenile Norfolk Island Pine, the tree has been allocated a medium retention value due to its potential lifespan, however, the tree is too close to the existing building to enable it to reach its full potential, as the tree could be readily replaced within the landscape it should not be considered as constraint to development. This tree is recommended for removal.

Tree eighteen (18) is a small Mulberry tree which is of low retention value and should be considered for removal.

Tree twenty-one (21) is a Sandpaper Fig which is of good health and is unaffected by the construction, however, given the context of the development, it seems impractical to attempt to retain this tree when the whole area would benefit much more from an entirely new landscape.

Tree twenty-two (22) is a suppressed Bangalay which has poor form and is not suitable for long-term retention.

Tree twenty-six (26) may be impacted upon by vehicular access requirements, the location of this tree in relation to the overall development is unsustainable.

Tree twenty-seven (27) is a poorly formed specimen of Chinese Elm, the tree is a council street tree which is of very poor form with poor previous pruning.

Tree twenty-eight (28) is a Wallangarra White Gum street tree which is showing signs of decline and has a short remaining lifespan, this tree is unsuitable for long-term retention.

Tree twenty-nine (29) is a Brushbox street tree which is displaying poor form, the tree has a significant lean which appears to have straightened suggesting that the tree may have suffered a partial rootplate failure. The tree is unaffected by the development but it is of very low visual amenity and should be considered for removal.

Tree thirty (30) is a River She-Oak located at the south-east corner of the site, outside the development area and no impacts are anticipated. This tree is displaying good health and good structure and is suitable for long-term retention.

Whilst it may be possible to retain seventeen (17) trees on site, there are only eight (8) trees which warrant significant attempts to retain (1-2-3-4-5-6-11& 30).

Trees proposed for retention (based on concept plan)

