

Arboricultural Impact Assessment



Prepared For

CPB Dragados Samsung Joint Venture (CDS-JV)
30 Garema Ct
Kingsgrove NSW 2208
M5N-ES-RPT-ARN-0014

Tempe Reserve Grouting Site Compound
TEMPE NSW 2044

Prepared by [REDACTED]

Consulting Arboriculturist & Horticulturist

Tree Surgery Certificate

Advanced Certificate Urban Horticulture

Diploma of Horticulture (Arboriculture)

Member of the International Society of Arboriculture (ISA)

ISA Tree Risk Assessment Qualification (TRAQ)

[REDACTED]

Revision 2

JUNE 2017

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Introduction

1.1 Brief

This Arboricultural Impact Assessment (AIA) was prepared by Treeism Arboricultural Services and was commissioned by CPB Dragados Samsung Joint Venture (CDB-JV).

“The site” is described as the Tempe Reserve Grouting Site Compound, Tempe, New South Wales.

The subject site is outside Road and Maritime Service owned land. The subject site location is as below Figure 1.

The proposed works are part of the larger WestConnex New M5 project. Scope of works specifically for the subject area is:

- drilling activities in relation to grouting;
- safe vehicle entry, standing for works and exit;
- laying of water and grout lines over vegetation between grouting station and disturbance area to allow drilling and grouting activities.

This report gives recommendations for tree retention or removal, and provides guidelines for tree protection and maintenance.

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible; however, I can neither guarantee nor be responsible for the accuracy of information provided by others.

This report is not intended to be a comprehensive tree risk assessment; however, the report may make recommendations, where appropriate, for further assessment, treatment or testing of trees where potential structural problems have been identified, or where below ground investigation may be required.

This AIA is not intended as an assessment of any impacts on trees by any proposed future development of the site, other than the current discussed scope of work.

The purpose of this report is to assess the vigour and condition of the trees, and identify the potential impacts the proposed development may have on those trees to be retained in proximity to the works.

The author of this report holds an AQF Level 5 Diploma of Horticulture (Arboriculture) and has 23 years in the horticultural industry.

18 of these 23 years have been specifically within the field of arboriculture with roles varying from tree climber within private contracting companies, Council Tree Management Officer at several local Councils and working with independent consultants, prior to the start up of Treeism. The author is independent from the project.

This AIA has been commissioned to ensure compliance with the requirements set out by the Department of Planning and Environment (DPE) as per Condition B63 - Table 1 (below/next page).

| Condition | Requirement | Addressed in: |
|-----------|---|---|
| B63 | The SSI must be designed to retain as many trees as possible and provide a net increase in the number of replacement trees. The Proponent must commission an independent experienced and suitably qualified arborist, to prepare a comprehensive Tree Report(s) prior to removing any trees on the periphery and/or outside the construction footprint as identified in the figures in Section 6 of the document referred to in condition A2(b), including any tree(s) removed along Euston Road. The Tree Report may be prepared for the entire SSI or separate reports may be prepared for individual areas where trees are required to be removed. The report(s) must identify the impacts of the SSI on trees and vegetation within and adjacent to the construction footprint. The report(s) must include: | This Report – But N/A as no vegetation classed as a tree proposed for removal. |
| B63(a) | a visual tree assessment with inputs from the design, landscape architect, construction team; | N/A- no vegetation classed as a tree proposed for removal. No input from a landscape architect was included as these are temporary works only and will be rehabilitated in accordance with the landowners requirements. |
| B63(b) | consideration of all options to amend the SSI where a tree has been identified for removal, including realignment, relocation of services, redesign of or relocation of ancillary components (such as substations, fencing etc.) and reduction of standard offsets to underground services. | N/A- no vegetation classed as a tree proposed for removal. |
| B63(c) | Measures to avoid the removal of trees or minimise damage to existing trees and is to ensure the health and stability of those trees to be protected. This includes details of any proposed canopy or root pruning, excavation works, site controls on waste disposal, vehicular access, and storage of materials and protection of public utilities. | Section 2 Part 2.4-2.5 & Section 4 and 5. |
| | In the event that trees are to be removed, then replacement trees are to be planted within, or in close proximity to, the SSI boundary, including along Euston Road where feasible and reasonable The location of the trees must be determined in consultation with the relevant council(s). The replacement trees are to have a minimum pot size of 75 litres. A copy of the report(s) must be submitted to the Secretary for approval prior to the removal, damage and/or pruning of any trees, including those affected by site establishment works. All recommendations of the report must be implemented by the Proponent, unless otherwise agreed by the Secretary. | N/A- no vegetation classed as a tree proposed for removal. |

