

# Arboricultural Impact Assessment



## Site Address

Westconnex New M5  
Euston Road  
ALEXANDRIA NSW 2015



**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)

***CDS reference: M5N-ES-RPT-LRW-0046-00***

**Revision 5**

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**FEBRUARY 2019**

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# 1 Introduction

## 1.1 Brief

This Tree Pruning Specification (TPS) was prepared by Treeism Arboricultural Services and was commissioned by [REDACTED] (Senior Environment Adviser) of CPB Contractors, Dragados and Samsung C&T Joint Venture (CDS-JV).

- The proposed works are part of the larger WestConnex New M5 project. The scope of work specifically for the discussed area is to install 10.5m street lighting poles in designated positions along Euston Road, Alexandria.

Care has been taken to obtain all information from reliable sources. Data has not been verified in several areas of this report so I can neither guarantee nor be responsible for the accuracy of information provided by others.

The trees discussed in this report were subject to a previous report written by Australian Tree Consultants (ATC). This report is known as M5N-ES-RPT-LRW-0006-08 Revision 8 and dated 26 May 2018. The designated locations of the lighting poles had not been determined at the time of preparing the previous ATC report. All data utilised from this report can be found within Appendix F – Schedule of Assessed Trees, any differentiation is noted in red.

Minor adjustments have been made however, specifically, the Structural Root Zones (SRZ) have been amended to better reflect the natural stem flare common to most trees given the SRZ calculation is taken above the buttress roots and not at breast height. A 12.5% calculation has been added, whilst this is not as accurate as manually measuring the trees above the root buttress, it should be a better reflection of the true SRZ. AS4970-2009 Protection of Trees on Development Sites states within Section 3.2 Determining the TPZ that a TPZ should not be greater than 15m so the schedule has been adjusted to reflect this.

The purpose of this report is to ensure the retention and protection of the discussed trees to be retained in proximity to the proposed works.

The author of this report holds an AQF Level 5 Diploma of Horticulture (Arboriculture) and has 25 years in the horticultural industry. 20 of these 25 years have been specifically within the field of arboriculture.

Previous roles varied from working actively as a tree climber in private contracting companies to Tree Management Officer at several local Councils and working with independent Consultants. The author is independent from the project.

This TPS 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).

**Table 1** –Condition of Approval B63 Compliance Table

Condition	Requirement	Addressed in:
B63	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:	Previous ATC Report M5N-ES-RPT-LRW-0006-08, 26 May 2018 and this report.

B63 (a)	a visual tree assessment with inputs from the design, landscape architect, construction team;	Previous ATC Report M5N-ES-RPT-LRW-0006-08, 26 May 2018 and Section 1.2 of this report.
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; and	Appendix C – onsite discussion.
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, storage of materials and protection of public utilities.	This report - Section 3.
B63	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.	No tree removal, damage and/or pruning will occur to the subject trees prior to the Secretary's approval of this report.

## 1.2 Methodology

In preparation for this report a site inspection on the 12<sup>th</sup> December 2018 was carried out by the author of this report, to review the area of proposed works in relation to the trees to be retained. Photographs of the site and some of the trees were taken using an iPhone 6- see Appendix E.

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

- AS4373-2007 Pruning of Amenity Trees, Standards Australia;
- AS4970-2009 Protection of Trees on Development Sites;
- Conditions B63 – (Table 1);
- Excerpts of Australian Tree Consultants (ATC) Report. This report is known as M5N-ES-RPT-LRW-0006-08 and dated 26 May 2018;
- Marked up Aerial Maps – see Appendix D – Tree Location Maps.

## 1.3 Tree Preservation and Management Guidelines

The proposed works form part of the approved WestConnex New M5 State Significant Infrastructure project (SSI 6788), which overrides the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 'Vegetation SEPP' (which refers to prescribed and non-prescribed trees pursuant to the Sydney Development Control Plan 2012 (SDCP) Part 3.5.2).

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

- is equal to or greater than three (3) 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 Biosecurity Act 2015 (this Act overrules Noxious Weed Act 1993).

