

Arboricultural Impact Assessment



Prepared For

CPS Dragados Samsung Joint Venture (CDS-JV)
30 Garema Ct
KINGSGROVE NSW 2208

Site Address

South/West Kindalin Underpass
Beverly Hills NSW 2209

Prepared by

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-WSW-0009-02

September 2017

Contents

Introduction.....	2
1.1 Brief.....	2
1.2 Methodology.....	3
1.3 Tree Preservation and Management Guidelines	4
Observations and Discussion.....	4
2.1 Summary of Assessed Trees.....	4
2.2 Threatened Species.....	5
2.3 Proposed Removal of Prescribed Trees	5
2.4 Proposed Tree Retention	9
2.5 Potential Impacts on Trees Proposed for Retention	10
Recommendations.....	11
3.1 Tree Removal	11
3.2 Minimising Impacts on Trees to be Retained.....	11
Tree Protection Measures.....	14
4.1 Tree Protection Devices	14
4.2 Stockpiling and Location of Site Sheds.....	14
4.3 Fill Material	15
4.4 Fencing and Walls within the SRZ and TPZ of Retained Trees.....	15
4.5 Pavements.....	15
4.6 Hygiene Practices	15
Post Construction Tree Care Measures	15
5.1 Mulching	15
5.2 Irrigation.....	15
5.3 Pest Management.....	15
5.4 Hazard Management.....	15
References.....	16
Appendices	17
7.1 Appendix A - Terms and Definitions.....	17
7.2 Appendix B - ULE Guide.....	18
7.3 Appendix C - STARS - Significance of a Tree Assessment Rating System (IACA 2010)©	19
7.4 Appendix D - Record of Meetings	21
7.5 Appendix E - Site Overview Map.....	22
7.6 Appendix F - Tree Location Maps.....	23
7.7 Appendix G - Schedule of Assessed Trees.....	29
7.8 Appendix H - Photographs	43
7.9 Appendix I - Tree Group 26 & 39A Details	46

Introduction

1.1 Brief

This Arboricultural Impact Assessment (AIA) was prepared by Treeism Arboricultural Services and was commissioned by [REDACTED] of CPS Dragados Samsung Joint Venture (CDS-JV).

“The site” is described as the South/West Kindalin Underpass. This is an area of Road and Maritime Service owned land, running north to south between the existing ‘M5 East’ wall barrier and Woolli Creek and east to west between Tallawalla St pedestrian walkway and Kooemba Avenue, Beverly Hills, New South Wales. The trees located on the outskirts of Tallawalla Reserve closest to the proposed works were also assessed. The overall subject site location is attached as Appendix E - Site Overview Map.

The proposed works are part of the larger WestConnex New M5 project. The scope of work specifically for the discussed area is:

- road widening in the area;
- replacement of acoustic barriers;
- temporary node diversion.

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.

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, 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).

Table 1 –Condition of Approval B63 Compliance Table

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 – Overview & individual area as per Appendix E & F.
B63(a)	a visual tree assessment with inputs from the design, landscape architect, construction team;	VTA noted in Appendix F & I staff inputs as per Appendix D and onsite discussions.
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.	Appendix D, 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, and storage of materials and protection of public utilities.	Section 2 Part 2.4-2.5 & Section 3 - Recommendations
	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.	Consistent with earlier approved Tree Reports replanting will be detailed in the Urban Design & Landscape Plan in consultation with the relevant Council.

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 21st December 2016, 5th and 6th January 2017. Inspection details of these trees are provided in Appendix G –Schedule of Assessed Trees.

The tree heights were visually estimated, unless otherwise noted in Appendix G, 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.

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);
- Marked up Aerial maps detailing proposed works location. These plans are attached as Appendix E—Site Overview Map & Appendix F- Tree Location Maps.

No hydraulic service or landscape plans have been reviewed in preparation of this report.

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 Sydney Local Environment Plan 2012 (SLEP) 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

One hundred and twenty eight (128) trees/tree groups were assessed and included in this report. Details of these are included in the Schedule of Assessed Trees – Appendix G. Of these trees:

- one hundred and twenty (120) are prescribed (i.e. ‘considered a tree’ under the DPE approval/conditions) trees/tree groups – Trees 1-5, Group 6, Trees 7-10, 12-17, 19-25, Group 26, Trees 27-38, Group 39A, Trees 39-61, Group 65, Tree 66, Group 67, Tree 68, Trees 69-77, Trees 79, 81-89, 91-96, 98-101, Group 101A, Trees 102-126; and
- eight (8) are non-prescribed trees/tree groups (i.e. exempt from DPE approval to remove or prune), - Group 11 & 18 (weed species), Trees 63 & 64 (dead), Tree 78 (failed, dangerous), Tree 80 (dead), Tree 90 (dead) and Tree 97 (weed species). It is assumed that all these non-prescribed trees would be removed if located within or near the proposed works zone.

Of the one hundred and twenty eight (128) trees/tree groups the following Retention Value (RV- see Appendix C) was ascribed to each:

- five (5) trees/tree groups have High RVs – Trees 2, 3, Group 26, 39A & 68 (trees within groups were provided a retention rating as a group rather than as individual trees;
- one hundred and four (104) trees/tree groups have Medium RVs - Trees 1, 4, 5, Group 6, Trees 7-9, 12-17, 19-25, Trees 27-38, Trees 39-61, 66, Group 67, Trees 69-71, 73, 75, 77, 79, 81- 88, 91-96, 98, 100-102, 104-106, 108-126; and
- nineteen (19) trees/tree groups have Low RVs - Tree 10, Groups 11, 18, 62, 63, Tree 64, Group 65, Tree 72, 74, 76, 78, 80, 89, 90, 97, 99, 101A, 103, 107.

2.2 Threatened Species

No species of assessed tree is subject to threatened conservation status under Australian and/or State Government legislation (i.e. NSW Threatened Species Conservation Act 1995 and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999).

All assessed trees within this report have been, in the author’s opinion, planted or are self-sown weed species).

2.3 Proposed Removal of Prescribed Trees

One hundred and nine (109) of the one hundred and twenty (120) prescribed trees/tree groups are proposed to be removed as they are located within the zone of the proposed works and cannot be retained without detriment to the tree.

One (1) tree determined to have a ‘High’ Retention Value (RV- see Appendix C) is proposed for removal. The trees within the table below are located within the footprint of the works and cannot be safely retained.

The site consists of a narrow corridor between the existing M5 barrier wall and creek. The steep embankment (discussions with staff indicate significant benching will be required to make the site safe and stable) and the existing stormwater, sewer and telecommunications services in this location make the use of Vac trucks or an air-spade for trenching unfeasible. In addition, a vac truck would still require clearing and benching of the same area for access purposes, thus significant root loss will incur, causing trees to become unstable.

Refer to Appendix E – Site Overview Map and Appendix F – Tree Location Maps for aerial indication of proposed work within tree TPZs.

Given the proposed road widening and existing creek level I am lead to believe that the embankment on the western end of the site (Refer to Appendix E – Site Overview Map) will require re-grading.

Significant soil level changes are unacceptable within the Tree Protection Zones (TPZ) of existing trees, lowering ground levels incurs root severance and raising ground levels significantly leads to loss of available oxygen to tree roots and long term root death.

Table 2—Trees proposed to be removed to facilitate works.

Tree No.	Common Name	Reason	RV
3	Broad Leaved Paperbark	To avoid the necessity of removing Trees 1, 2 & 4 for the proposed access road I believe a redesign is required to move the road to the south-east, this tree will be within the footprint of this redesigned road.	H
5	Gum	Tree has significant lean over proposed access road, pruning cannot be carried out to provide required clearance without detriment to the tree.	M
7	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works, significant ground level changes are proposed within the TPZ.	M
8	Swamp She-Oak	Tree positioned in location of proposed ITS relocation works.	M
9	Lilly Pilly	Tree positioned in a location adjacent to the proposed ITS relocation works, significant ground level changes are proposed within the TPZ.	M
10	Golden Wattle	Tree positioned in location of proposed ITS relocation works.	L
12	Gum	Tree positioned in a location adjacent to the proposed ITS relocation works, significant ground level changes are proposed within the TPZ.	M
13	Swamp Mahogany	Tree positioned in location of proposed ITS relocation works.	M
14	River She-Oak	Tree positioned in location of proposed ITS relocation works.	M
15	River She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works, significant ground level changes are proposed within the TPZ.	M
16	River She-Oak	Tree positioned in location of proposed ITS relocation works.	M
17	River She-Oak	Tree positioned in location of proposed ITS relocation works.	M
19	Swamp Mahogany	Tree positioned in location of proposed ITS relocation works.	M
20	River She-Oak	Tree positioned in location of proposed ITS relocation works.	M
21	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
22	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
23	Swamp She-Oak	Tree positioned in location of proposed ITS relocation works.	M
24	Gum	Tree positioned in location of proposed ITS relocation works.	M
25	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
29	Swamp Mahogany	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
31	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
32	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
33	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
34	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
35	Wattle	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
36	Swamp Mahogany	Tree positioned in location of proposed ITS relocation works.	M