Table 1 –Condition of Approval B63 Compliance Table



Figure 1 – Red denotes discussed site access area impacting vegetation. Grey area denotes temporary construction zone. Aerial Map courtesy of Google Mapping 2017.

1.2 Methodology

In preparation for this report, ground-level, visual tree assessments (VTA), or limited VTA (e.g. where access was limited), were completed by the author of this report on 15th May 2017. Inspection details of these trees are provided in Appendix E —Schedule of Assessed Trees.

The tree heights were visually estimated or measured using a Nikon ForestryPro Laser measurer. Unless otherwise noted in Appendix E, the trunk Diameter at Breast Height were measured at 1.4 metres above ground level (DBH) using a diameter tape. Tree canopy spreads were stepped out with field observations written down, and photographs of the site and trees were taken using an iphone 6.

No aerial inspections, root mapping or woody tissue testing were undertaken as part of this tree assessment. Information contained in this report only reflects the condition of the trees at the time of inspection. Trees are dynamic, living things which can be subject to change without notice in certain circumstances.

An onsite meeting was attended by the author of this report [REDACTED] (CDS-JV Construction Team, Environment Manager, West), [REDACTED] (CDS-JV Environment Advisor) and [REDACTED] (CDS-JV Senior Project Engineer) on the 15th May 2017.

Plans and documents referenced for the preparation of this report include:

- AS4970-2009 Protection of trees on development sites, Standards Australia;
- Conditions B63 –(Table 1);
- Figure 2: Tempe Reserve Grouting Site Compound Layout – no document number, or date (see Appendix F);
- AS4373-2007 Pruning of Amenity Trees, Standards Australia.

1.3 Tree Preservation and Management Guidelines

The proposed works form part of the approved WestConnex New M5 State Significant Infrastructure Project (SSI 6788). Clause 5.9 of the Marrickville Local Environment Plan 2011 (MLEP), therefore does not apply.

What constitutes a ‘tree’ as per planning approval is any tree that:

- is equal to or greater than three metres in height; or
- for a single trunk species, a trunk circumference of 300 millimetres at a height of one metre above ground level; or
- for a multi-trunk species, a trunk circumference exceeding 100 millimetres at a height of one metre above ground level.

However this excludes any species listed under the Noxious Weeds Act 1993.

Observations and Discussion

2.1 Summary of Assessed Trees

Ten (10) trees/tree groups were assessed and included in this report. Details of these are included in the Schedule of Assessed Trees – Appendix E, the tree location plan is as below. Of these trees:

- eight (8) trees are prescribed (i.e. considered a ‘tree’ under the planning approval) trees– Trees 2-4, 5-9; and
- two (2) are non-prescribed trees/tree groups (i.e. exempt from authority approval to remove or prune due to being noxious weed species), - Group 1 and Tree 4A

Of the eight (8) prescribed trees the following Retention Value (RV- see Appendix C) was ascribed to each:

- two (2) trees have Low RVs – Tree 6 & 7
- five (5) trees have Medium RVs –Trees 2, 3, 4, 8 and 9;
- one (1) tree has a High RVs – Tree 5.

The subject trees/tree groups are shown as red dot markings/boxed in Figure 2 below/next page and also as Appendix D.



Figure 2 – Marked up Aerial Photography. Tree locations noted with red, all prescribed trees are proposed for retention.

2.2 Threatened Species

No assessed prescribed tree is classed as Vulnerable or Endangered under the NSW Threatened Species Conservation Act 1995 or the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

2.3 Proposed Removal of Trees

Non-prescribed -

Several small shrubs will require removal within Group 1 on the very edge of the pathway. Most of these specimens could easily be dug up by hand and covered with wet hessian and replanted after works have been completed. These removals will have minimal impact on the overall garden bed aesthetic.