## 2 Observations

### 2.1 Summary of Discussed Trees

Nine (9) trees are included in this report. Details of these are included in the Schedule of Assessed Trees – Appendix F taken from M5N-ES-RPT-LRW-0006-08 and dated 26 May 2018 ATC report. Of these trees:

- eight (8) are prescribed (i.e. ‘considered a tree’ under the DPE approval/conditions) – A1 49, A1 177, A2 97, A2 147, A2 151s, A2 166, A3 29 & A3 122;
- one (1) is non-prescribed – A3 126;
- four (4) trees have high RVs – A1 49, A1 177, A2 97, & A2 166;
- four (4) trees have medium RVs – A2 147, A2 151s, A3 29 & A3 122;
- one (1) tree has a low RV – A3 126.

For Specific Tree Location Refer to original ATC Report - M5N-ES-RPT-LRW-0006-08:

- A1 49 Outside footprint Tree Survey – Area 1 MAP 3 (pdf page 17);
- A1 177 Adjacent to footprint Tree Survey - Area 1 MAP 2 (pdf page 16);
- A2 97 Adjacent to footprint Tree Survey – Area 2 MAP 3 (pdf page 20);
- A2 147 Adjacent to footprint Tree Survey – Area 2 MAP 2 (pdf page 19);
- A2 151s Adjacent to footprint N/A;
- A2 166 Adjacent to footprint Tree Survey – Area 2 MAP 1 (pdf page 18);
- A3 29 Adjacent to footprint Tree Survey – Area 3 MAP 4 (pdf page 25);
- A3 126 Adjacent to footprint Tree Survey – Area 3 MAP 1 (pdf page 22);
- A3 122 Adjacent to footprint Tree Survey – Area 3 MAP 1 (pdf page 22).

### 2.2 Threatened Species

None of the discussed trees are subject to threatened conservation status under Australian and/or State Government legislation (i.e. NSW Biodiversity Conservation Act 2016 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

### 2.3 Proposed Works Methodology

The spacing between lighting poles is determined by Ausgrid and to complement the lights already in place on the western verge of Euston Road, the lights on the eastern side must reflect the lights on the opposite side to optimise lux and lighting levels in the area.

As the lighting on the western verge has been completed, the relocation of the proposed positions of the lighting poles on the eastern verge is not a viable option. Instead selective pruning is proposed as per this report.

The lifting Methodology for the lighting poles is as follows:

- Street light to be assembled nearby on the ground and luminaire wired on;
- Crane/Excavator to attach the sling and lift the pole facing front on to the kerb;
- Light pole lowered into place and fastened to rag bolt assembly;
- The overall 'zone of influence' is 1m wide x 3m long/deep x 10.5m high (see Appendix B for visual representation).

## 2.4 Potential Impacts on Trees Proposed for Retention

Only pruning is proposed to accommodate the light-pole installation, however for several trees (namely A1 49, A1 177, A2 147, A2 166 & A3 122) pruning in excess of 20% of the total live canopy is required. This amount of pruning is outside recommended parameters and will likely create a stress response in the trees.

Almost certainly the trees will respond with prolific epicormic growth (should tree vigour in its current state remain). Short to medium term vigour may be affected for these established street trees, this will be largely influenced by available rainfall over the following six (6) months following the pruning works.

All trees are located on privately owned property, adjacent and outside of the Project footprint. Notwithstanding approval of this Arboricultural Impact Assessment, agreement to prune trees will be obtained from the relevant property owner, prior to undertaking the works.

## 3 Recommendations

### 3.1 Pruning Specification

All pruning shall be carried out by a minimally AQF Level 3 Arborist, prior to the start of pole installation to ensure trees/branches are not damaged.

All pruning shall conform to Australian Standard 4373-2007 (AS4373) Pruning of Amenity Trees and follow Workcover NSW Code of Practice *Amenity Tree Industry* August 1998.

The subject tree limbs pruned during works will be mulched on site and beneficially re-used for construction purposes i.e. ground cover, erosion and sediment control.

