

Tree Removals and Plantings

Western Surface Works (Including the Cooks River/Castlereagh Ironbark Forest, planted trees within the existing M5 corridor and trees associated with access to C1 and C3)

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Document Approval

Rev.	Date	Prepared by	Reviewed by	Recommended by	Approved by	Remarks
00	28/07/16	ATC	CDS-JV			For approval
01	29/08/16	ATC	CDS-JV			
Signature:						

Tree Removals and Plantings



Purpose of Report

This report was prepared by Australian Tree Consultants for CDS-JV to address condition B63 of Infrastructure Approval SS6788. This report specifically addresses trees to be removed and retained within and on the periphery of the Western Surface Works and Kingsgrove Tunnelling sites. This report includes trees associated with:

- the Cooks River/Castlereagh Ironbark Forest at Kingsgrove;
- the existing M5 corridor (within the area bounded by noise walls); and
- access to tunnel sites C1 and c3

Subsequent reports are anticipated for the removal of trees associated with:

- Road Widening Works at St Peters; and
- Road access and road infrastructure south of the M5 Motorway Kingsgrove (west of Kindalin underpass)

The tree removal and planting report does not address replacement plantings. These will be addressed in subsequent reports. The scope of this report is limited to the trees outlined in this report.

Tree Removals and Plantings

The report has been prepared to address condition B63 of Infrastructure Approval SS6788. The condition reads as follows:

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:

- a) a visual tree assessment with inputs from the design, landscape architect, construction team;*
- b) consideration of all options to amend the SSI where a tree has been identified for removal, including realignment, relocation of services, redesign of or relocation of ancillary components (such as substations, fencing etc.) and reduction of standard offsets to underground services; and*
- c) measures to avoid the removal of trees or minimise damage to existing trees and is to ensure the health and stability of those trees to be protected. This includes details of any proposed canopy or root pruning, excavation works, site controls on waste disposal, vehicular access, storage of materials and protection of public utilities.*

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.

Tree Removals and Plantings



Design Team, Landscape Architect and Construction Team Inputs


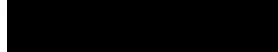
A review of the Western Surface Works associated with the scope of this report was carried out by the Independent Arborist (Australian Tree Consultants), Design Team and the Construction Team. The review focused on assessing both permanent and temporary design and construction requirements with the aim of minimising (as far as possible) tree removal at surface work locations, including along the periphery of the surface works sites.



The majority of trees assessed in this report are located within a section of vegetation identified as Cooks River / Castlereagh Ironbark forest, on the northern side of the M5 motorway at Kingsgrove and some planted trees between the noise walls and the trafficable lanes of the motorway. The area where these trees are located are subject to significant road widening works, including extending the existing 2 carriageway motorway, to a total of six carriageways, and realigning a shared path and open drainage channel.

The trees listed in the report were assessed based on the following design and construction considerations and analysis.

- Safety considerations including but not limited to:
 - Safe construction ingress and egress to the sites;
 - Safety in design for various temporary works requirements including the erection and removal of temporary perimeter fencing and noise barriers;
 - Safe design of permanent works
 - Safe operation of construction plant
 - Safety issues for perimeter interfaces including residences / businesses
- The amount of area required for storage of construction materials to effectively facilitate construction works.
- The special requirements of large plant and materials handling
- The effects of changes in temporary requirements to the permanent design
- Knock on affects in changing design to other temporary or permanent design components
- Impacts to changes in design, construction requirements and the approval requirements associated with those changes

Specific input and comments from the Design Manager, Landscape Architect (Urban Design Manager) and the Construction Team are given below.