One (1) *Melaleuca nodosa* – Prickly Paperbark (T4A) will also require removal to allow vehicular access along pathway.

Prescribed trees –

No prescribed tree requires removal.

2.4 Proposed Tree Retention

The following trees are proposed/recommended to be retained:

- Tree 2 – *Angophora costata* (Sydney Red Gum);
- Tree 3 - *Angophora costata* (Sydney Red Gum);
- Tree 4 - *Angophora costata* (Sydney Red Gum);
- Tree 5 - *Casuarina cunninghamiana* (River She-oak);
- Tree 6 – *Melaleuca citrina* (Crimson Bottlebrush);

- Tree 7 *Casuarina glauca* (Swamp She-oak);
- Tree 8 *Casuarina glauca* (Swamp She-oak);
- Tree 9 *Casuarina* sp. (She-oak).

2.5 Potential Impacts on Trees Proposed for Retention

No excavation works are taking place within the defined TPZ or SRZ of any prescribed tree. In fact, outside the proposed drilling holes no excavation is occurring at all.

Vehicles will be keeping to the defined pathways where possible, only minimal encroachment may occur on edge of garden beds where paths are narrow.

Temporary fencing will be placed and given decent spacing between plants, in the proposed locations, this can avoid damage to vegetation foliage and roots. Fence post location will need to be flexible.

Group 1 - Various shrubs under 2m in height – for full details see Appendix E.

Several shrubs just along the edge of the existing pathway will require removal. These shrubs are currently located hard against the edge of the garden bed and the existing pathway. The remaining area of garden bed will be minimally impacted.

Hoses will need to be placed over some vegetation to allow clean water, waste water and grout movement to and from the Grouting Station to the works site. These hoses will be placed and left in position and not constantly moved thus minimal disturbance will occur. It is expected some minor twiggy branch breakage may occur but this will not impact overall long term health or condition of these shrubs. There are no prescribed trees within the proposed location of hose placement.

Tree 2 – 4 – Sydney Red Gum.

The tree stems is set well back from the pathway within the garden bed and will not be affected from the proposed vehicle access. Very minor pruning of low branches is required to allow vehicular access without damage to the tree.

Tree 5 – River She-oak.

The tree stem is set well back from the pathway within the defined garden bed and will not be affected from the proposed vehicle access. Minor pruning of low branches is required to allow vehicular access without damage to the tree or vehicle.

Tree 6 – Crimson Bottlebrush.

This likely self-sown specimen is located right on the edge of the path and a sharp slope. It is multi-stemmed at ground level. Only a small proportion of the stems will require pruning to allow vehicular access.

Tree 7 – Swamp She-Oak

This tree has most likely self sown and is located right on the edge of the pathway and garden bed. The stem is set back enough from the pathway and will not be affected from the proposed vehicle access. Minor pruning of branches is required to allow vehicular access without damage to the tree.

Tree 8 & 9 – Swamp She-oak

These two (2) trees are located at the gate access. The stems are set behind the metal bollards and should not be impacted upon. Low hanging branches will require pruning to ensure no tearing of the said branches and no vehicular damage.

Recommendations

3.1 Vegetation Removal

Several shrubs within Group 1 and one (1) isolated shrub (T4A –see Appendix E for details) is to be removed to allow access along the pathway.

These shrubs are *non-prescribed* under the DPE description. Replanting will be undertaken in accordance with the condition B63 of the Compliance Table.

Tree removal work shall be carried out by minimally qualified AQF Level 2 Arborist in compliance with the NSW Workcover Code of Practice for the Amenity Tree Industry, these contractors shall be advised of trees in close proximity being retained and instructed to avoid damage to such.

The stumps should be retained and not poisoned in this instance.

Placement of the temporary fence shall be sympathetic to vegetation and post location flexible to avoid root or foliage damage.

No *prescribed* tree requires removal.

Tree Protection Measures

4.1 Pruning Work & Minimising Impacts on Trees to be Retained

Group 1 – Various shrubs

- Limit movement of hoses over vegetation, place in position and then leave in position as much as practical.
- Avoid access into garden bed area as much as feasible.
- Hand dig (non-powered equipment) to remove small vegetation along edge of pathway as required.