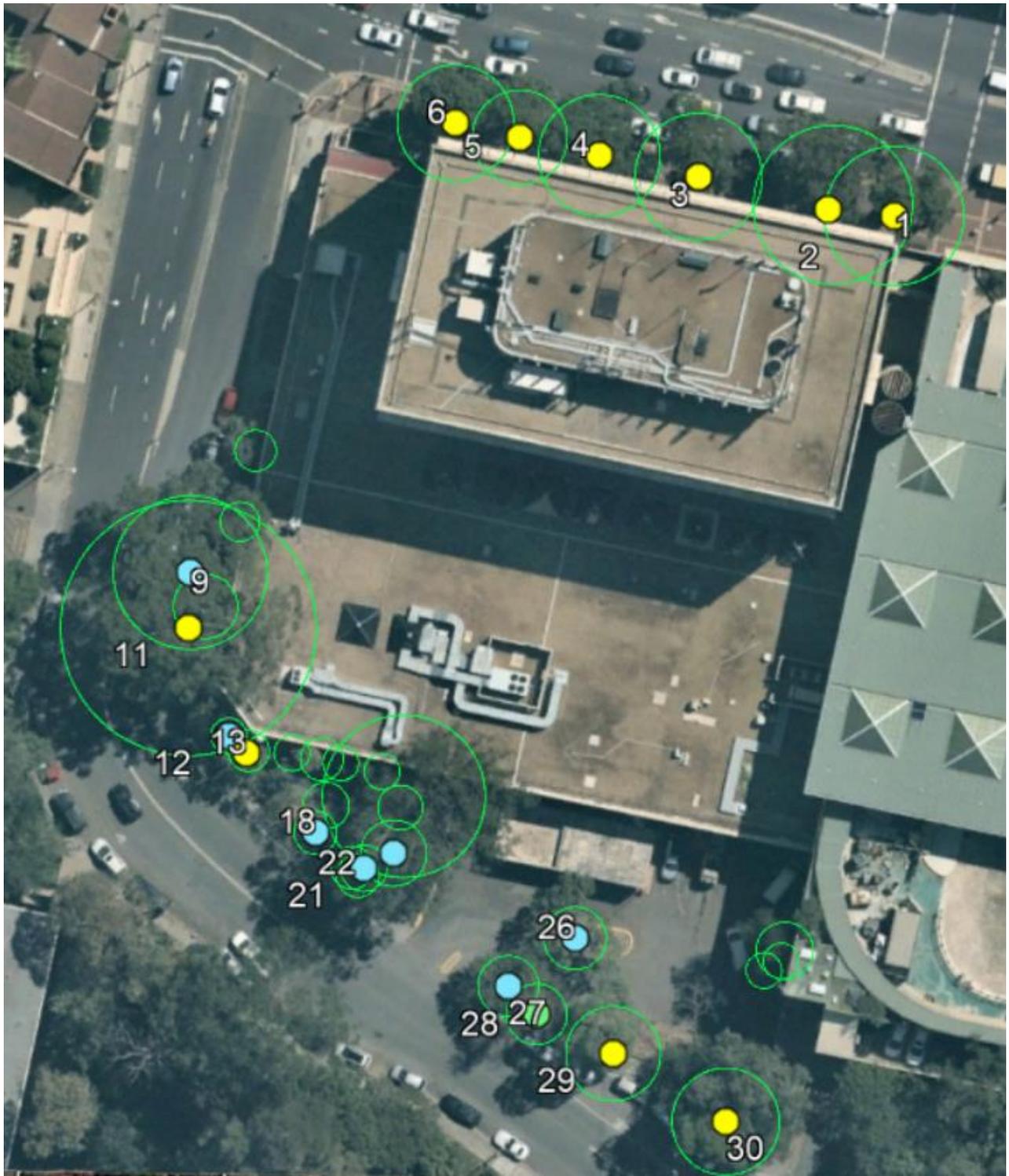


Figure 4- Trees proposed for retention are shown numbered in the drawing above. Empty green circles represent removed trees.

## 9.1 Trees proposed for removal (based on concept plan)

Tree seven (7) is juvenile Black Tea tree which is growing against the existing building and is unable to reach mature dimensions. This tree is proposed for removal.

Tree eight (8) is semi-mature White Bottle brush which is growing against the existing building and is unable to reach mature dimensions. This tree is proposed for removal.

Tree ten (10) is semi-mature Chinese Hackberry which is an environmental weed. This tree is proposed for removal.

Tree fourteen (14) is a juvenile Jacaranda which is growing against the existing building and is unable to reach mature dimensions. This tree is proposed for removal.

Tree fifteen (15) is semi-mature Acacia which has died and is exempt from the DCP. This tree is proposed for removal.

Tree sixteen (16) is semi-mature China Doll which is growing against the existing building and is unable to reach mature dimensions. This tree is proposed for removal.

Tree seventeen (17) is semi-mature Acacia which is almost dead and has partially failed at ground level. This tree is proposed for removal.

Tree nineteen (19) is a suppressed Bangalay which has poor form and is not suitable for long-term retention. This tree is proposed for removal.

Tree twenty (20) is semi-mature Swamp She-Oak which is poorly located and unsuitable for long-term retention. This tree is proposed for removal.

Tree twenty-three (23) is semi-mature Chinese Hackberry which is an environmental weed. This tree is proposed for removal.

Tree twenty-four (24) is a large mature Bangalay which has poor form, the tree is showing symptoms of decline and has large diameter surface roots in contact with the existing building. This tree is not suitable for long-term retention. This tree is proposed for removal.

Tree twenty-five (25) is semi-mature Chinese Hackberry which is an environmental weed. This tree is proposed for removal.

Tree thirty-one (31) is semi-mature Swamp She-Oak which is poorly located in a raised planter bed against the adjacent building and unsuitable for long-term retention. This tree is proposed for removal.

Tree thirty-two (32) is semi-mature Swamp She-Oak which is poorly located in a raised planter bed against the adjacent building and unsuitable for long-term retention. This tree is proposed for removal.

Tree thirty-three (33) is semi-mature Swamp She-Oak which is poorly located in a raised planter bed against the adjacent building and unsuitable for long-term retention. This tree is proposed for removal.