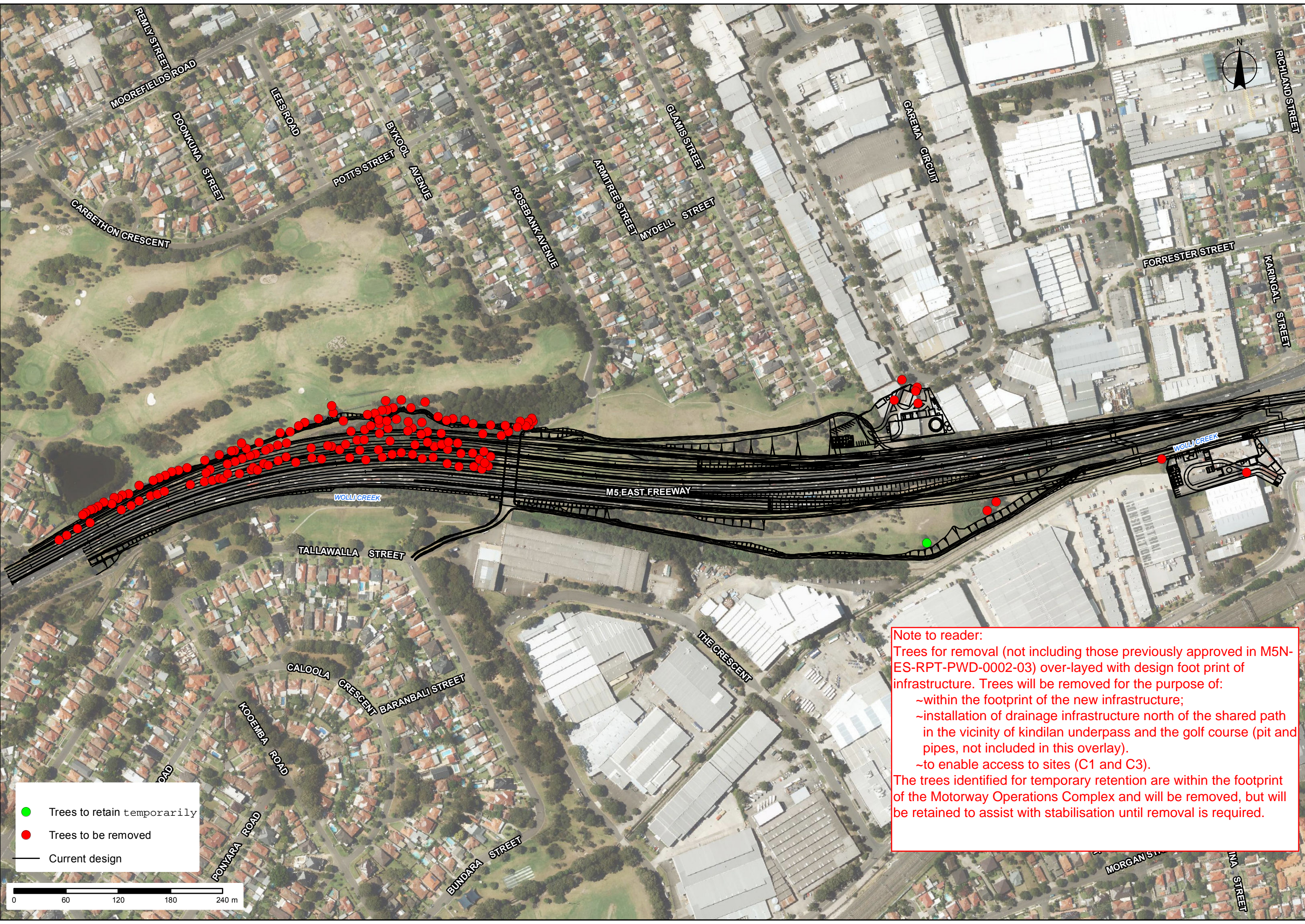
Design Manager	
Input / Review	There is little opportunity to preserve the trees identified for removal at the temporary and permanent works locations at the western surface worksite. This is due to the footprint required for the significant amount of additional permanent infrastructure. The work sites are constrained and the stringent design criteria, including safety in design considerations also limit further retention of trees. Construction teams attended with arborist to discuss space constraints as appropriate.
Signature	 – Design Manager 

Landscape Architect	
Input / Review	Based on the information provided, there is little opportunity to preserve the trees nominated, other than where already nominated. The final urban design and landscape plan will address the planting of trees, where feasible and reasonable, within the SSI boundary.
Signature	 – Landscape Architect, Urban Design Manager 