#### 3.2.1 Tree A1 49 – Hills Weeping Fig

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems. Potentially one (1) of the three (3) stems to the north/west may require removal right back to the stem junction, all effort is to be made to avoid this stem removal and to remove only lateral, scaffold limbs. However, this will be best judged by the climber (minimum AQF level 3) once in the tree.
- A maximum 35% of the total live canopy is to be removed.
- All pruned branches are to be mulched onsite and be beneficially reused.

### **3.2.2**                    **Tree A1 177 – Swamp Mahogany**

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems. One (1) low limb (stub with epicormics growth only) to the north-west and one (1) 180mm Ø scaffold branch to the south of the canopy is to be removed.
- A maximum 25%-30% of the total live canopy is to be removed.
- All pruned branches are to be mulched onsite and be beneficially reused.

### **3.2.3**                    **Tree A2 97 – Cedar Wattle**

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems. Several small diameter limbs to the north/west side of canopy to be removed.
- A maximum 10% of the total live canopy is to be removed.
- All pruned branches are to be mulched onsite and be beneficially reused.

### **3.2.4**                    **Tree A2 147 – Weeping Bottlebrush**

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems on the north/western side of the canopy. One (1) 100mm Ø and several 60-80mm Ø branches to be removed.
- A maximum 20% of the total live canopy is to be removed.
- All pruned branches are to be mulched onsite and be beneficially reused.

### **3.2.5**                    **Tree A2 151s – Weeping Bottlebrush**

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems on the north/western side of the canopy. A maximum branch diameter of 60mm is to be removed.
- A maximum 10% of the total live canopy is to be removed.
- All pruned branches are to be mulched onsite and be beneficially reused.

### **3.2.6**                    **Tree A2 166 – Lemon Scented Gum**

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems. Two (2) to three (3) branches up to a maximum 120mm Ø are to be removed on the north-western side of the canopy.
- A maximum 15% of the total live canopy is to be removed.
- All pruned branches are to be mulched onsite and be beneficially reused.

### **3.2.7**                    **Tree A3 29 – Weeping Bottlebrush**

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems. One (1) limb to the north-west 80mm Ø and several up to a maximum 40mm Ø are to be removed.
- A maximum 10% of the total live canopy is to be removed.

- All pruned branches are to be mulched onsite and be beneficially reused.

### 3.2.8 Tree A3 126 – European Hackberry

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems. Several small diameter branch tips to be removed.
- A maximum 10% of the total live canopy is to be removed.
- All pruned branches are to be mulched onsite and be beneficially reused.

### 3.2.9 Tree A3 122 – Weeping Bottlebrush

- Pruning as described under Clause 7.3.2 – Reduction prune by removing branches to internal lateral branches or stems. Two (2) low squeezing limbs (150mm & 160mm Ø) to the north-west are to be removed.
- A maximum 35% of the total live canopy is to be removed.
- A representative of WIRES is to be present during pruning works as a bird’s nest (unknown species) is located within this tree. Any direction provided by the WIRES representative is to be strictly followed.
- All pruned branches are to be mulched onsite and be beneficially reused.

## 4 References

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.

Standards Australia AS4373-2007 *Pruning of Amenity Trees*, Standards Australia, Sydney.

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 Chantalle Hughes – December 2018 / January & February 2019



Tree Surgery Certificate  
 Advanced Certificate Urban Horticulture  
 Diploma of Horticulture (Arboriculture) *Credit*  
 Member of the International Society of Arboriculture (ISA)  
 ISA Tree Risk Assessment Qualification (TRAQ) 2016



## 5 Appendices

### 5.1 Appendix A – Terms and Definitions

**Aerial inspection:** where the subject tree is climbed by a professional tree worker/ arborist (typically AQF Level 3) specifically to inspect and assess the tree for signs of symptoms of defects, disease, etc.