Tree 2 – Sydney Red Gum.

- Vehicle to remain within defined concrete pathway and must avoid entering garden bed where possible.
- Pruning required as per Clause 7.3.2 of AS 4373-2007 '*Pruning of Amenity Trees*' Australian Standard. Reduction prune by removing branches to internal lateral branches or stems.
- Prune one (1) 80mm diameter low limb over pathway and remaining branches to be a maximum 40mm diameter.
- A maximum 10% of the total live canopy is to be removed.

Tree 3 – Sydney Red Gum.

- Vehicle to remain within defined concrete pathway and must avoid entering garden bed.
- Pruning required as per Clause 7.3.2 of AS 4373-2007 '*Pruning of Amenity Trees*' Australian Standard. Reduction prune by removing branches to internal lateral branches or stems.
- Prune one (1) 60 - 80mm diameter low limb over pathway
- A maximum 5% of the total live canopy is to be removed.

Tree 4 – Sydney Red Gum.

- Vehicle to remain within defined concrete pathway and must avoid entering garden bed.
- Pruning required as per Clause 7.3.2 of AS 4373-2007 '*Pruning of Amenity Trees*' Australian Standard. Reduction prune by removing branches to internal lateral branches or stems.
- Minor 40mm diameter branches and a maximum 5% of the total live canopy to be removed.

Tree 5 – River She- Oak.

- Vehicle to remain within defined concrete pathway and must avoid entering garden bed.
- Pruning required as per Clause 7.3.2 of AS 4373-2007 '*Pruning of Amenity Trees*' Australian Standard. Reduction prune by removing branches to internal lateral branches or stems.
- Five (5) to six (6) branches, with a maximum 100mm diameter and 10% of the total live canopy are to be removed.

Tree 6 – Crimson Bottlebrush.

- Pruning required as per Clause 7.2.4 of AS 4373-2007 '*Pruning of Amenity Trees*' Australian Standard. Selectively prune two (2) stems to the east (over the pathway) to clear access.
- Vehicle to remain within defined concrete pathway.

Tree 7 – Swamp She-Oak.

- Vehicle to remain within defined concrete pathway and must avoid entering garden bed.
- Pruning required as per Clause 7.3.2 of AS 4373-2007 '*Pruning of Amenity Trees*' Australian Standard. Reduction prune by removing branches to internal lateral branches or stems.
- A maximum 40mm branch diameter is to be removed.
- A maximum 5% of the total live canopy is to be removed.

Tree 8 – Swamp She-Oak.

- Vehicle to remain within defined concrete pathway.
- Pruning required as per Clause 7.3.2 of AS 4373-2007 '*Pruning of Amenity Trees*' Australian Standard. Reduction prune by removing branches to internal lateral branches or stems.
- A maximum 80mm branch diameter is to be removed.
- A maximum 10% of the total live canopy is to be removed.

Tree 9 – Swamp She-Oak.

- Vehicle to remain within defined concrete pathway.
- Pruning required as per Clause 7.3.2 of AS 4373-2007 ‘*Pruning of Amenity Trees*’ Australian Standard. Reduction prune by removing branches to internal lateral branches or stems.
- A maximum 100mm branch diameter is to be removed.
- A maximum 10% of the total live canopy is to be removed.

4.2 Stockpiling and Location of Site Sheds

- Any ground identified for proposed stockpiling that is within the TPZ of trees to be retained shall be covered with thick, coarse mulch, placement of wooden pallets over the mulch, covering of the pallets with a tarpaulin (or similar), and the placement of materials on top of this device to prevent loose or potentially contaminating materials from moving into the soil profile.

4.3 Hygiene Practices

- No washing or rinsing of tools or other equipment, preparation of any mortars, cement mixing, or brick cutting is to occur within 8m up slope of any palms/trees to be retained.

References

Credit to [REDACTED] of ‘Urban Forestry Australia’ for general report layout and several areas of text.

Mattheck, C. & Breloer, H. (1994) *The Body Language of Trees: A handbook for failure analysis. Research for Amenity Trees No. 4*, The Stationery Office, London.