## 9.2 Trees recommended for retention (following assessment)

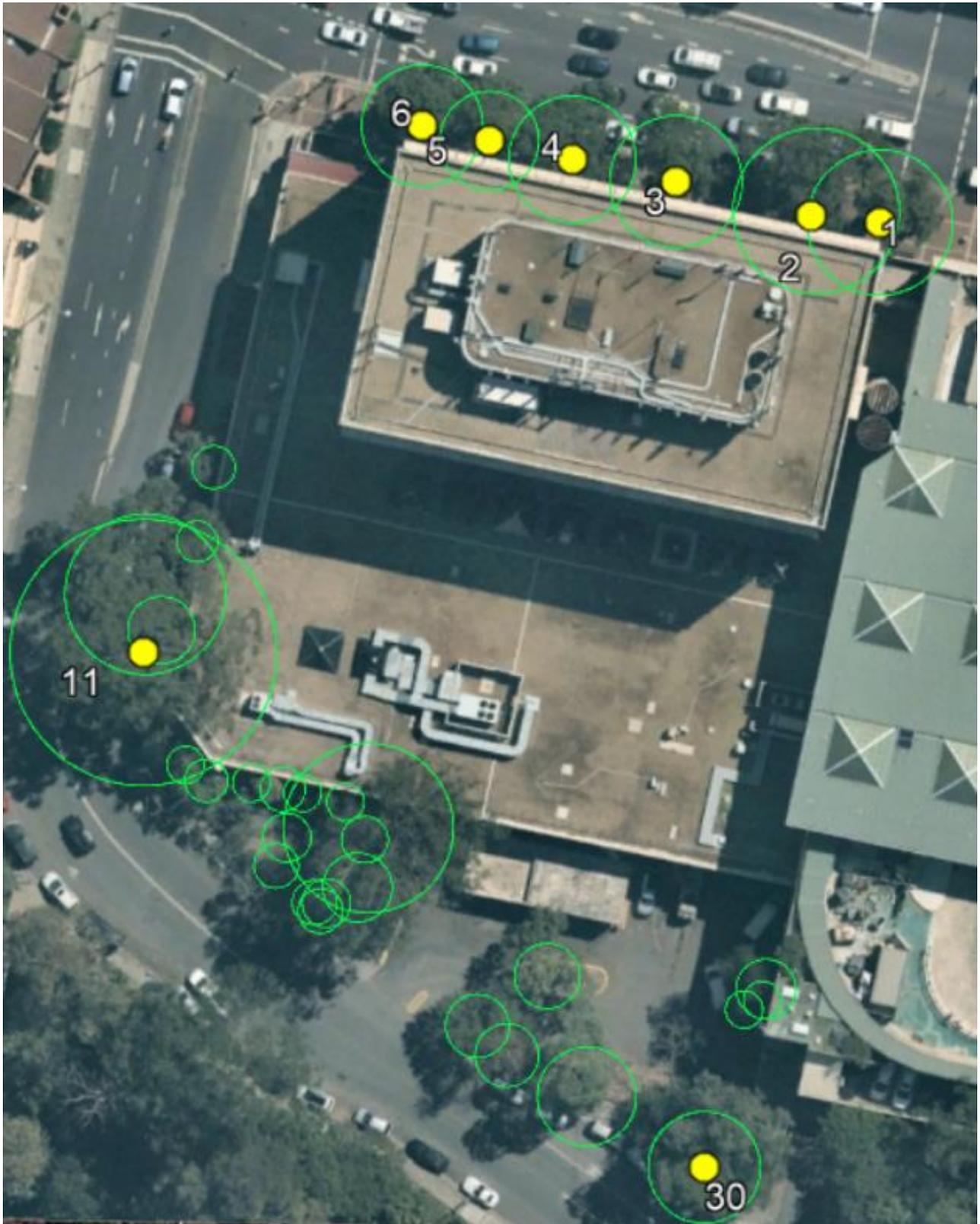


Figure 5- Trees recommended for retention are numbered in the plan above, empty green circles represent removed trees.

## 10 Conclusions

- A total of thirty-three (33) trees were assessed in relation to the proposed development.
- The trees were assessed using elements of the Visual Tree Assessment technique (VTA).
- The trees had retention values allocated in accordance with the Significance of a Tree Assessment Rating System (STARS).
- Tree Protection Zones (TPZ) and Structural Root Zones (SRZ) were calculated in accordance with AS4970-2009- The Protection of Trees on Development Sites.
- No trees were allocated a high retention value using the STARS system, however, trees 1-6 along New South Head Road are clearly the most significant trees on site.
- A total of twelve (12) trees were allocated a medium retention value ( 1-2-3-4-5-6-11-13-14-16-29-30), although trees 13-14 & 16 achieved this rating purely due to having long remaining lifespans as opposed to any landscape significance.
- The concept proposal would enable the retention of seventeen (17) trees including ten (10) trees of medium retention value, six (6) of low retention value and one (1) of very low retention value.
- Whilst it may be possible to retain seventeen (17) trees, it is my opinion that only eight (8) trees are worthy of retention. The proposed development would achieve a far better outcome with removal of the additional trees, especially with regards to the future character of the site with many of the existing trees being poorly formed remnants of a poorly maintained landscape.
- Following close inspection, further assessment and consideration of the desired future character of the site, it was determined that there were only eight (8) trees which warranted significant efforts to retain. The remaining trees could all be easily and reliably replaced within a refreshed landscape setting that such a development will require.