#### 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.

**Hazard:** refers to anything with the potential to harm health, life or property.

**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.

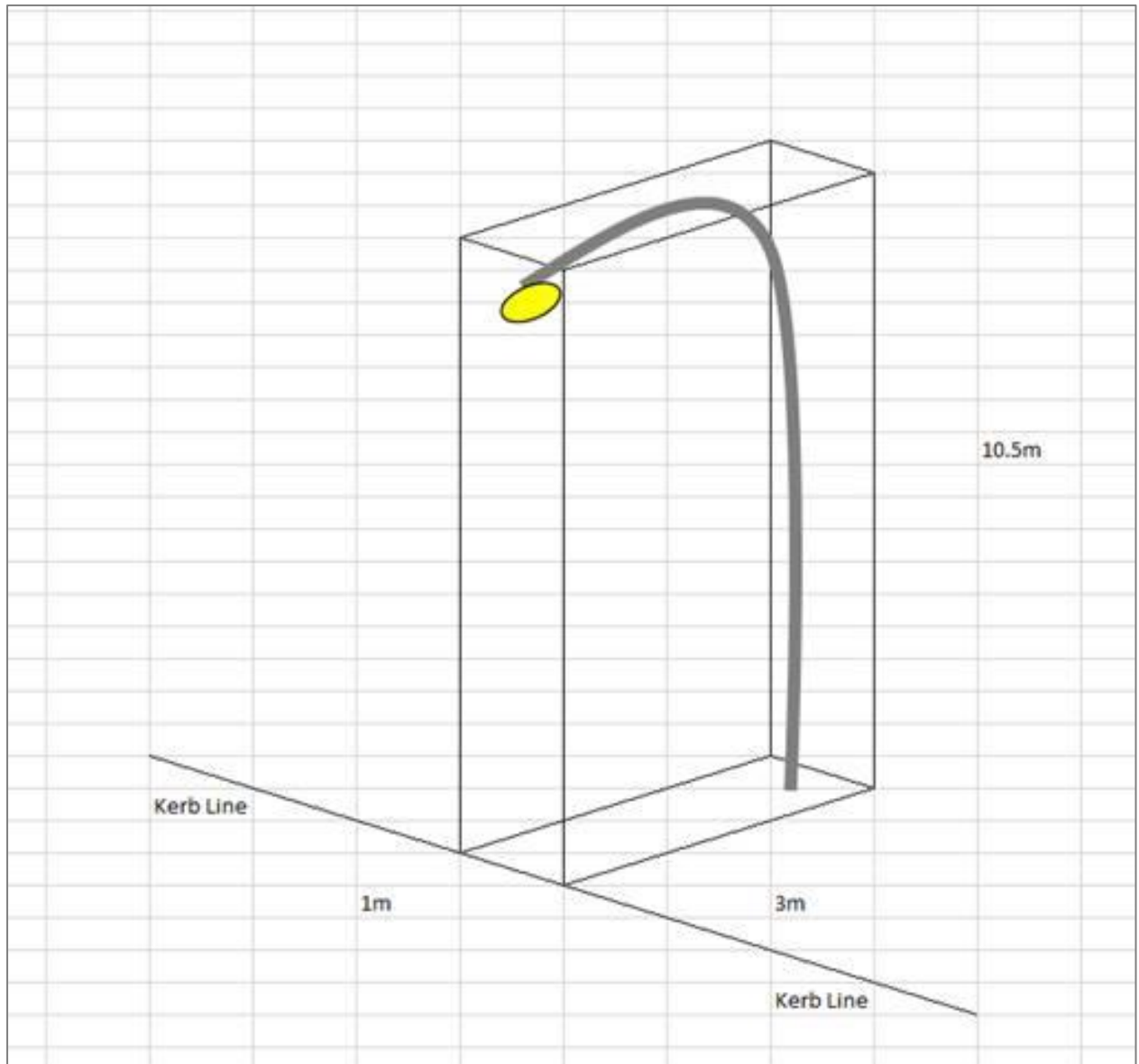
**Scaffold branch/root:** a primary structural branch of the crown or primary structural root of the tree.