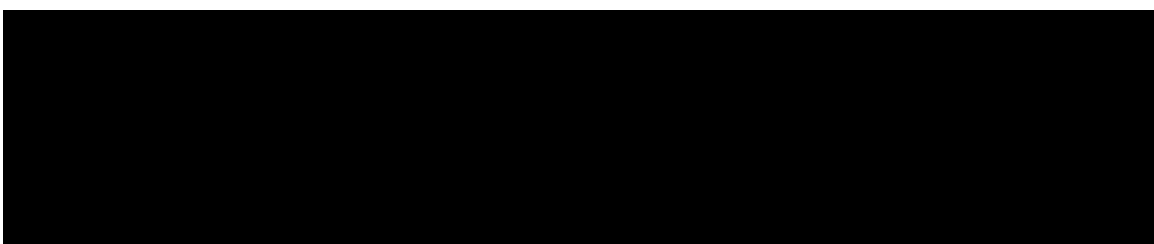
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Hadlington, P. & Johnston, J. (1988) *Australian Trees: Their Care & Repair*. University of NSW Press, Kensington.

Standards Australia AS4970-2009 *Protection of trees on development sites*, Standards Australia, Sydney.

Barrell, J (1995) *Pre-development Tree Assessment from Trees and Building Sites*, Eds. Watson & Neely, International Society of Arboriculture, Illinois.

Report prepared by [REDACTED] – June, 2017



5.1 Appendix A - Terms and Definitions

Age classes

- Y** Young refers to an established but juvenile tree.
- SM** Semi-mature refers to a tree at growth stages between immaturity and full size.
- EM** Early-mature refers to a tree close to full sized still actively growing.
- M** Mature refers to a full sized tree with some capacity for further growth.
- LM** Late-Mature refers to a full sized tree with little capacity for growth that is not yet about to enter decline.
- OM** Over-Mature refers to a full sized tree with little capacity for growth that is entering or has entered decline.

Co-dominant: refers to stems or branches equal in size and relative importance.

Condition/Structure: refers to the tree's form and growth habit, as modified by its environment (aspect, suppression by other trees, soils) and the state of the scaffold (i.e. trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition/structure.

Deadwood: refers to any whole limb that no longer contains living tissues (e.g. live leaves and/or bark). Some dead wood is common in a number of tree species.

Diameter at Breast Height (DBH): Refers to the tree trunk diameter at breast height (1.4 metres above ground level).

Epicormic growth: adventitious branches that are considered to be a weak attachment in the short term due to minimal wood formation. There are generally formed following storm-related branch breakage or poor pruning practices. Should sufficient holding wood form in the long-term this growth is less of an issue.

Health: Refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion, and the degree of dieback.

Inclusion stem/bark: the pattern of development at branch or stem junctions where bark is turned inward rather than pushed out. This fault is located at the point where the stems/branches meet. This is normally a genetic fault and potentially a weak point of attachment as the bark obstructs healthy tissue from joining together to strengthen the joint.

Secondary Stem: refers to stems or branches with one of unequal size and relative importance.

SRZ: refers to the Structural Root Zone of the tree, this is the area required for tree stability.

TPZ: refers to the Tree Protection Zone of the tree, this is the primary method of protecting trees, it is a combination of the root area and the canopy and the SRZ is located within it.

Visual Tree Assessment (VTA): a procedure of defect analysis developed by Mattheck and Breloer (1994) that uses the growth response and form of trees to detect defects.

5.2 Appendix B - ULE Guide

ULE categories (after Barrell 1996, Updated 01/04/01)

The five categories and their sub-groups are as follows:

1. Long ULE - tree appeared retainable at the time of assessment for over 40 years with an acceptable degree of risk, assuming reasonable maintenance:
 - a) Structurally sound trees located in positions that can accommodate future growth
 - b) Trees which could be made suitable for long term retention by remedial care
 - c) Trees of special significance which would warrant extraordinary efforts to secure their long term retention
2. Medium ULE - tree appeared to be retainable at the time of assessment for 15 to 40 years with an acceptable degree of risk, assuming reasonable maintenance:
 - a) Trees which may only live from 15 to 40 years
 - b) Trees which may live for more than 40 years but would be removed for safety or nuisance reasons
 - c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
 - d) Trees which could be made suitable for retention in the medium term by remedial care
3. Short ULE - tree appeared to be retainable at the time of assessment for 5 to 15 years with an acceptable degree of risk, assuming reasonable maintenance:
 - a) Trees which may only live from 5 to 15 years
 - b) Trees which may live for more than 15 years but would be removed for safety or nuisance reasons
 - c) Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
 - d) Trees which require substantial remediation and are only suitable for retention in the short term.
4. Removal - trees which should be removed within the next 5 years:
 - a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions
 - b) dangerous trees through instability or recent loss of adjacent trees
 - c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form
 - d) Damaged trees that are clearly not safe to retain
 - e) Trees which may live for more than 5 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting
 - f) Trees which are damaging or may cause damage to existing structures within the next 5 years
 - g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f)
 - h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review
5. Small, young or regularly pruned - Trees that can be reliably moved or replaced:
 - a) small trees less than 5m in height
 - b) young trees less than 15 years old but over 5m in height
 - c) formal hedges and trees intended for regular pruning to artificially control growth

5.3 Appendix C – STARS – Significance of a Tree Assessment Rating System (IACA 2010)©

The landscape significance of a tree is an essential criterion for establishing 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.

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 and *Useful Life Expectancy* of an individual tree has been defined, the retention value can be determined.

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 designed for individual trees only, but can be applied to a monocultural stand in its entirety e.g. hedge.

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 and Andrew Morton in June 2001.


| | | 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 | | | | | |
| <p><u>Legend for Matrix Assessment</u></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 <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.</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> | | | | |

Table 1 - Tree Retention Value - Priority Matrix.

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

5.4 Appendix D – Tree Location Plan



5.5 Appendix E – Schedule of Assessed Trees – Tempe Reserve, Tempe

| Tree No. | Genus & species Common Name | Ht (m) | Sp (m) | DBH (mm) | Age | V | C | Comments | ULE | TSR | RV | SRZ (m) | TPZ (m) |
|-----------|--|--------|--------|---------------------|-----|---|---|---|-----|-----|----|---------|---------|
| G1 | <i>Lomandra sp.</i> <i>Melaleuca sp.</i> <i>Acacia sp.</i> <i>Leptospermum sp.</i> <i>Dianella sp.</i> | 0.3-2 | - | - | - | G | G | Locally indigenous species. Planted garden bed. Not prescribed under DPE conditions. | 5A | M | L | - | - |
| 2 | <i>Angophora costata</i> Sydney Red Gum | 7.2 | 8 | 180/ 180 | EM | G | G | Locally indigenous species. Planted garden bed. Co-dominant @ 0.3m AGL. No special problems noted at time of assessment. Minor pruning will be required to accommodate works. | 1A | M | M | 1.9 | 3.0 |
| 3 | <i>Angophora costata</i> Sydney Red Gum | 8.4 | 10 | 250/ 300/ 100 | M | G | G | Locally indigenous species. Planted garden bed. Co-dominant @ 0.2m AGL. No special problems noted at time of assessment. Secondary stem from base. Minor pruning will be required to accommodate works. | 1A | M | M | 2.3 | 4.8 |
| 4 | <i>Angophora costata</i> Sydney Red Gum | 5.8 | 6 | 100/ 100 | EM | G | G | Locally indigenous species. Planted garden bed. Co-dominant @ 0.3m AGL. No special problems noted at time of assessment. Minor pruning will be required to accommodate works. | 1A | M | M | 1.5 | 2 |
| 4A | <i>Melaleuca nodosa</i> Prickly Leaved Paperbark | 2 | 2 | - | M | G | G | Locally indigenous species. Planted garden bed. Not prescribed under DPE conditions. Located at base of T4 path-side. | 5A | L | L | - | - |
| 5 | <i>Casuarina cunninghamiana</i> River She-oak | 9 | 12 | AB 525 | M | G | G | Locally indigenous species. Planted garden bed. Low sprawling branches. Most branches to the west due to competing vegetation. Minor pruning will be required to accommodate works. | 1A | M | H | 2.6 | 6.4 |