Tree No.	Common Name	Reason	RV
38	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
39	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
40	Swamp Mahogany	Tree positioned in location of proposed ITS relocation works.	M
41	River She-Oak	Tree positioned in location of proposed ITS relocation works.	M
42	River She-Oak	Tree positioned in location of proposed ITS relocation works.	M
43	Swamp Mahogany	Tree positioned in location of proposed ITS relocation works.	M
44	Wattle	Tree positioned in a location of proposed new retaining wall and is adjacent to the proposed ITS relocation works.	M
45	Swamp She-Oak	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
47	Wattle	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
48	Swamp Mahogany	Tree positioned in a location adjacent to the proposed ITS works.	M
49	Wattle	Tree positioned in a location adjacent to the proposed ITS relocation works.	M
50	Wattle	Tree positioned in a location of proposed new retaining wall and is adjacent to the proposed ITS relocation works.	M
51	Swamp She-Oak	Tree positioned in a location of proposed new retaining wall and is adjacent to the proposed ITS relocation works.	M
52	Swamp Mahogany	Tree positioned in a location of proposed new retaining wall and is adjacent to the proposed ITS relocation works.	M
53	Swamp She-Oak	Tree positioned in location of proposed ITS relocation works.	M
54	Swamp Mahogany	Tree positioned in location of proposed ITS relocation works.	M
55	River She-Oak	Tree positioned in a location of proposed new retaining wall.	M
56	River She-Oak	Tree positioned in a location of proposed new retaining wall.	M
57	River She-Oak	Tree positioned in a location of proposed new retaining wall.	M
58	River She-Oak	Tree positioned in location of proposed ITS relocation works.	M
59	River She-Oak	Tree positioned in a location of proposed new retaining wall.	M
60	Wattle	Tree positioned in a location of proposed new retaining wall.	M
61	Swamp She-Oak	Tree positioned in location of proposed ITS relocation works.	M
G65	Wattle	Trees positioned in location of proposed ITS, re-grading of embankment and retaining wall works.	M
66	Swamp She-Oak	Tree positioned in a location of proposed new retaining wall and re-grading of embankment.	M
G67	Swamp Mahogany, Wattle & Sweet Pittosporum	Trees positioned in location of proposed ITS, re-grading of embankment and retaining wall works.	M
69	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
70	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
71	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
72	Wattle	Tree almost dead and positioned in location of proposed re-grading of embankment and retaining wall works.	L
73	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M

Tree No.	Common Name	Reason	RV
74	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	L
75	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
76	Wattle	Tree almost dead and positioned in location of proposed re-grading of embankment and retaining wall works.	L
77	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
79	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
81	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
82	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
83	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
84	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
85	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
86	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
87	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
88	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
89	Wattle	Tree almost dead and positioned in location of proposed re-grading of embankment and retaining wall works.	L
91	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
92	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
93	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
94	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
95	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
96	River She-Oak	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
98	Sweet Pittosporum	Tree positioned in location of proposed re-grading of embankment.	M
99	Wattle	Tree positioned in location of proposed re-grading of embankment.	L
100	Tallowwood	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
101	Sweet Pittosporum	Tree positioned in location of proposed re-grading of embankment.	M
101A	Wattle	Tree positioned in location of proposed re-grading of embankment.	L
102	Fig	Tree positioned in location of proposed re-grading of embankment.	M
103	Wattle	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	L

Tree No.	Common Name	Reason	RV
104	Sweet Pittosporum	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
105	Gum	Tree positioned in location of proposed re-grading of embankment.	M
106	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment.	M
107	Wattle	Tree almost dead and positioned in location of proposed re-grading of embankment..	L
108	River She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
109	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
110	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment.	M
111	Swamp She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
112	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment and retaining wall works.	M
113	Swamp She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
114	Swamp She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
115	Swamp She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
116	Melaleuca	Tree positioned in location of proposed re-grading of embankment.	M
117	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment.	M
118	Swamp She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
119	Melaleuca	Tree positioned in location of proposed re-grading of embankment.	M
120	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment.	M
121	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment.	M
122	Swamp Mahogany	Tree positioned in location of proposed regrading of embankment.	M
123	Swamp Mahogany	Tree positioned in location of proposed re-grading of embankment.	M
124	River She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
125	River She-Oak	Tree positioned in location of proposed re-grading of embankment.	M
126	River She-Oak	Tree positioned in location of proposed re-grading of embankment.	M

2.4 Proposed Tree Retention

The following trees are proposed/recommended to be retained;

- Tree 1 - *Eucalyptus microcorys* (Tallowwood),
- Tree 2 - *Eucalyptus microcorys* (Tallowwood),

- Tree 4 - *Eucalyptus microcorys* (Tallowwood),
- Group 6 – *Casuarina glauca* (Swamp She-Oak) x 25 & *Eucalyptus* sp. X 4,
- Group 26 - *Casuarina glauca* (Swamp She-Oak) x 14, *Eucalyptus* sp. X 6, *Eucalyptus tereticornis* (Forest Red Gum) x 14, *Eucalyptus robusta* (Swamp Mahogany) x 3 & *Eucalyptus punctata* (Grey Gum) x 1,
- Tree 27 – *Casuarina glauca* (Swamp She-Oak),
- Tree 28 – *Acacia* sp. (Wattle)
- Tree 37 – *Casuarina glauca* (Swamp She-Oak),
- Group 39A - *Casuarina glauca* (Swamp She-Oak) x 14 & *Eucalyptus* sp. X 2, *Eucalyptus tereticornis* (Forest Red Gum) x 6, *Eucalyptus robusta* (Swamp Mahogany) x 10, *Acacia* sp. (Wattle),
- Tree 46 - *Casuarina glauca* (Swamp She-Oak),
- Group 68 - *Casuarina glauca* (Swamp She-Oak), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus pilularis* (Blackbutt).

2.5 Potential Impacts on Trees Proposed for Retention

Under the Australian Standard 4970-2009 Protection of trees on development sites (“AS4970”), encroachments of less than 10% of the Tree Protection Zone (TPZ) are considered to be minor. No specifications are provided in AS4970 for potential impacts of 10% or greater. This 10% is taken as the threshold figure, beyond which arboricultural investigations (as set out in clause 3.3.4) need to be considered.

Without a detailed Survey Plan estimates have been provided via the aerial mapping to determine likely disturbance within the Structural Root Zone (SRZ), and into the TPZs of protected trees to be retained, these are summarised in Table 3, below/next page.

Table 3 – Estimated encroachments into the SRZ and TPZ of trees proposed for retention. Please note site-specific constraints will heavily influence the presence of roots in a particular location. The type of construction materials and methods used, and/or extent of change to soil/grade conditions during works may result in encroachment impacts lower or higher than estimated at the time of preparing this tree impact assessment.

Tree No.	Tree Common name	SRZ affected	TPZ area (m ²)	TPZ encroachment
1	Tallowwood	✓	255	✓
2	Tallowwood	✓	499	✓
4	Tallowwood	✗	222	✓
G6	Gum & Swamp She-Oak	✗	28	0
G26	Forest Red Gum, Swamp Mahogany, Grey Gum, Gum & Swamp She-Oak	✗	55	Possible on some specimens
27	Swamp She-Oak	✗	10	Possible
28	Wattle	?	7	Possible
37	Swamp She-Oak	✗	10	Possible
G39A	Forest Red Gum, Swamp Mahogany, Wattle, Gum & Swamp She-Oak	✗	41	Possible on some specimens

Tree No.	Tree Common name	SRZ affected	TPZ area (m ²)	TPZ encroachment
46	Swamp She-Oak	×	7	Possible
G68	Forest Red Gum, Swamp Mahogany, Blackbutt & Swamp She-Oak	×	55	0

Recommendations

3.1 Tree Removal

The one hundred and nine (109) trees/tree groups required to be removed to accommodate the proposed works. Replanting will be undertaken in accordance with the condition B63 of the Compliance Table.

3.2 Minimising Impacts on Trees to be Retained

Tree 1- *Eucalyptus microcorys* (Tallowwood)

It is proposed that the existing bitumen pathway through Tallawalla Reserve be used for site vehicular access past this existing park tree. Redesign should occur and the proposed roadway should be relocated further south-east, in addition to this the following is advised:

- Any ground-level change within 3m of the tree is to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.
- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* will be required by a minimally qualified AQF Level 3 Arborist prior to works commencing.
- Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- It is recommended that Track mat or wide timber sheeting shall be placed on top of the existing ground level within the 9m radial distance of the tree (to the south and east) should vehicles be accessing the area.
- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.

Tree 2 - *Eucalyptus microcorys* (Tallowwood)

Again it is proposed that the existing bitumen pathway through Tallawalla Reserve be used for site vehicular access past this existing park tree. Redesign should occur and the proposed roadway should be relocated further south-east, in addition to this the following is advised:

- Any ground level change within 3.4m of the tree is to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.
- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* will be required by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- It is recommended that Track mat or wide timber sheeting shall be placed on top of the existing ground level within the 12.6m radial distance of the tree (to the south and east) should vehicles be accessing the area.

- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.

Tree 4 - *Eucalyptus microcorys* (Tallowwood)

This tree will be affected by the proposed use of the existing bitumen pathway through Tallawalla Reserve for site vehicular access also. Redesign should occur and the proposed roadway should be relocated further south-east, in addition to this the following is advised:

- Any ground level change within 2.9m of the tree is to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.
- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* will be required by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- It is recommended that Track mat or wide timber sheeting shall be placed on top of the existing ground level within the 8.4m radial distance of the tree (to the south and east) should vehicles be accessing the area.
- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.

Group 6 - *Casuarina glauca* (Swamp She-Oak) & *Eucalyptus* sp.

These trees are afforded protection from the proposed work by the Wollie Creek concrete drain and no branches hang over the work zone. Protection for the western edge of the group may be required in relation to vehicular access to the site along the Tallawalla Reserve should this access be utilised.

- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.

Group 26 - *Casuarina glauca* (Swamp She-Oak), *Eucalyptus* sp. *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus robusta* (Swamp Mahogany) and *Eucalyptus punctata* (Grey Gum)

As these trees are located within the area where the Wollie Creek concrete drainage is underground, trees on the northern boundary of the group may require pruning and root severance may occur. Further information is required for comprehensive encroachment assessment.

- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.
- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* may be required (on trees located on the northern edge) by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- Any ground level changes within 2.2m on the northern side of the trees are to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.

Tree 27 - *Casuarina glauca* (Swamp She-Oak)

This tree is located within the area where the Wollie Creek concrete drainage is underground. Although the tree is located on the boundary it is possible pruning, or root severance may occur. Further information is required for comprehensive encroachment assessment.

- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.

- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* may be required by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- Any ground level change within 1.5m of the tree is to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.

Tree 28 - *Acacia* sp. (Wattle)

This tree is located within the area where the Wolli Creek concrete drainage is underground. Although the tree is located on the boundary it is possible pruning, or root severance may occur. Further information is required for comprehensive encroachment assessment.

- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.
- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* may be required by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- Any ground level change within 1.5m of the tree is to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.

Tree 37 - *Casuarina glauca* (Swamp She-Oak)

This tree is located within the area where the Wolli Creek concrete drainage is underground. Although the tree is located on the boundary it is possible pruning, or root severance may occur. Further information is required for comprehensive encroachment assessment.

- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.
- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* may be required by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- Any ground level change within 1.5m of the tree is to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.

Group 39A - *Casuarina glauca* (Swamp She-Oak), *Eucalyptus* sp. *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus robusta* (Swamp Mahogany) & *Acacia* sp. (Wattle)

These trees are afforded protection from the proposed work by the concrete drain 'Wolli Creek' and no branches hang over the work zone. No further action/measures are required.

Tree 46 - *Casuarina glauca* (Swamp She-Oak)

This tree is located within the area where the Wolli Creek concrete drainage is underground. Although the tree is located on the southern side of the drain it is possible pruning, or root severance may occur. Further information is required for comprehensive encroachment assessment.

- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.
- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* may be required by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any

pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.

- Any ground level change within 1.5m of the tree is to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.

Group 68 - *Casuarina glauca* (Swamp She-Oak), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus robusta* (Swamp Mahogany) & *Eucalyptus pilularis* (Blackbutt)

These trees are located within the area where the Wolli Creek concrete drainage is underground. Trees on the northern boundary of the group may require pruning and root severance may occur. Further information is required for comprehensive encroachment assessment.

- Crown-lift pruning to Australian Standard 4373-2007 *Pruning of Amenity Trees* will be required (on trees located on the northern edge) by a minimally qualified AQF Level 3 Arborist prior to works commencing. Any pruning in excess of 10% of the total live canopy shall be as advised by the project arboriculturist or Council.
- Any ground level changes within 2.2m on the northern side of the trees are to be directly supervised by an arboriculturist with a minimum AQF5 in arboriculture or Council.
- Tree protection is to be placed as per Tree Protection Measures Part 4.1 below, prior to and during works.

Tree Protection Measures

4.1 Tree Protection Devices

The tree protection is to be in accordance with the following:

- Tree Protection Devices (TPD) may include mulching, tree guards and other devices other than fencing.
- The TPD must be in place prior to any site works commencing, including clearing, demolition or grading.
- The most appropriate fencing for tree protection is 1.8m chainlink with 50mm metal pole supports. During installation, care must be taken to avoid damage to significant roots. The practicality of providing this fencing on this site must be addressed by the arboriculturist.
- Locate large primary roots by careful removal of soil within the fencing area. Do not drive any posts or pickets into tree roots. Replace soil back over tree roots.
- Nothing should occur inside the tree protection fenced areas, so therefore all access is prohibited for personnel and machinery, storage of fuel, chemicals, cement and site sheds.
- Signage should explain exclusion from the area defined by TPD and carry a contact name for access or advice.
- The TPD cannot be removed, altered, or relocated without the project arborist's prior assessment and approval.

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 Fill Material

- Placement of fill material within the TPZ of trees to be retained should be avoided where possible. Where placement of fill cannot be avoided, the material should be a coarse, gap graded material such as 20 — 50mm crushed basalt or equivalent to provide some aeration to the root zone. Note that roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose.
- The fill material should be consolidated with a non-vibrating roller to minimise compaction of the underlying soil.
- A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade. No fill material should be placed in direct contact with the trunk.

4.4 Fencing and Walls within the SRZ and TPZ of Retained Trees.

- Where fencing and/or masonry walls are to be constructed along site boundaries, they must provide for the presence of any living woody tree roots greater than 50mm diameter.
- Hand digging must occur within the SRZ of trees to be retained.
- For masonry walls or fences it may be acceptable to replace continuous concrete strip footings with suspended in-fill panels (e.g. steel or timber pickets, lattice etc) fixed to pillars.

4.5 Pavements

- Where possible pavements should be avoided within the TPZ of trees to be retained.
- Proposed paved areas within the TPZ of trees to be retained are to be placed above grade to minimise excavations within the root zone, avoiding root severance and damage.

4.6 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.

Post Construction Tree Care Measures

5.1 Mulching

The removal of mulch after construction to remove any contaminants and its replacement with a good quality mulch and addition of 10% organic matter will improve beneficial soil micro-organisms, retain moisture and improve aeration and water infiltration.

5.2 Irrigation

An arboriculturist should determine whether irrigation should be carried out during extended periods of drought.

5.3 Pest Management

Monitoring is required, as trees under stress are more prone to insect attack

5.4 Hazard Management

Monitoring, management and routine re-assessment of the trees by a qualified arboriculturist is required for adequate long-term safety of residents.

References

Credit to Catriona Mackenzie 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.

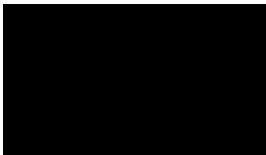
Standards Australia AS4373-2007: *Pruning of Amenity Trees*, Standards Australia, Sydney.

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 [REDACTED] – September, 2017



Consulting arboriculturist and horticulturist.
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

Appendices

7.1 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.

7.2 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

7.3 Appendix C - STARS - Significance of a Tree Assessment Rating System (IACA 2010)© (1 of 2)

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.

Appendix C - STARS - Significance of a Tree Assessment Rating System (IACA 2010)© (2 of 2)

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

7.4 Appendix D - Record of Meetings

WestConnex New M5



Meeting Minutes

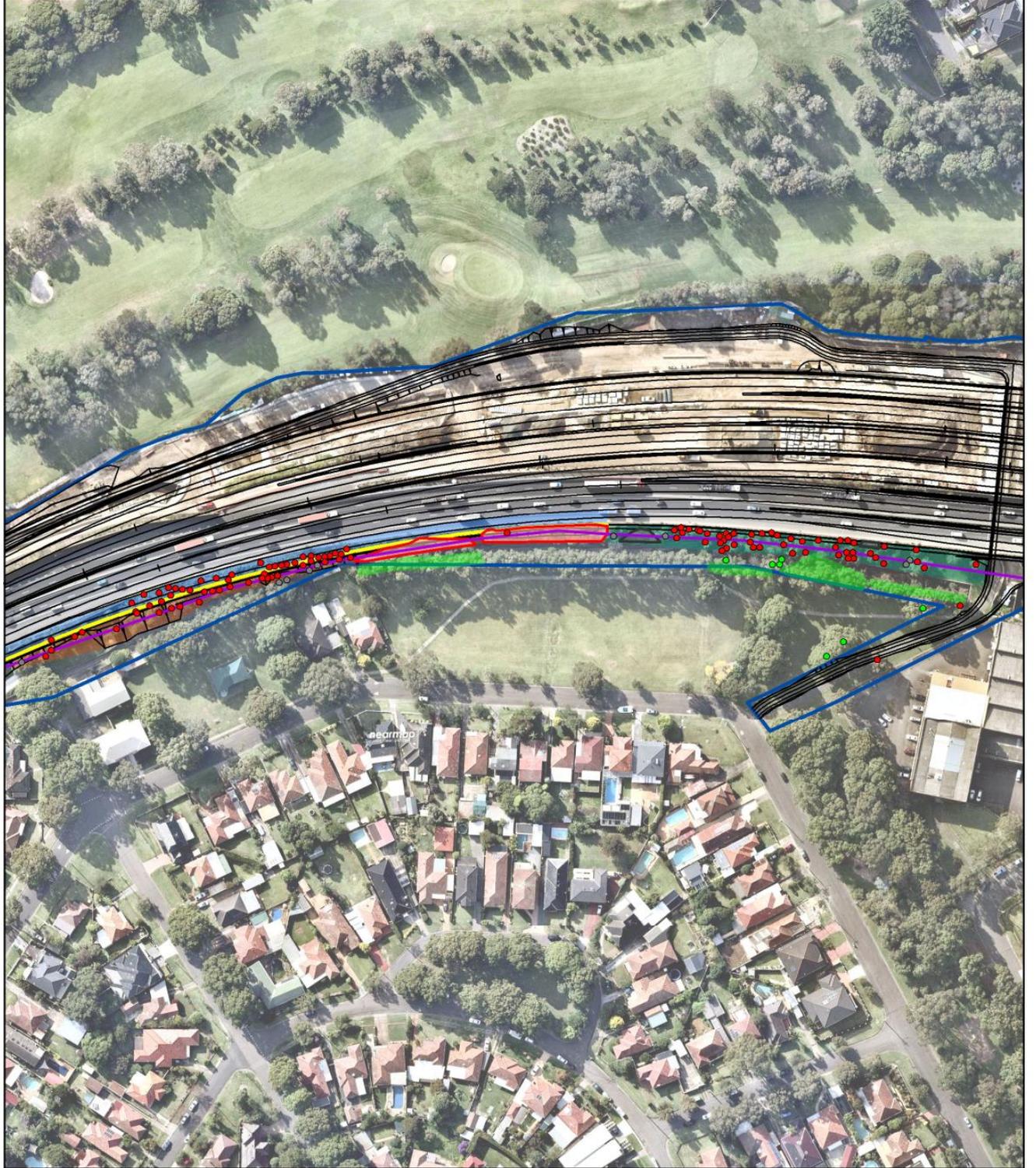
MEETING Tree Assessment – South / West Kindalin Underpass
DATE Wednesday 21st December 2016
TIME 10:00am – 11:00am
VENUE WestConnex New M5, Kingsgrove, 30 garema Ct
 Garema Room

ATTENDEES [Redacted]

APOLOGIES Nil

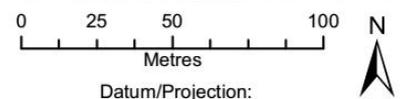
ITEM	DESCRIPTION	ACTION BY	DATE REQUIRED	DATE CLOSED
1	Construction Information			
1.1	Project overview and context given. Maps of assessment area discussed and provided to CH. SB to provide access to Westconnex GIS system if needed.	SB	TBC	
1.2	Construction Information <ul style="list-style-type: none"> - Road widening in the area - Replacement of acoustic barriers - Temporary node diversion 	Note		
2	Urban Design Information			
2.1	Information supplied by Landscape Architect [Redacted] (Hassell) provided to [Redacted]. This explained that a section immediately west of the Kindalin underpass will potentially have little impact from an Urban Design perspective.	Note		
3	Design Input			
3.1	SR explained that detailed design on the temporary node relocation has been decided yet. This information will be provided early 2017.	SR	Early 2017	
4	Report Requirements			
4.1	Condition B63 was provided to CH	Note		
4.2	Important Sections in Report: <ul style="list-style-type: none"> - A compliance table with B63 - To ensure trees with structural root encroachment specifies percentage - Explain why trees are in poor health 	Note		