**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.

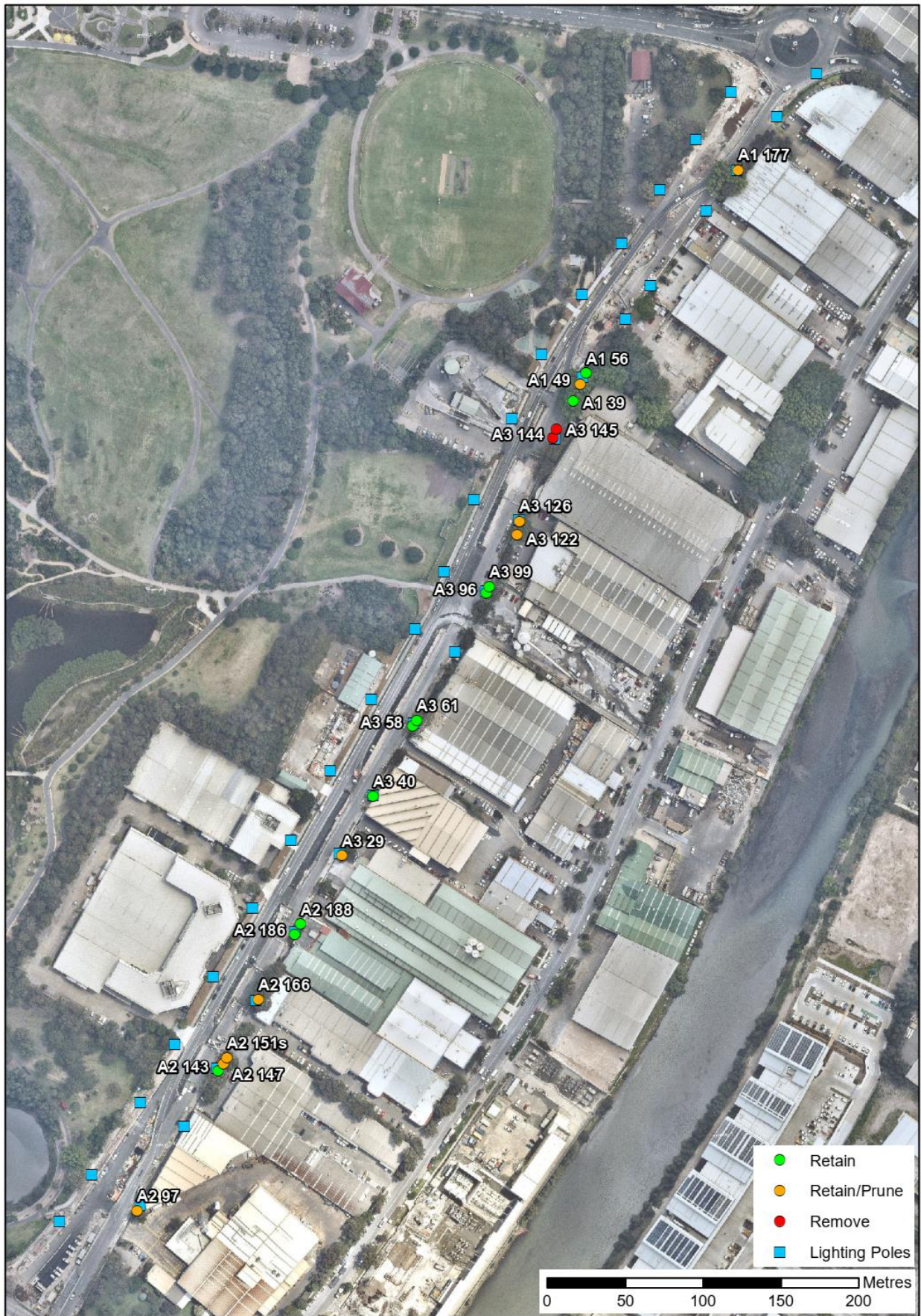


### 5.3 Appendix C – Record of Meetings and Design Input

██████████ (Environmental Advisor) and ██████████ (Project Engineer) attended the site inspection on 12/12/2018 with construction input.

No input from the Landscape Architect has been included as these works are not constrained by any urban design or landscaping requirements.

5.4 Appendix D – Tree Location Maps









## 5.5 Appendix E – Site Photographs



**Plate 1** – Tree A1 49 - Hills Weeping Fig – Arrow notes stem that may require removal to accommodate light pole installation/positioning. It is strongly recommended removal of this entire stem is avoided and only smaller lateral branches removed.





**Plate 2** – A3 122 – Weeping Bottlebrush. Arrows note large low squeezing scaffold branches that require removal. A3 126 can be noted behind A3 122.