## 11 Recommendations

- Once designs have been progressed, a further Arboricultural Impact Assessment will be required to ensure that the trees proposed for retention remain viable in the context of the development.
- A detailed site-specific tree protection plan and Arboricultural Method statement will be required to specify how the trees for retention will be protected and maintained throughout all stages of demolition and construction.
- Trees 1-2-3-4-5 & 6 are of great importance to the site, the Arboricultural Method Statement must specify how the effects of increased wind loading are to be managed once the existing building is demolished. This is likely to require input from the contractors completing the demolition and construction.
- The proposed development should retain trees 1-2-3-4-5-6-11 & 30.

## 12 References

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APPENDICES

Appendix 1 Visual Tree Assessment (VTA)

The VTA system is based on the theory of tree biology and physiology, as well as tree architecture and structure. This method is used by arborists to identify visible signs on trees that indicate good health, or potential problems. Symptoms of decay, growth patterns and defects are identified and assessed as to their potential to cause whole-tree, part-tree and/or branch failure. This system is based around methods discussed in 'The Body Language of Trees'<sup>1</sup>.

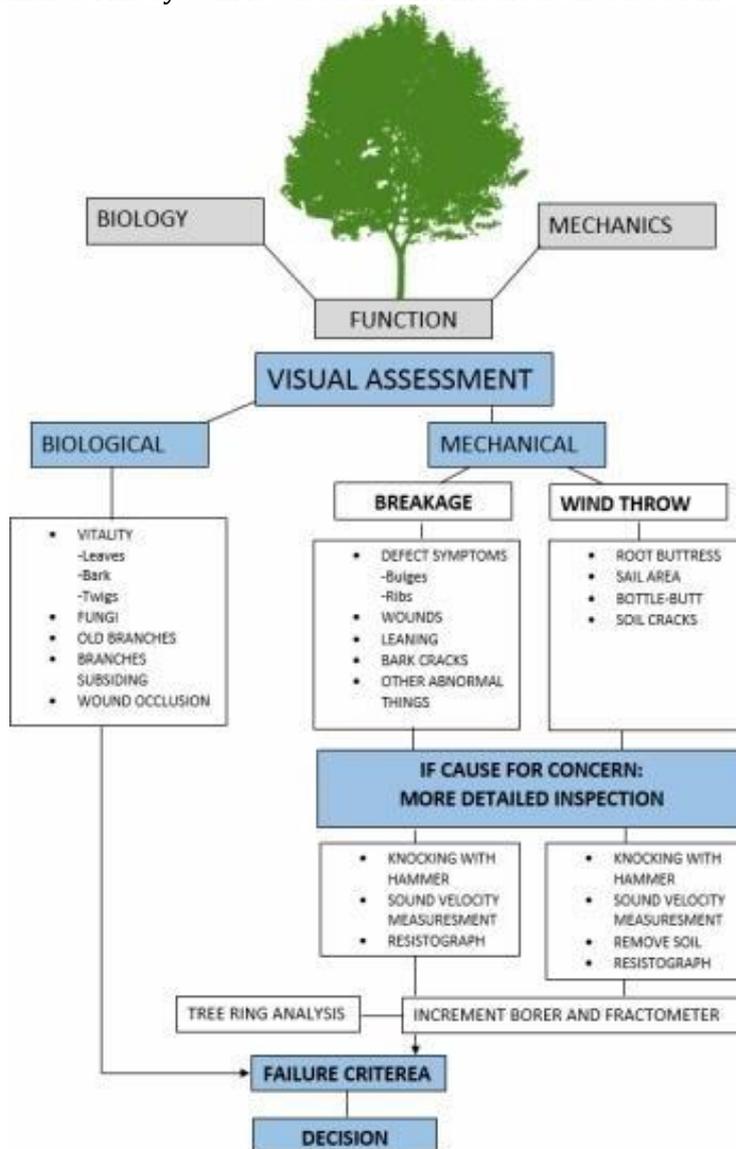


FIGURE 9- REPRESENTATION OF THE VTA SYSTEM.