Tree Survey - South-west Kindalin, Kingsgrove Overview



Legend

- Inside Project Boundary, Remove
- Retain
- Non-Prescribed Tree
- Surface Road Design
- ITS Secondary Cableway Trench
- ▭ Project Deed Boundary
- ▭ Noise Barrier
- ▭ Associated Batter Works
- ▭ New Bypass Extension
- ▭ Required for Trenching Permanent ITS



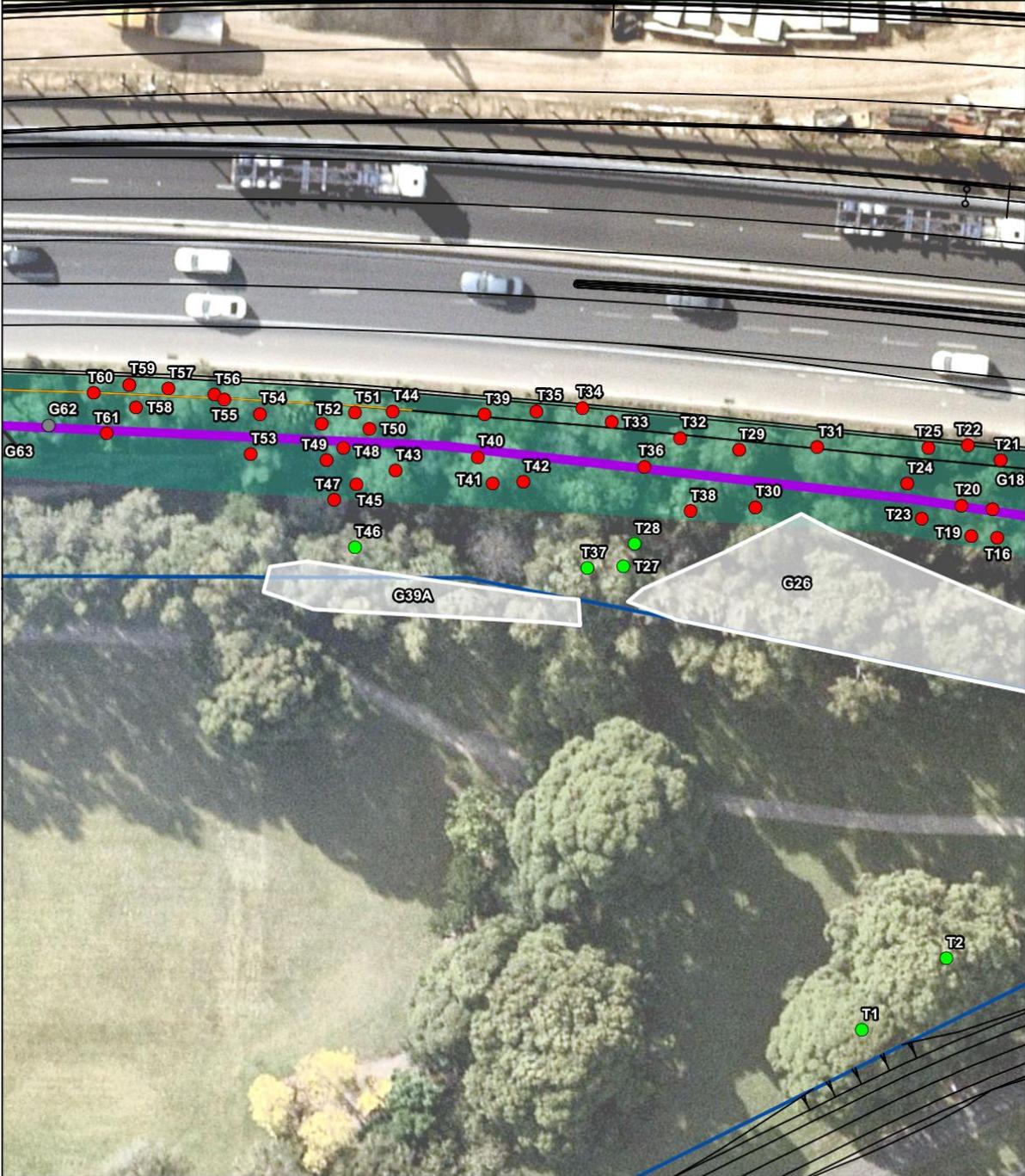
Datum/Projection:
GDA 1994 MGA Zone 56

Prepared by: Date: 11/08/2017

7.6 Appendix F - Tree Location Maps



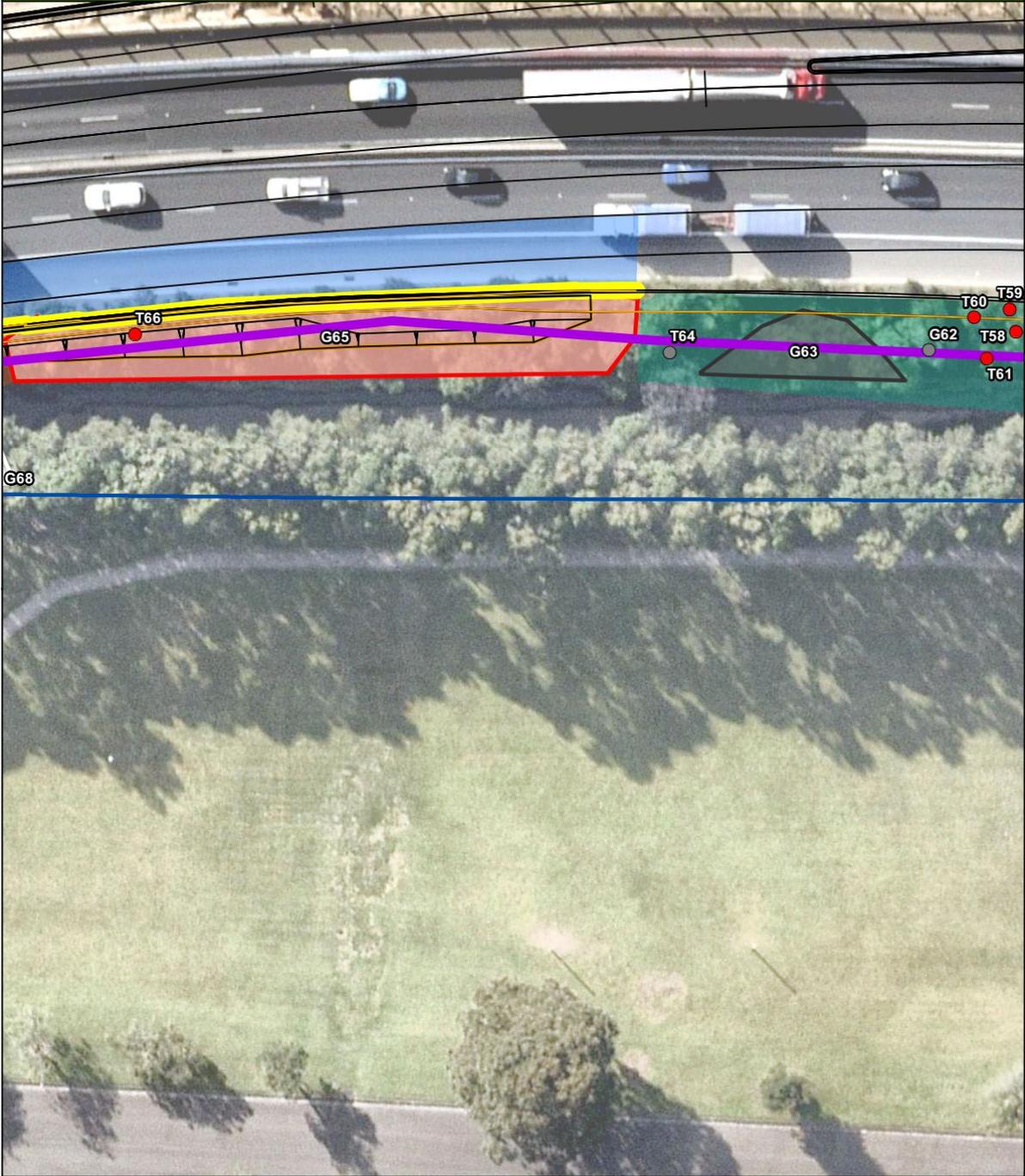
Tree Survey - South-west Kindalin, Kingsgrove Area 2



Legend		
● Inside Project Boundary, Remove	▭ Project Deed Boundary	
● Retain	▭ Noise Barrier	
● Non-Prescribed Tree	▭ Associated Batter Works	
— Surface Road Design	▭ New Bypass Extension	
— Construction Activities	▭ Required for Trenching Permanent ITS	
▬ ITS Secondary Cableway Trench		

0 5 10 20
 Metres
 Datum/Projection:
 GDA 1994 MGA Zone 56
 Prepared by: Date: 24/07/2017