Plate 3 – A2 97 – Cedar Wattle – Minor pruning is only required for light installation.

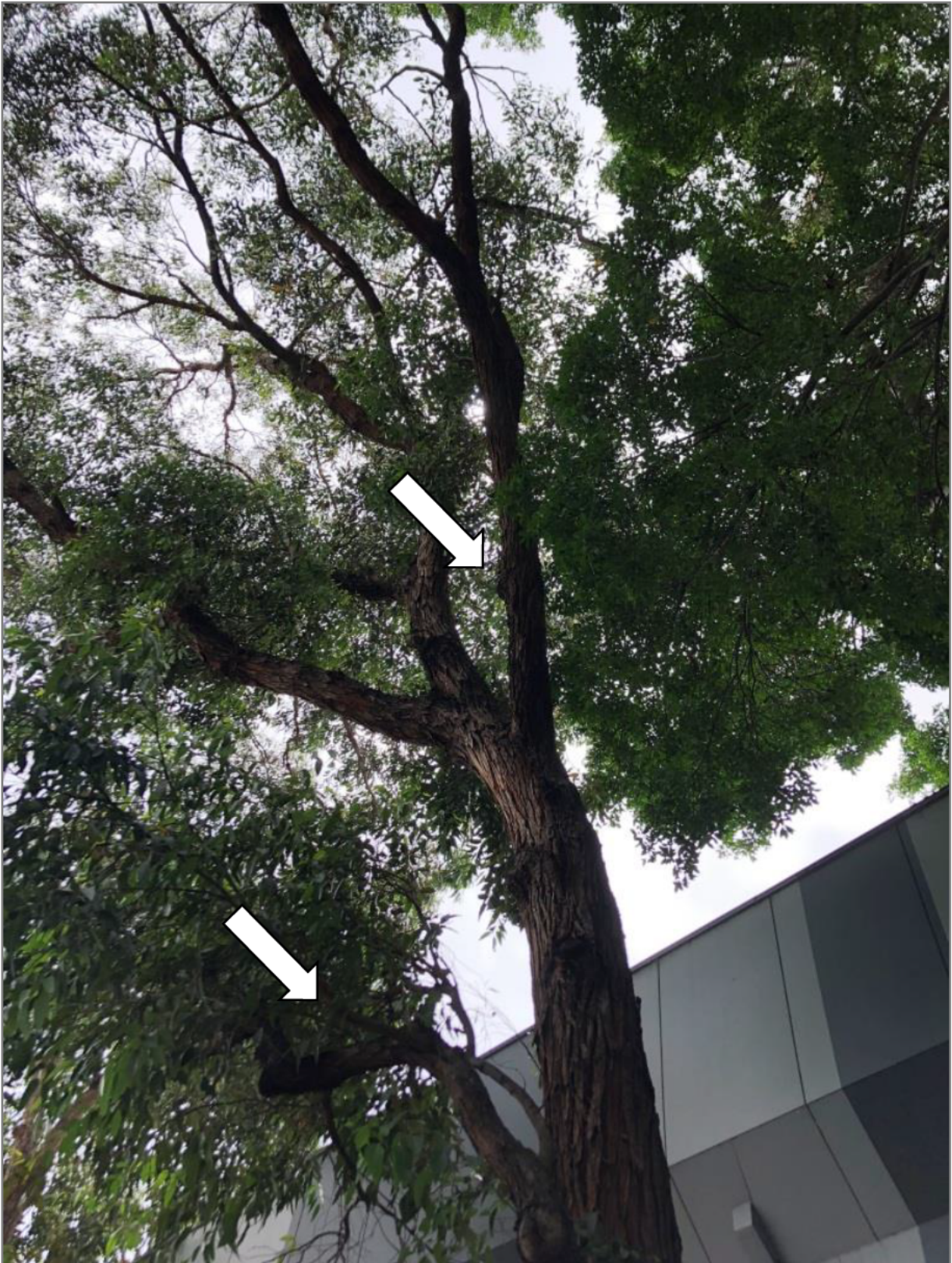


Plate 4 – A1 177 – Swamp Mahogany – Arrows note limbs requiring removal to accommodate light pole installation/positioning.