For the purpose of this report, elements of the VTA system will be used, along with industry standard literature, and other relevant studies that provide an insight into potential hazards in trees. This assessment is a snapshot of what could be reasonably seen or determined from a basic visual inspection. The VTA system is generally used as a means to identify hazardous trees; however, it is important to realize that for a tree to be hazardous there must be a target; a hazard poses no risk if there is no exposure to the hazard.

<sup>1</sup> Mattheck, C. & Breloer, H. 1994. *The Body Language of Trees*.

## Health and vigour assessment

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The health and vigour of a tree is assessed by looking at the tree canopy and how it is performing. Certain indicators provide information on which to base the assessment. Abnormally small leaves, chlorosis (yellowing), sparse crown, wilting, and die-back can be signs of ill-health or decline but may also be related to a temporary imbalance due to drought or pest infestations. Epicormic growth can be a sign of stress and low energy reserves but can also be related to increased light levels through the removal or pruning of adjacent trees. Extension growth can be a good indicator of vigour, but this can vary greatly between species and under differing climatic conditions. For these reasons, each individual symptom or observation needs to be assessed with objectivity and consideration of all available information.

## Structural assessment

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The structural assessment of trees is carried out using the basic framework of Visual Tree Assessment. Signs and symptoms of defects are assessed to gauge the likelihood of failure, because not every defect constitutes a hazard e.g. *“...co-dominant stems are a structural defect. The severity of the defect is increased by included bark, large crowns and strong wind.”*<sup>2</sup> If trees were removed purely on the basis that there were defects present without assessing the likelihood of failure or whether practical mitigation measures are available, the urban forest would cease to exist. A basic visual tree assessment is undertaken from ground level, if defects are suspected further investigation may be required and recommended. *“[When using] the Visual Tree Assessment (VTA) procedure for assessing trees, as the suspicion increases that defects are present, the examination becomes more thorough and searching.”*

*“Some defects, especially some forms of decay, do not give rise to external signs and therefore tend to escape detection in a purely visual survey. If there is no reason for suspecting a hidden defect to occur within a particular part of the tree, there is no reasonable basis for carrying out a detailed internal assessment. Although in theory an unsuspected defect might be detectable by the use of specialized diagnostic devices, this would be impracticable in the absence of some external sign to indicate the place which should be probed. Also, internal examination without good reason is undesirable, as it usually causes injury to the tree and is unreasonably time consuming and costly.”*<sup>3</sup>

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<sup>2</sup> Matheny, N. & Clark, J. 1994. *A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas.*

<sup>3</sup> Lonsdale. 1999. *Principles of Tree Hazard Assessment and Management.*

## Appendix 2 Tree Protection Zone (TPZ) & Structural Root Zone (SRZ) calculations

In accordance with Australian Standard *AS4970-2009 Protection of trees on development sites*<sup>4</sup>, Tree Protection Zone (TPZ) radius is calculated using the following procedure. Diameter of the trunk is measured at approximately 1.4m above ground level; this measurement is referred to as DBH (Diameter at Breast Height).  $R_{TPZ} = DBH \times 12$ . For multi-stemmed trees the formula used is  $R_{TPZ} = \sqrt{[(DBH1)^2 + (DBH2)^2 + (DBH3)^2]}$ . The TPZ is measured radially from the centre of the stem and must be protected on all sides.

The Structural Root Zone (SRZ) radius is calculated by measuring the diameter of the stem close to ground level, just above the basal flare. This measurement is taken as  $D$  and then used in the following formula:  $R_{SRZ} = (D \times 50)^{0.42} \times 0.64$  and becomes the Structural Root Zone, measured radially from the centre of the stem.

It is important to realize that these calculations provide a notional figure only and tree dynamics, form and site conditions will greatly affect these zones, and it is the job of the arborist to interpret the information correctly.