Tree Survey - South-west Kindalin, Kingsgrove **Area 3**



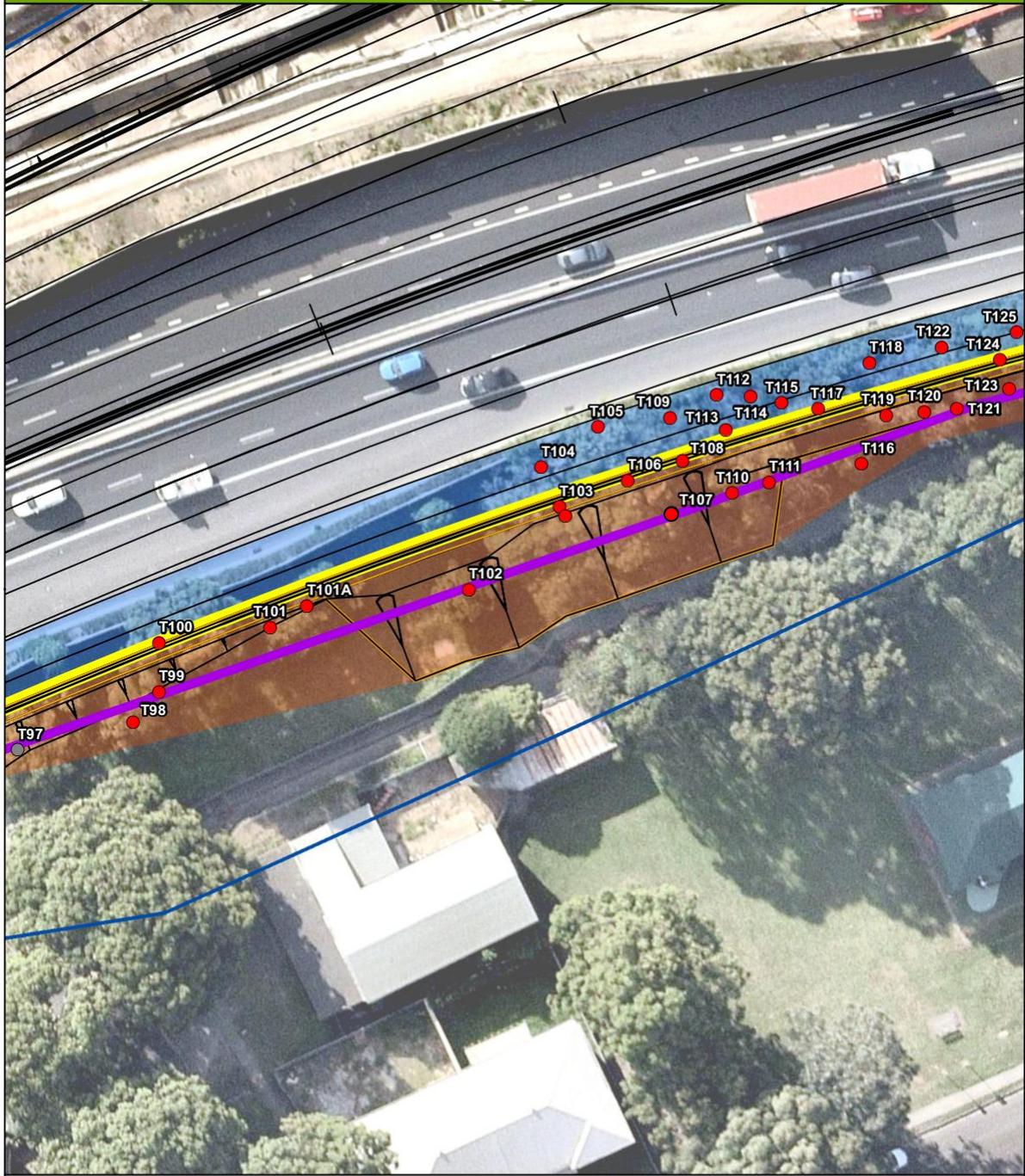
Legend			
<ul style="list-style-type: none"> ● Inside Project Boundary, Remove ● Retain ● Non-Prescribed Tree — Surface Road Design — Construction Activities — ITS Secondary Cableway Trench 	<ul style="list-style-type: none"> Project Deed Boundary Noise Barrier Associated Batter Works New Bypass Extension Required for Trenching Permanent ITS 		

Tree Survey - South-west Kindalin, Kingsgrove **Area 4**



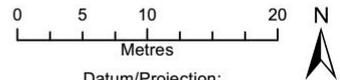
Legend		0 5 10 20 Metres	N ↑
● Inside Project Boundary, Remove	□ Project Deed Boundary	Datum/Projection: GDA 1994 MGA Zone 56	
● Retain	■ Noise Barrier	Prepared by:	Date: 24/07/2017
● Non-Prescribed Tree	■ Associated Batter Works		
— Surface Road Design	■ New Bypass Extension		
— Construction Activities	■ Required for Trenching Permanent ITS		
— ITS Secondary Cableway Trench			

Tree Survey - South-west Kindalin, Kingsgrove **Area 6**



Legend

- | | |
|-----------------------------------|--|
| ● Inside Project Boundary, Remove | ▭ Project Deed Boundary |
| ● Retain | ▭ Noise Barrier |
| ● Non-Prescribed Tree | ▭ Associated Batter Works |
| — Surface Road Design | ▭ New Bypass Extension |
| — Construction Activities | ▭ Required for Trenching Permanent ITS |
| — ITS Secondary Cableway Trench | |



Datum/Projection:
GDA 1994 MGA Zone 56

Prepared by: Date: 24/07/2017

7.7 Appendix G - Schedule of Assessed Trees
South/West Kindalin Underpass, Beverly Hills.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
1	<i>Eucalyptus microcorys</i> Tallowwood	18	14	750	M	G	F	Introduced native species. Twiggy deadwood present, multiple stems @ 3m AGL. Included, squeezing stems noted. High percentage of maturing epicormic growth, suspect recovery growth from previous drought.	2D	M	M	3.0	9.0	255
2	<i>Eucalyptus microcorys</i> Tallowwood	20	22	1050	M	G	F	Introduced native species. Deadwood up to 20mm in diameter, co-dominate @ 4m AGL with squeezing stems. High percentage of epicormic growth.	1A	M	H	3.4	12.6	499
3	<i>Melaleuca quinquenervia</i> Broad Leaved Paperbark	14	8	725 @ 1m AGL	M	G	G-F	Locally indigenous species. Twiggy deadwood, torn limbs over pathway. Minor epicormic growth, trifurcate @ 1.1m AGL. Low limbs over pathway and obvious shallow roots in bitumen path.	1A	M	H	2.9	8.8	241
4	<i>Eucalyptus microcorys</i> Tallowwood	18	11	700	M	G	G-F	Introduced native species. Deadwood to 40mm in diameter, canopy thinning. Trifurcate @ 4.5m AGL. Low branch overhanging pathway.	2D	M	M	2.9	8.4	222
5	<i>Eucalyptus sp.</i>	8	6	225	Y	G	F	Native specimen. 45° lean to south east.	3D	M	M	1.8	2.7	23
G6	<i>Casuarina glauca</i> x 25 <i>Eucalyptus sp.</i> X 4	6-10	-	150- 250 **250	Y-SM	G	G	Locally indigenous species. Group of trees planted in a straight line along fence of creek, branches do not extend to other side of creek.	2B	M	M	1.9	3.0	28
7	<i>Casuarina glauca</i> Swamp She-Oak	7	10	250	SM	G	F	Locally indigenous species. Broken branches @ base of tree, no other special problems noted at time of assessment. Storm-water pit to south .2m from stem, Wall to north.	2B	M	M	1.9	3.0	28

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
8	<i>Casuarina glauca</i> Swamp She-Oak	8	10	375	SM	G	G-F	Locally indigenous species. Trifurcate @ 1.2m AGL. Included stems with no reaction wood noted, prolific fruiting at time of assessment. 1.2m from wall.	2D	M	M	2.2	4.5	64
9	<i>Acmena</i> sp. Lilly Pilly	3.2	4	80 (100)	Y	G	G	Native specimen. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7
10	<i>Acacia longifolia</i> subsp. <i>longifolia</i> Golden Wattle	6	14	300	M	P-F	P	Locally indigenous species. Large broken limb, equates to half of the canopy.	4A	L	L	2.0	3.6	41
G11	<i>Cotoneaster</i> sp. <i>Ligustrum lucidum</i> Broad leaf Privet	-	-	-	-	-	-	Introduced exotic species. Noxious weed species (&/or under 3m). Not classed as 'a tree' under DPE approval/conditions.	4E	L	L	-	-	-
12	<i>Eucalyptus</i> sp.	9	4	175	Y	G	G	Native specimen. No special problems noted at assessment. Canopy entwined with Privet.	2A	M	M	1.6	2.2	15
13	<i>Eucalyptus robusta</i> Swamp Mahogany	6.5	4	100	Y	G	G	Introduced native species. No special problems noted at assessment.	2A	M	M	1.5	2.0	7
14	<i>Eucalyptus robusta</i> Swamp Mahogany	10	9	200	SM	G	F	Introduced native species. Thin canopy and epicormic growth noted. Minor deadwood.	2D	M	M	1.7	2.4	18
15	<i>Casuarina cunninghamiana</i> River She-Oak	10	7	225	SM	G	F	Locally indigenous species. Thin canopy.	2A	M	M	1.8	2.7	23
16	<i>Casuarina cunninghamiana</i> River She-Oak	12	10	200	SM	G	F	Locally indigenous species. Vine noted up stems, Co-dominate @ 2m AGL and included stems.	2D	M	M	1.7	2.4	18
17	<i>Casuarina cunninghamiana</i> River She-Oak	12	10	200	SM	G	F	Locally indigenous species. Multiple stems noted @ 3m AGL.	2D	M	M	1.7	2.4	18
G18	<i>Ligustrum</i> sp.	-	-	-	SM	-	-	Introduced exotic species. Not classed as 'a tree' under DPE approval/conditions.	4E	L	L	-	-	-

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
19	<i>Eucalyptus robusta</i> Swamp Mahogany	6	8	125	SM	F	P	Introduced native species. 100% epicormic growth, possibly damaged in previous storm	3D	M	M	1.5	2.0	8
20	<i>Casuarina cunninghamiana</i> River She-Oak	6.5	3	60 (100)	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7
21	<i>Casuarina glauca</i> Swamp She-Oak	9	8	125	SM	G	G	Locally indigenous species. Located hard against barrier wall of existing M5. No special problems noted at time of assessment.	3B	M	M	1.5	2.0	8
22	<i>Casuarina glauca</i> Swamp She-Oak	8.5	6	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	10
23	<i>Eucalyptus robusta</i> Swamp Mahogany	7	7	125	SM	G	F	Introduced native species. Immature epicormic growth noted, fair percentage of deadwood present, thin canopy.	2D	M	M	1.5	2.0	8
24	<i>Eucalyptus sp.</i> Gum	9	6	150	SM	G	F	Native specimen. Several areas of wounding on stem, suspect bacterial infection.	3D	M	M	1.5	2.0	10
25	<i>Casuarina glauca</i> Swamp She-Oak	10	9	225	SM	G	F	Locally indigenous species. Trifurcate @ 4.5m AGL, suspected storm damage related.	2D	M	M	1.8	2.7	23
G26	<i>Casuarina glauca</i> x 14 Swamp She-Oak <i>Eucalyptus tereticornis</i> x 14 Forest Red Gum <i>Eucalyptus robusta</i> x 3 Swamp Mahogany <i>Eucalyptus sp.</i> X 6 (1 x dead) Gum <i>Eucalyptus punctata</i> x 1 Grey Gum	Av. 9	** 14	** 350	Av. SM	Av. G	Av. G	Locally indigenous/introduced native species. See Appendix J for full break down of tree details for this group. Trees obviously planted given reasonably straight lines. Located on border of Tallawarra Reserve and Woolli Creek. All similar age. A couple of trees lean heavily over proposed work site and may require removal/extensive pruning for access.	1B	H	H	2.2	4.2	55
27	<i>Casuarina glauca</i> Swamp She-Oak	9	5	150	SM	G	G	Locally indigenous species. Lean to north-east, branches held high.	2A	M	M	1.5	2.0	10