Plate 5 – A2 147 & A2 151s – Weeping Bottlebrush – Arrow note limbs requiring removal to accommodate light pole installation/positioning.



**Plate 6** – A2 166 – Lemon Scented Gum – Arrow notes tree and limbs requiring removal to accommodate light pole installation/positioning.



**Plate 7** – A3 29 – Weeping Bottlebrush – Arrow notes limbs requiring removal to accommodate light pole installation/positioning.

## 5.6 Appendix F – Schedule of Assessed Trees

Details as per *Australian Tree Consultants (ATC) Report Revision 8 M5N-ES-RPT-LRW-0006-08*, dated 26 May 2018. Any additions/new comments in **red**.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	Corresponding Pole No.	RV	SRZ (m)	TPZ (m)	TPZ (area)
A1 49	<i>Ficus microcarpa</i> var <i>hillii</i> <b>Hills Weeping Fig</b>	15	14	1750	M	G	G	No specific tree comments provided in original report.	Pole 47	H	4.4	15	707
A1 177	<i>Eucalyptus robusta</i> <b>Swamp Mahogany</b>	14	7	500	M	G	F	No specific tree comments provided in original report.	Pole 37	H	2.7	6	163
A2 97	<i>Acacia elata</i> <b>Cedar Wattle</b>	14	8	450	M	G	G	No specific tree comments provided in original report.	Pole 37	H	2.5	5.4	92
A2 147	<i>Melaleuca</i> (previously <i>Callistemon</i> ) <i>viminalis</i> <b>Weeping Bottlebrush</b>	6	3	350	M	G	G	No specific tree comments provided in original report.	Pole 151	M	2.3	4.2	55
A2 151s	<i>Melaleuca</i> (previously <i>Callistemon</i> ) <i>viminalis</i> <b>Weeping Bottlebrush</b>	7	8	450	M	G	G	No specific tree comments provided in original report.	Pole 151	M	2.5	5.4	92
A2 166	<i>Corymbia citriodora</i> <b>Lemon Scented Gum</b>	17	12	600	M	G	G	No specific tree comments provided in original report.	Pole 137	H	2.8	7.2	163
A3 29	<i>Melaleuca</i> (previously <i>Callistemon</i> ) <i>viminalis</i> <b>Weeping Bottlebrush</b>	8	5	350	M	G	G	No specific tree comments provided in original report.	Pole 111	M	2.3	4.2	55
A3 126	<i>Celtis australis</i> <b>European Hackberry</b>	3	2	150	EM	F	F	No specific tree comments provided in original report.	Pole 67	L	1.6	2	10
A3 122	<i>Melaleuca</i> (previously <i>Callistemon</i> ) <i>viminalis</i> <b>Weeping Bottlebrush</b>	4	4	200	M	G	F	No specific tree comments provided in original report.	Pole 67	M	1.8	2.4	18

### KEY



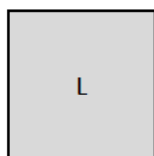
Tree to be retained.



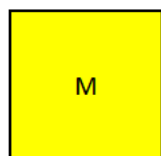
Not classed as 'a tree' under DPE conditions (see Part 1.3).



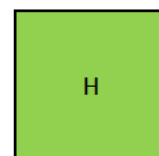
Tree proposed to be removed.



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



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



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

**NOTE- SRZ CALCULATION - A 12.5% calculation has been added to the DBH, whilst this is not as accurate as manually measuring the trees above the root buttress (as per AS4970-2009), it should be a better reflection of the true SRZ than taking the measurement off the DBH as per original report.**

Author of this report did not re-inspect trees in relation to dimensions, age, vigour, condition or Retention Value (RV.)

AS4970-2009 states TPZ should be no greater than a 15m radial distance.

To the authors knowledge, *Callistemon viminalis* has been re-classified as *Melaleuca viminalis* by the state herbaria.

**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.

**RV** Refers to the retention value of a tree, usually based on the tree's ULE *and* Tree Significance. The author does not know which method ATC used to obtain RV.

**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.