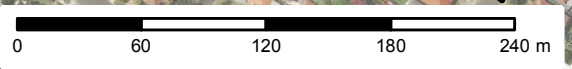
Tree Removals and Plantings



Construction Team	
Within the existing M5 noise walls	Trees between the existing M5 noise walls and the trafficable lanes of the M5 were identified for removal due to the road widening works required in this area (between Karingal Street, Kingsgrove and the existing truck bays). These trees were assessed by the arborist during a maintenance shutdown of the M5 in June 2016. The arborist was escorted by a member of the construction team (EV) who detailed the works and associated constraints in this area. A total of 245 trees were identified for removal in this area.
Western Surface Works	<p>Members of the construction team undertook an analysis of the design and construction requirements for the western surface works, in the area identified by the EIS as Cooks River / Castlereagh Ironbark Forest. Trees within this area were assessed by the arborists from 14 July 2016. Construction and design drawings were provided to the arborists and members of the construction team (NB, CG) attended site with the arborists to provide construction inputs. The area inspected also included the western extent of works north of the motorway (west of the forest and adjacent to the shared path and concrete drainage channel), areas at the current and proposed access locations to C1 and C3 and areas associated with the Motorway Operations Complex.</p> <p>This current survey included assessment of 2994 trees. Six trees have been identified for temporary retention as all remaining trees assessed are within the footprint of proposed built infrastructure (see attached drawing) or impacted by permanent drainage works. Six trees on the southern side of the motorway are proposed for temporary retention and will be retained at this stage of works. All six trees for temporary retention are within the footprint of the proposed Motorways Operations Complex and will be removed when required. Due to the installation of significant infrastructure at this site and constraints on the size of site and the approved site layout, 2988 trees at this site require removal at this time, and six further trees will be removed for the construction of the Motorways Operation Complex.</p>
Signature	<div style="display: flex; align-items: center;"> <div style="background-color: black; width: 100px; height: 20px; margin-right: 5px;"></div> – Project Manager, Western Surface Works <div style="margin-left: 100px; text-align: center;"> </div> </div>



- Trees to retain temporarily
- Trees to be removed
- Current design



Note to reader:
 Trees for removal (not including those previously approved in M5N-ES-RPT-PWD-0002-03) over-layed with design foot print of infrastructure. Trees will be removed for the purpose of:

- ~within the footprint of the new infrastructure;
- ~installation of drainage infrastructure north of the shared path in the vicinity of kindilan underpass and the golf course (pit and pipes, not included in this overlay).
- ~to enable access to sites (C1 and C3).

The trees identified for temporary retention are within the footprint of the Motorway Operations Complex and will be removed, but will be retained to assist with stabilisation until removal is required.



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26 August 2016

To [REDACTED]
Environment & Sustainability Manager
CDS-JV (New M5)

Re - Arboricultural Reports

I refer to your request to undertake site reviews of trees on the M5 Motorway (Part A) and WestConnex New M5 -Western Surface Works (Part B).

Site inspections occurred on the 21st June (Part A) and 14th July (Part B) 2016.

If you require any further information in relation to this report, please contact us on 0418 474 796.

Yours sincerely

Hugh Taylor
Director - Australian Tree Consultants
Director - Eagle Aerial Surveys (Drones)
Member Arboriculture Australia
BA (L) Major in Wilderness Management/Outdoor Education
Diploma Horticulture - Arboriculture (Level 5)
Arborist/ Tree Surgeon/ Horticulturist
Certificate IV Occupational Health & Safety
QTRA No 2650
NPWS Wildlife license and Wires volunteer
CASA RPAS Pilot and Operator

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PART A: WestConnex New M5 Extension

INTRODUCTION

This report was commissioned by CPB Dragados Samsung Joint Venture (CDSJV), in relation to the proposed widening of the WestConnex New M5 development project.

The purpose of this report is to:

- identify the trees within the site that are likely to be affected by the proposed works
- assess the current overall health and condition of the subject trees
- evaluate the anticipated impacts that the proposed development may have on the subject trees and assess their suitability for retention

The subject trees were inspected on 21st June 2016 from within the M5 East corridor with an escort from the CDS-JV construction team. 245 trees were identified within the proposed development footprint. Under the current proposal these trees cannot be successfully retained.

Further information, observations and measurements specific to each individual/group of trees can be found in Tree Data on page 5.

METHOD

A visual tree assessment (VTA) was undertaken following receipt of inputs from the design, landscape architect and construction team. Members of the CDS-JV team (EV) were present on site and provided further advice on inputs where required. The VTA was undertaken from ground level without the use of any invasive or diagnostic tools and testing.