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
28	<i>Acacia</i> sp. Wattle	4.5	3	45 (100)	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	3A	M	M	1.5	2.0	7
29	<i>Eucalyptus robusta</i> Swamp Mahogany	6	5	125	Y	G	G	Introduced native species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	8
30	<i>Eucalyptus robusta</i> Swamp Mahogany	9	8	200	SM	G	G	Introduced native species. No special problems noted at time of assessment.	2A	M	M	1.7	2.4	18
31	<i>Casuarina glauca</i> Swamp She-Oak	10	10	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.7	2.4	18
32	<i>Casuarina glauca</i> Swamp She-Oak	12	10	175	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.6	2.2	15
33	<i>Casuarina glauca</i> Swamp She-Oak	7	4	125	Y	G	F	Locally indigenous species. Minor epicormic growth noted. Canopy orientated to north-east.	2D	M	M	1.5	2.0	8
34	<i>Casuarina glauca</i> Swamp She-Oak	6	4	175	Y	G	F	Locally indigenous species. Suppressed specimen with poor form.	2D	M	M	1.6	2.2	15
35	<i>Acacia</i> sp. Wattle	7	8	175	SM	G	F	Native specimen. No special problems noted at time of assessment.	3A	M	M	1.6	2.2	15
36	<i>Eucalyptus robusta</i> Swamp Mahogany	9	8	250	SM	G	P	Introduced native species. Wounding at base, borer damaged noted. Prolific epicormic growth.	2A	M	M	1.9	3.0	28
37	<i>Casuarina glauca</i> Swamp She-Oak	7	8	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	10
38	<i>Casuarina glauca</i> Swamp She-Oak	10	6	100	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
G39A	<i>Eucalyptus tereticornis</i> x 6 Forest Red Gum	Av. 13	** 12	** 300	Av. SM	Av. G	Av. G	Mainly locally indigenous species. Several trees lean heavily over proposed work site and may require removal/extensive pruning for access. See Appendix J for full tree details.	1B	H	H	2.0	3.6	41
	<i>Casuarina glauca</i> x 14 Swamp She-Oak													
	<i>Eucalyptus</i> sp. X 2 Gum													
	<i>Eucalyptus robusta</i> x 10 Swamp Mahogany													
	<i>Acacia</i> sp. X 1 Wattle													
39	<i>Casuarina glauca</i> Swamp She-Oak	8	4	100	SM	G	G	Locally indigenous species, branches extend over M5.	2D	M	M	1.5	2.0	7
40	<i>Eucalyptus robusta</i> Swamp Mahogany	7	6	225	SM	F	F	Introduced native species. High percentage of epicormic growth. Suppressed specimen, secondary leader low to the east.	3D	M	M	1.8	2.7	23
41	<i>Casuarina cunninghamiana</i> River She-Oak	6.5	4	100	SM	G	F	Locally indigenous species. Suppressed specimen, canopy all orientated to the north.	2D	M	M	1.5	2.0	7
42	<i>Casuarina cunninghamiana</i> River She-Oak	6	4	75 (100)	SM	G	F	Locally indigenous species. Suppressed specimen, canopy all orientated to the north.	2D	M	M	1.5	2.0	7
43	<i>Eucalyptus robusta</i> Swamp Mahogany	8.5	5	250	SM	G	F	Introduced native species. Mainly epicormic growth.	2D	M	M	1.9	3.0	28
44	<i>Acacia</i> sp. Wattle	8	5	175	SM	G	G	Native specimen. Twiggy deadwood present, branches extend over M5.	3A	M	M	1.6	2.2	15
45	<i>Casuarina glauca</i> Swamp She-Oak	9	4	150	SM	G	G	Locally indigenous species. Hanger in canopy, no special problems noted at time of assessment.	2A	M	M	1.5	2.0	10
46	<i>Casuarina glauca</i> Swamp She-Oak	7	4	100	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
47	<i>Acacia</i> sp. Wattle	6	3	50 (100)	Y	G	G	Native specimen. No special problems noted at time of assessment.	3A	M	M	1.5	2.0	7
48	<i>Eucalyptus robusta</i> Swamp Mahogany	9	5	225	SM	G	G	Introduced native species. No special problems noted at time of assessment.	2A	M	M	1.8	2.7	23
49	<i>Acacia</i> sp. Wattle	6	3	50 (100)	Y	G	G	Native specimen. No special problems noted at time of assessment.	3A	M	M	1.5	2.0	7
50	<i>Acacia</i> sp. Wattle	6	4	75 (100)	Y	G	F	Native specimen. No special problems noted at time of assessment.	3A	M	M	1.5	2.0	7
51	<i>Casuarina glauca</i> Swamp She-Oak	7	4	125	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	8
52	<i>Eucalyptus robusta</i> Swamp Mahogany	7.5	6	100	Y-SM	G	G	Introduced native species. High percentage of epicormic growth.	2D	M	M	1.5	2.0	7
53	<i>Casuarina glauca</i> Swamp She-Oak	10	6.5	200	SM	G	G	Locally indigenous species. Overgrown with vine.	2D	M	M	1.7	2.4	18
54	<i>Eucalyptus robusta</i> Swamp Mahogany	9	6	250	SM	G	G	Introduced native species. High percentage of epicormic growth. Branch overhangs M5.	2D	M	M	1.9	3.0	28
55	<i>Casuarina cunninghamiana</i> River She-Oak	12	7	225	SM	G	P	Locally indigenous species. Large tear out wound on northern side of stem, deep into cambium @ 3.5m AGL.	3D	M	M	1.8	2.7	23
56	<i>Casuarina cunninghamiana</i> River She-Oak	7	5	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Branch overhangs M5.	2D	M	M	1.5	2.0	10
57	<i>Casuarina cunninghamiana</i> River She-Oak	11	7	250	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Branch overhangs M5.	2D	M	M	1.9	3.0	28
58	<i>Casuarina cunninghamiana</i> River She-Oak	11	7	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment; however vine is growing up stem.	2A	M	M	1.7	2.4	18

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
59	<i>Casuarina cunninghamiana</i> River She-Oak	11	7	225	SM	G	F	Locally indigenous species. Secondary stem @0.1m AGL, stem union is included.	2D	M	M	1.8	2.7	23
60	<i>Acacia</i> sp. Wattle	6	5	100	SM	G	G	Native specimen. Tree has lean to south.	3A	M	M	1.5	2.0	7
61	<i>Casuarina glauca</i> Swamp She-Oak	9	5	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Branch tips overhang M5.	2D	M	M	1.5	2.0	10
G62	<i>Acacia</i> sp. - Dead Wattle <i>Lantana camara</i> Lantana <i>Ligustrum lucidum</i> Large Leaved Privet <i>Ligustrum sinense</i> Chinese Privet	-	-	-	-	-	-	Impenetrable, noxious weed species. Not classed as 'a tree' under DPE approval/conditions. Dead Wattles. Smaller <i>Casuarina</i> sp. and <i>Cestrum nocturnum</i> (weed species) 3m & under, were noted amongst weeds.	4A	L	L	-	-	-
G63	<i>Acacia</i> sp. Wattle <i>Lantana camara</i> Lantana	-	-	-	-	-	-	Most Wattles are dead/partially dead with just one live limb. Borer attack evident. Not classed as 'a tree' under DPE approval/conditions.	4A	L	L	-	-	-
64	<i>Acacia</i> sp. - DEAD Wattle	12	14	-	M	P	P	Large dead Wattle. Not classed as 'a tree' under DPE approval/conditions.	4A	L	L	-	-	-
G65	<i>Acacia</i> sp. Wattle Weed species	3-7	4-8	Av. 200	SM	G	G-F	Group of Wattle intermingled with a larger number of Large Leaved and Chinese Privet. <i>Cestrum nocturnum</i> and <i>Lantana camara</i> also noted.	4E	L	L	1.7	2.4	18
66	<i>Casuarina glauca</i> Swamp She-Oak	9	6	250	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Located hard against M5 barrier wall.	2B	M	M	1.9	3.0	28

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
G67	<i>Acacia</i> sp. Wattle	up to 9	up to 6	Up to 200	SM	G-F	G-F	Native specimens. Unmaintained area, fairly steep embankment. Appear planted. Heavy understorey of weed species.	2A	M	M	1.7	2.4	18
	<i>Eucalyptus robusta</i> Swamp Mahogany													
	<i>Pittosporum undulatum</i> Sweet Pittosporum													
G68	<i>Eucalyptus tereticornis</i> Forest Red Gum	7-14	4-8	** 350	SM	G	G-F	Maintained area on edge of Tallawarra Reserve. Trees planted in defined rows, and area mulched. Very similar condition and planting to Group 26 & 39A- See Appendix J. Several trees lean to north (toward proposed works) and may be affected by proposed works.	1B	H	H	2.2	4.2	55
	<i>Casuarina glauca</i> Swamp She-Oak													
	<i>Eucalyptus pilularis</i> Blackbutt													
	<i>Eucalyptus robusta</i> Swamp Mahogany													
69	<i>Casuarina cunninghamiana</i> River She-Oak	11	10	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Vine growing up lower branches.	2A	M	M	1.7	2.4	18
70	<i>Casuarina cunninghamiana</i> River She-Oak	10	10	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	10
71	<i>Casuarina cunninghamiana</i> River She-Oak	7	5	50 (100)	Y-SM	G	G	Locally indigenous species. Suppressed specimen, upper crown has lean to north.	2D	M	M	1.5	2.0	7
72	<i>Acacia</i> sp. Wattle	11	10	350	M	P	P	Borer evident, mainly epicormic growth, in significant decline. 3 x dead Wattle beside tree.	4A	L	L	2.2	4.2	55
73	<i>Casuarina cunninghamiana</i> River She-Oak	8	4	75 (100)	Y	G	G	Locally indigenous species. Co-dominate at 5.5m AGL> Rubbing on branches of T72.	2D	M	M	1.5	2.0	7
74	<i>Casuarina cunninghamiana</i> River She-Oak	4.5	2	25 (100)	Y	G	P	Locally indigenous species. Tree has been lopped/severed, only lower live limbs remain.	4C	L	L	1.5	2.0	7