| Tree No. | Genus & species Common Name | Ht (m) | Sp (m) | DBH (mm) | Age | V | C | Comments | ULE | TSR | RV | SRZ (m) | TPZ (m) |
|----------|--|--------|--------|----------|-----|---|-----|---|-----|-----|----|---------|---------|
| 6 | <i>Melaleuca citrina</i> (formerly <i>Callistemon citrinus</i>) Crimson Bottlebrush | 5.2 | 5 | AB 225 | M | G | G | Locally indigenous species. Appears to be self-seeded. Seven stems @ 0.1m AGL. No special problems noted at time of assessment. | 5B | L | L | 1.8 | 2.7 |
| 7 | <i>Casuarina glauca</i> Swamp She-oak | 3.4 | 4 | 125 | Y | G | G | Locally indigenous species. Appears to be self-seeded. No special problems noted at time of assessment. Minor pruning will be required to accommodate works. | 5A | L | L | 1.5 | 2 |
| 8 | <i>Casuarina glauca</i> Swamp She-oak | 11 | 10 | 175/225 | M | G | G-F | Locally indigenous species. Secondary stem @ 1m AGL, included with minor cavity. Rubbing, fused branches noted in upper canopy. Minor pruning will be required to accommodate works. | 2A | M | M | 2.0 | 3.3 |
| 9 | <i>Casuarina glauca</i> Swamp She-oak | 11 | 10 | 300/200 | M | G | G | Locally indigenous species. Secondary stem @ 1m AGL. No special problems noted at time of assessment. Minor pruning will be required to accommodate works. | 2A | M | M | 2.2 | 4.2 |

KEY



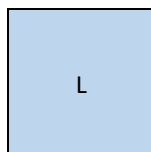
Tree to be retained.



Dead/noxious weed/Less than 3m in height – not classed as ‘a tree’ under DPE conditions.



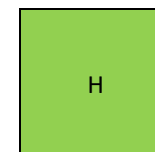
Tree proposed to be removed.



L Low Retention Value-These trees are not considered important for retention.



M Medium Retention Value-These trees may be retained & protected.



H High Retention Value -These trees are considered important for retention and should be retained and protected.

* DBH/Height is visually estimated (usually adjoining trees or those that are hard to access).

AB – above *buttress roots*. AGL - above ground level.

** Determined by the largest number found (i.e. broadest branch spread or highest DBH) within a tree group to ensure ample tree protection zone.

H refers to the approximate height of a tree in metres, from base of stem to top of tree crown.

Sp refers to the approximate and average spread in metres of branches/canopy (the ‘crown’) of a tree.

DBH refers to the approximate diameter of tree stem at breast height i.e. 1.4 metres above ground (unless otherwise noted), and expressed in millimetres.

Age refer to Appendix A -Terms and Definitions for more detail.

V refers to the tree’s vigour (health) Refer to Appendix A -Terms and Definitions for more detail.

C refers to the tree’s structural condition. Refer to Appendix A -Terms and Definitions for more detail.

ULE refers to the estimated *Useful Life Expectancy* of a tree. Refer to Appendices A and B for details.

TSR The *Tree Significance Rating* considers the importance of the tree as a result of its prominence in the landscape and its amenity value, from the point of view of public benefit. Refer to Appendix C – Significance of a Tree Assessment Rating for more detail.

RV Refers to the retention value of a tree, based on the tree’s ULE *and* Tree Significance. Refer to Appendix C – Significance of a Tree Assessment Rating for more detail.

SRZ Structural Root Zone (SRZ) refers to the critical area required to maintain stability of the tree. Refer to Appendix A -Terms and Definitions for more detail.

TPZ Tree Protection Zone (TPZ) refers to the *tree protection zones* for trees to be retained. Refer to Appendix A -Terms and Definitions for more detail.

5.6 Appendix F- Site Compound Layout



5.7 Appendix G - Photographs



Photo 1 – Group 1 – Consists of low non-prescribed vegetation along the edge of the pathway.



Photo 2 – Tree 2 noted with red arrow.



Photo 3 – Tree 4 noted with red arrow.



Photo 4 – Tree 5 noted to left, Tree 4A – non-prescribed shrub noted to right.



Photo 5 – Tree 6



Photo 6 – Tree 7



Photo 7 – Trees 8 & 9 – only low branching over pathway requires pruning.