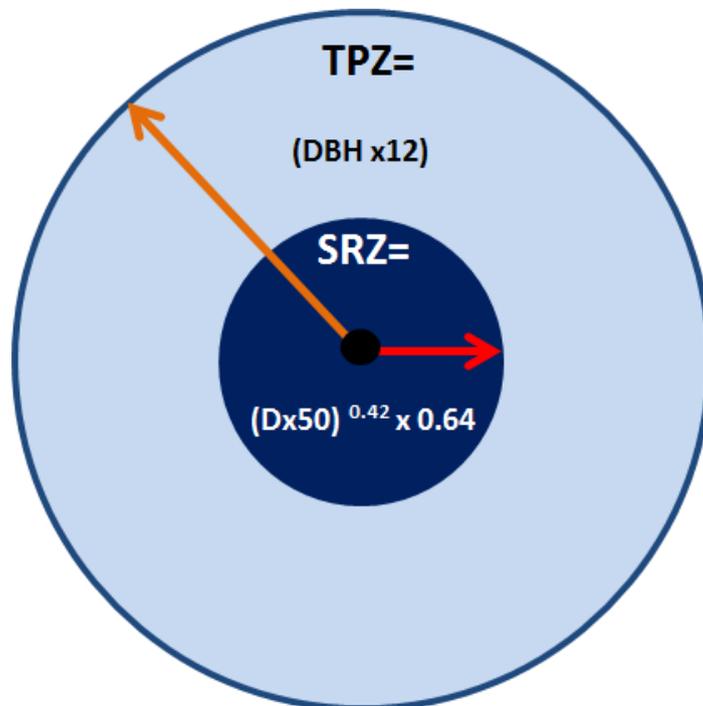


FIGURE 10: A REPRESENTATION OF THE CALCULATIONS REGARDING TREE PROTECTION ZONES (TPZ) AND STRUCTURAL ROOT ZONES (SRZ).

For palms, cycads, tree ferns, and similar monocots, the TPZ is positioned at least 1m outside the crown projection. SRZs are not applicable to these plant types.

*AS4970-2009* states "a TPZ should not be less than 2m nor greater than 15m (except where crown protection is required)" and the minimum radius for an SRZ is 1.5m.

<sup>4</sup> Standards Australia. 2009. *AS4970-2009 Protection of trees on development sites*.

## Appendix 3 Significance of a Tree Assessment Rating System (stars)

### 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. An example of its use in an Arboricultural report is shown as Appendix A.

#### Tree Significance - Assessment Criteria



##### 1. 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 Councils 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.

##### 2. Medium Significance in landscape

- The tree is in fair-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*.

##### 3. Low Significance in landscape

- The tree is in fair-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/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 monocultural stand in its entirety e.g. hedge.

## Tree Retention Value- Priority Matrix.

		Significance				
		1. High	2. Medium	3. Low		
		Significance in Landscape	Significance in Landscape	Significance in Landscape	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					

Legend for Matrix Assessment

	<b>Priority for Retention (High)</b> - 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 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.
	<b>Consider for Retention (Medium)</b> - 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.
	<b>Consider for Removal (Low)</b> - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
	<b>Priority for Removal</b> - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

### USE OF THIS DOCUMENT AND REFERENCING

The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows:

IACA, 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, [www.iaca.org.au](http://www.iaca.org.au)

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## Disclaimer

The information contained within this report is to be used solely for the purposes that were specified at the time of engagement.

All attempts have been made to ensure the legitimacy of any information which has been gathered in the process of compiling this report, however Truth About Trees. cannot be held liable for inaccurate or misleading information which has been provided by others.

Any tree inspections or assessments which have been carried out for the purposes of this report are valid only at the time of inspection and are based on what could reasonably be seen or diagnosed from a visual inspection carried out from ground level.

All inspections, unless otherwise stated, are based upon Visual Tree Assessment (VTA) techniques, industry best practice and applied knowledge. No internal diagnostic testing or below ground investigation has been carried out, unless otherwise stated.

Trees are a dynamic living organism and as such they have a finite lifespan the end of which cannot always be predicted or understood, even apparently healthy trees can die suddenly or fall without warning. As such there is no warranty or guarantee provided, or implied, regarding the future risks associated with any tree.

Please feel free to contact me either via telephone or email if you have any questions regarding this report.

Kind regards

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