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
75	<i>Casuarina cunninghamiana</i> River She-Oak	11	8	100	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7
76	<i>Acacia</i> sp. Wattle	10	12	225	M	P	P	Native specimen. 95% epicormic growth. Borer activity noted, large percent of deadwood and die-back present.	4A	L	L	1.8	2.7	23
77	<i>Casuarina cunninghamiana</i> River She-Oak	8	6	100	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7
78	<i>Acacia</i> sp. Wattle	10?	11?	300	M	P	P	Native specimen. Specimen has failed, root ball out of ground (wind-throw). Leaning on current M5 barrier wall. Not classed as 'a tree' under DPE approval/conditions.	4B	L	L	2.0	3.6	41
79	<i>Casuarina cunninghamiana</i> River She-Oak	8	6	100	Y	G	G	Locally indigenous species. Suppressed specimen.	2D	M	M	1.5	2.0	7
80	<i>Acacia</i> sp. – DEAD Wattle	-	-	-	-	-	-	Native specimen. Dead. Not classed as 'a tree' under DPE approval/conditions.	4A	L	L	-	-	-
81	<i>Casuarina cunninghamiana</i> River She-Oak	8	10	125	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	8
82	<i>Casuarina cunninghamiana</i> River She-Oak	10	10	150	Y	G	G	Locally indigenous species. Canopy orientated to the north. Tree surrounded by Privet.	2A	M	M	1.5	2.0	10
83	<i>Casuarina cunninghamiana</i> River She-Oak	10	10	125	Y	G	G	Locally indigenous species. No special problems noted at time of assessment. Tree surrounded by Privet.	2A	M	M	1.5	2.0	8
84	<i>Casuarina cunninghamiana</i> River She-Oak	12	10	300	SM	G	G	Locally indigenous species. Tree surrounded by Privet. 'Dog-leg' in upper stem.	3D	M	M	2.0	3.6	41
85	<i>Casuarina cunninghamiana</i> River She-Oak	10	9	125	Y	G	G	Locally indigenous species. No special problems noted at time of assessment. Tree surrounded by Privet.	2A	M	M	1.5	2.0	8

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
86	<i>Casuarina cunninghamiana</i> River She-Oak	7	6	75 (100)	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7
87	<i>Casuarina cunninghamiana</i> River She-Oak	11	10	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Canopy orientated all to the north.	2A	M	M	1.5	2.0	10
88	<i>Casuarina cunninghamiana</i> River She-Oak	11	10	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Canopy orientated all to the north.	2A	M	M	1.7	2.4	18
89	<i>Acacia</i> sp. Wattle	10	12	175/ 225 (285)	M	P	P	Native specimen. 90% epicormic growth. Co-dominate stem, borer evident. Tree is significant decline.	4A	L	L	-	-	-
90	<i>Acacia</i> sp. - DEAD Wattle	-	-	-	-	-	-	Native specimen. Dead. Not classed as 'a tree' under DPE approval/conditions.	4A	L	L	-	-	-
91	<i>Casuarina cunninghamiana</i>	10	8	150	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	10
92	<i>Casuarina cunninghamiana</i> River She-Oak	10	8	75 (100)	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	7
93	<i>Casuarina cunninghamiana</i> River She-Oak	10	8	125	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.5	2.0	8
94	<i>Casuarina cunninghamiana</i> River She-Oak	10.5	8	175	Y-SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.6	2.2	15
95	<i>Casuarina cunninghamiana</i> River She-Oak	11	10	175	Y-SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.6	2.2	15
96	<i>Casuarina cunninghamiana</i> River She-Oak	11	10	225	Y-SM	G	G	Locally indigenous species. Branches extend over M5.	2A	M	M	1.8	2.7	23
97	<i>Erythrina crista-galli</i> Cockspur Coral Tree	6.5	12	400 / 200 (450)	M	G	G	Introduced exotic species. Noxious weed species. Not classed as 'a tree' under DPE approval/conditions.	4E	M	L	2.4	5.4	92

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
98	<i>Pittosporum undulatum</i> Sweet Pittosporum	5	5	150	SM	G	F	Locally indigenous species. Suppressed specimen, leans to west.	3C	M	M	1.5	2.0	10
99	<i>Acacia</i> sp. Wattle	5	10	300 AB	M	G	F	Native specimen. Large dead sections noted.	4A	L	L	2.0	3.6	41
100	<i>Eucalyptus microcorys</i> Tallowwood	14	12	550	SM	G	F	Introduced native species. Squeezing co-dominate stem @ 1m AGL. Branch located over M5. Located on edge of steep embankment.	3D	M	M	2.6	6.6	137
101	<i>Pittosporum undulatum</i> Sweet Pittosporum	7.5	10	200	M	G	G-F	Locally indigenous species. Specimen has large broken branch hanging in tree.	3C	M	M	1.7	2.4	18
101A	<i>Acacia</i> sp - clump	4	-	-	SM	F	F	Native specimens. No detailed assessment.	4A	L	L	-	-	-
102	<i>Ficus</i> sp. Fig	5	8	250	SM	G	F	Tip dieback noted. High percentage of epicormic growth.	2D	M	M	1.9	3.0	28
103	<i>Acacia</i> sp. X 2 Wattle	8	8	225 & 175	M	G	F-P	Tree closest to M5 barrier wall (225mm stem) has large, dying lower limb. Both lean to west.	4E	L	L	1.8	2.7	23
104	<i>Pittosporum undulatum</i> Sweet Pittosporum	5	5	150	M	G	F	Locally indigenous species. Located hard against M5 wall barrier.	3C	M	M	1.5	2.0	10
105	<i>Eucalyptus</i> sp.	8	7	175	SM	F	F-P	Native specimen. Canopy orientated to the north, thin, twiggy deadwood present.	2D	M	M	1.6	2.2	15
106	<i>Eucalyptus robusta</i> Swamp Mahogany	9	6	150	Y-SM	F	F	Introduced native species. Canopy all orientated to the north. Suppressed by T107.	2D	M	M	1.5	2	10
107	<i>Acacia</i> sp. Wattle	14	14	325	M	F-P	P	Native specimen. High presence of deadwood in canopy, borer damaged noted, inclusion noted in upper stem.	4A	L	L	2.1	3.9	48
108	<i>Casuarina cunninghamiana</i> River She-Oak	6	5	100	Y	G	G	Locally indigenous species. Slightly suppressed.	2A	M	M	1.5	2.0	7
109	<i>Eucalyptus robusta</i> Swamp Mahogany	10	6	250	SM	G	G	Introduced native species. 20% epicormic growth, branch overhangs the M5.	2D	M	M	1.9	3.0	28

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
110	<i>Eucalyptus robusta</i> Swamp Mahogany	11	8	225	SM	G	F	Introduced native species. High percentage of epicormic growth present. Poor form, canopy orientated to the east.	2D	M	M	1.8	2.7	23
111	<i>Casuarina glauca</i> Swamp She-Oak	10	7	225	SM	G	G	Locally indigenous species. Tree has lean to the east.	2A	M	M	1.8	2.7	23
112	<i>Eucalyptus robusta</i> Swamp Mahogany	11	7	225	SM	G	G	Introduced native species. Canopy all orientated to the north.	2A	M	M	1.8	2.7	23
113	<i>Casuarina glauca</i> Swamp She-Oak	12	7	275	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	2.0	3.3	35
114	<i>Casuarina glauca</i> Swamp She-Oak	8	6	175	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Privet growing between it and M5.	2A	M	M	1.6	2.2	15
115	<i>Casuarina glauca</i> Swamp She-Oak	14	6	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.7	2.4	18
116	<i>Melaleuca</i> sp.	6	5	150	M	G	F	Native specimen. Dead low branch.	2A	M	M	1.5	2	10
117	<i>Eucalyptus robusta</i> Swamp Mahogany	12	10	250	SM	G	G-F	Introduced native species. High percentage of epicormic growth present. No clear leader. 3 x large dead Wattle within close proximity.	3D	M	M	1.9	3.0	28
118	<i>Casuarina glauca</i> Swamp She-Oak	10	8	250	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.9	3.0	28
119	<i>Melaleuca</i> sp.	6.5	5	200	M	G	F	Native specimen. Twiggy deadwood present.	2A	M	M	1.7	2.4	18
120	<i>Eucalyptus robusta</i> Swamp Mahogany	6	6	100	Y-SM	G	F	Introduced native species. High percentage of epicormic growth present. Large dead Wattle in close proximity.	3D	M	M	1.5	2.0	7

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments	ULE	TSR	RV	SRZ (m)	TPZ (m)	TPZ (area)
121	<i>Eucalyptus robusta</i> Swamp Mahogany	6.5	4	75 (100)	Y	G	F	Introduced native species. High percentage of epicormic growth present.	3D	M	M	1.5	2	7
122	<i>Eucalyptus robusta</i> Swamp Mahogany	12	8	225	SM	F	F-P	Introduced native species. Tree stem has 'dog leg' @ 6m AGL. All canopy to the north.	3D	M	M	1.8	2.7	23
123	<i>Eucalyptus robusta</i> Swamp Mahogany	14?	7?	*250	SM	G	G-F	Introduced native species. Hard to assess – very steep embankment and dense with weedy undergrowth. Tree orientated to the north.	2D?	M	M	1.9	3.0	28
124	<i>Casuarina cunninghamiana</i> River She-Oak	6	4	100	Y-SM	G	G	Locally indigenous species. No special problems at time of assessment. Large dead Wattle beside this specimen.	2A	M	M	1.5	2	7
125	<i>Casuarina cunninghamiana</i> River She-Oak	11	8	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.7	2.4	18
126	<i>Casuarina cunninghamiana</i> River She-Oak	12	8	225	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.	2A	M	M	1.8	2.7	23

KEY



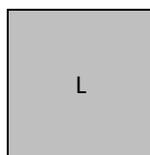
Tree to be retained.



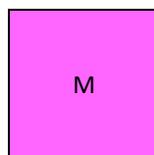
Not classed as 'a tree' under DPE conditions (see Part 1.3).



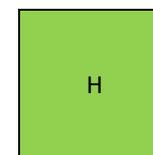
Tree proposed to be removed.



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.

* DBH 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.

7.8 Appendix H - Photographs



Photo 1 – Tree 5 noted with red arrow, leans heavily over proposed access.



Photo 2 – Group 6, trees are well protected by drain and fencing.



Photo 3 – Group 26 – Woollli Creek underground at this point, some trees lean over proposed work site.



Photo 4 – Group 67 – Mainly weed species with the occasional native planted specimen. Most large *Acacia* sp. have died.



Photo 5 – Group 68 – Defined rows indicate planted trees.



Photo 6 – Tree 97 – Noxious weed species Cockspur Coral Tree.

7.9 Appendix I - Tree Group 26 & 39A Details

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments
G26	<i>Casuarina glauca</i> Swamp She-Oak	12	6	125	SM	G	F	Locally indigenous species. Co-dominate @ 3m AGL.
G26	<i>Eucalyptus</i> sp. Gum	14	8	325	M	G	G	No special problems noted at time of assessment.
G26	<i>Casuarina glauca</i> Swamp She-Oak	11	8	225	SM	G	G	Locally indigenous species. Canopy orientated to north-east with slight lean.
G26	<i>Eucalyptus tereticornis</i> Forest Red Gum	8	8	100 / 125 (160)	Y	G	G	Locally indigenous species. Co-dominate from root crown. Clear stem until high in canopy
G26	<i>Casuarina glauca</i> Swamp She-Oak	9	14	225 @ 1m AGL	SM	F	P	Locally indigenous species. Has strong lean (more than 45 ⁰). Vine noted up stem. Located outside boundary but crown will require extensive pruning.
G26	<i>Eucalyptus</i> sp.	14	16	300	SM	G	G	No special problems noted at time of assessment.
G26	<i>Casuarina glauca</i> Swamp She-Oak	14	6	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G26	<i>Casuarina glauca</i> Swamp She-Oak	7	9	200 @ GL	SM	G	F-G	Locally indigenous species. Co-dominate @ .8m AGL. Low branches orientated to the north-east.
G26	<i>Eucalyptus robusta</i> Swamp Mahogany	12	7	225	SM	G	G	Locally indigenous species. Approximately 10% epicormic growth. Tree leans to north-east but self-corrected.
G26	<i>Eucalyptus tereticornis</i> Forest Red Gum	13	7	200	SM	G	G	Locally indigenous species. Canopy held high and orientated to south-west.
G26	<i>Eucalyptus robusta</i> Swamp Mahogany	16	10	350	M	G	G	Locally indigenous species. Minor lean to north-east.
G26	<i>Casuarina glauca</i> Swamp She-Oak	8	7	200	SM	G	G	Locally indigenous species. Minor lean to north-east. Dense canopy.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments
G26	<i>Eucalyptus</i> sp. – DEAD Gum	-	-	-	-	-	-	Dead
G26	<i>Eucalyptus</i> sp.	9	7	200	SM	G	G	Locally indigenous species. Re-growth after previous damage – suspect storm damage. Canopy orientated to south-west.
G26	<i>Eucalyptus</i> sp.	16	6	275	SM	G	G	Locally indigenous species. Canopy held high and symmetrical.
G26	<i>Casuarina glauca</i> Swamp She-Oak	9	7	225	SM	G	F	Locally indigenous species. Co-dominate and included @ 1.5m AGL. Canopy orientated to north-east.
G26	<i>Eucalyptus</i> sp.	7	2	100	Y	P	P	Tree subject to borer attack, very thin canopy noted. Copious deadwood present.
G26	<i>Casuarina glauca</i> Swamp She-Oak	11	7	200	SM	G	G	Locally indigenous species. No special problems at time of assessment.
G26	<i>Eucalyptus punctata?</i> Grey Gum	13	10	275	SM	G	F	Locally indigenous species? Poor form, 'dog-leg' in stem. Located right on edge of pathway.
G26	<i>Casuarina glauca</i> Swamp She-Oak	12	8	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G26	<i>Casuarina glauca</i> Swamp She-Oak	12	8	200 / 125 (235)	SM	G	G	Locally indigenous species. Co-dominate and included @ .4m AGL.
G26	<i>Eucalyptus robusta</i> Swamp Mahogany	8	4	100	SM	G	P	Locally indigenous species. Canopy orientated and tree leans to south-west. Suppressed specimen.
G26	<i>Eucalyptus tereticornis</i> Forest Red Gum	14	8	175	SM	G	F	Locally indigenous species. Several deep cracks up stem.
G26	<i>Casuarina glauca</i> Swamp She-Oak	12	8	100 / 150 (180)	SM	G	F	Locally indigenous species. Co-dominate @ .1m AGL. North-east stem extends high over boundary.
G26	<i>Casuarina glauca</i> Swamp She-Oak	14	6	175	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments
G26	<i>Casuarina glauca</i> Swamp She-Oak	14	8	175 / 175 (250)	SM	G	G	Locally indigenous species. Co-dominate @ .2m AGL, union appears sound.
G26	<i>Eucalyptus tereticornis</i> Forest Red Gum	14.5	8	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Canopy held high.
G26	<i>Casuarina glauca</i> Swamp She-Oak	8	7	75 / 80/ 40 (225)	SM	G	F-G	Locally indigenous species. Multi-stemmed @ GL. Suppressed specimen.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	14	8	250	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Located close to concrete block on site.
G39A	<i>Eucalyptus tereticornis</i> Forest Red Gum	13	7	175	SM	P	P	Locally indigenous species. Upper canopy has strong lean to South-west.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	13	7	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Eucalyptus sp.</i> Gum	14	8	275	SM	G	G	No special problems noted at time of assessment.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	9	4	100	Y	G	F	Locally indigenous species. Poor form.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	10	6	100	Y	G	F	Locally indigenous species. No special problems noted at time of assessment. Canopy orientated to north-east (over boundary).
G39A	<i>Casuarina glauca</i> Swamp She-Oak	12	10	250	SM	G	F	Locally indigenous species. Secondary stem @ 2.5m AGL, union sound. Main leader co-dominate @ 4.5m AGL, union included.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	9	4	125	Y	G	F	Locally indigenous species. High percentage of epicormic growth.
G39A	<i>Eucalyptus tereticornis</i> Forest Red Gum	12	7	225	SM	G	F	Locally indigenous species. Co-dominate @ 7m AGL with minor inclusion. Canopy held high & orientated to south-west.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments
G39A	<i>Casuarina glauca</i> Swamp She-Oak	7	4	90 (100)	Y	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	9	6	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	10	6	175	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	10	6	140 / 110 (175)	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	10	4	150	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Low broken branch noted.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	10	6	125	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Eucalyptus tereticornis</i> Forest Red Gum	14	8	225	SM	G	G-F	Locally indigenous species. Co-dominate stems @ 10m AGL with inclusion noted.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	7	4	125	Y	G	F	Locally indigenous species. Canopy orientated to south-west. Secondary stem @ 2m AGL with inclusion noted. Wound @ 1.4m, borer/decay. Suppressed specimen.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	8	3	90 (100)	Y	G	G	Locally indigenous species. High percentage of epicormic growth.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	11	4	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Eucalyptus tereticornis</i> Forest Red Gum	14	8	200	SM	G	F	Locally indigenous species. Wound noted on south-west side of stem at base. Suspect internal decay pocket.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	9	8	125	SM	G	G	Locally indigenous species. Slightly suppressed specimen. No other problems noted at time of assessment.

Tree No.	Genus & species Common Name	Ht (m)	Sp (m)	DBH (mm)	Age	V	C	Comments
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	15	8	300	SM	G	G	Locally indigenous species. No special problems noted at time of assessment. Canopy held high.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	11	10	175	SM	G	G	Locally indigenous species. Broken branches noted. No other problems noted at time of assessment.
G39A	<i>Eucalyptus</i> sp.	8	4	100	Y	G	G-F	High percentage of epicormic growth noted, tall, thin specimen.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	11	8	150	Y	G	G	Locally indigenous species. No special problems noted at time of assessment. Low branches noted.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	13	8	200	SM	G	G	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Eucalyptus tereticornis</i> Forest Red Gum	15	8	225	SM	G	F	Locally indigenous species. Cracks in stem noted.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	15	10	175	SM	G	F	Locally indigenous species. No special problems noted at time of assessment.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	11	4	150	Y	G	G	Locally indigenous species. Some epicormic growth noted.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	10	4	100	Y	G	G-F	Locally indigenous species. Co-dominate @ 3m AGL.
G39A	<i>Casuarina glauca</i> Swamp She-Oak	10	12	225	SM	G	G-F	Locally indigenous species. Secondary stems @ 3m AGL, stem deeply fluted.
G39A	<i>Eucalyptus robusta</i> Swamp Mahogany	14	6	225	SM	G	G	Locally indigenous species. Epicormic growth noted on lower stem, deadwood in crown.
G39A	<i>Eucalyptus tereticornis</i> Forest Red Gum	9	6	100	Y	G	F-P	Locally indigenous species. Poor form, 'dog-leg' in stem, prolific epicormic growth.
G39A	<i>Acacia</i> sp. Wattle	7	8	80 (100)	Y	G	F-P	Partially failed, strong lean to north-east (over proposed work site).

This page is intentionally blank