No aerial inspections or root mapping was undertaken. Tree heights, canopy spread and diameter at breast height (DBH) was estimated, unless otherwise stated. The subject trees have not been assessed for ecological or environmental value.

Data and information was gathered and recorded using GNSS mapping and data collection equipment. The Site Map over page is not to scale (unless otherwise stated) and is to be used as a guide only.

SITE MAP for PART A: WestConnex New M5 Extension



TREE DATA for PART A: WestConnex New M5 Extension

All trees assessed for this part of the project are inside the current noise walls for the existing M5 from the existing truck bays to the area adjacent to Karingal Street, Kingsgrove. Typically, these trees form a single line directly between the traffic lanes and the noise wall on both sides of the motorway. There are a greater number of trees along the northern (eastbound) carriageway, than the southern carriageway in this area. All trees identified in this area require removal to enable the road to be widened in this area.

Tree No.	Scientific Name	Common Name	Trees in Group	Height	Canopy Spread	DBH	Health	Structure	Age	Comments	Easting	Northing	MSL
1	<i>Casuarina cunninghamiana</i>	River Oak	1	10-15	5-10	300	Good	Fair	Semi-mature	Northern side	323751.306	6242852.335	98.317
2	<i>Casuarina cunninghamiana</i>	River Oak	131	10-16	<5	150	Good	Fair	Semi-mature	Northern side	323883.059	6242857.326	28.219
3	<i>Casuarina cunninghamiana</i>	River Oak	1	10-17	<5	200	Good	Fair	Semi-mature	Northern side	324200.648	6242928.081	25.567
4	<i>Casuarina cunninghamiana</i>	River Oak	87	5-10	<5	150	Good	Fair	Semi-mature	Southside	324217.398	6242900.607	26.777
5	<i>Casuarina cunninghamiana</i>	River Oak	1	5-10	<5	150	Good	Fair	Semi-mature	Southside	324005.238	6242849.47	31.439
6	<i>Washingtonia filifera</i>	Cotton Palm	23	<5	<5	200	Good	Good	Semi-mature	Northern side cotton palms	324216.695	6242934.414	23.636
7	<i>Washingtonia filifera</i>	Cotton Palm	1	<5	<5	200	Good	Good	Semi-mature	Northern side cotton palms	324295.372	6242968.19	22.604

RECOMMENDATIONS

- All trees (245) require removal as they are within the footprint of the proposed road widening.
- All tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- All tree removal work is to be carried out in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).
- Mulch generated can be used off site at other WestConnex projects.

PART B: WestConnex New M5 (Western Surface Works)

INTRODUCTION

This report was commissioned by CPB Dragados Samsung Joint Venture (CDSJV), in relation to the proposed western surface works located at Kingsgrove, north of the existing motorway. The proposed works are part of the WestConnex New M5 development project.

The purpose of this report is to:

- identify the trees within the site that are likely to be affected by the proposed works
- assess the current overall health and condition of the subject trees
- evaluate the anticipated impacts that the proposed development may have on the subject trees and assess their suitability for retention

The proposed development will include:

- widening of the existing motorway
- drainage upgrade and relocation
- construction of pedestrian paths
- establishment of tunneling sites
- construction of a motorway operations complex

The subject trees were inspected on 14th July 2016. Members of the CDS-JV team (NB & CG) were present on site at the time to provide information as required. Of the 2,994 trees assessed 2,988 trees were identified within the proposed development footprint. Under the current proposal these trees cannot be successfully retained.

Six (6) trees have been assessed for temporary retention – Tree tag No. 156 (grouping of 6 *Acacia fimbriata* trees). Tree protection will be required in order to successfully retain these trees. However, it is noted that these trees are within the footprint of the Motorway Operations Complex and will require removal prior to construction of this complex. The trees may be retained until this time.

Further information, observations and measurements specific to each individual/group of trees can be found in Tree Data on page 12.

METHOD

A visual tree assessment (VTA) was undertaken following receipt of inputs from the design, landscape architect and construction team. Members of the CDS-JV team (NB & CG) were present on site and provided further advice on inputs where required. The VTA was undertaken from ground level without the use of any invasive or diagnostic tools and testing.

Trees within adjacent properties or restricted areas have been visually assessed without entering that property. As a result these trees were not subject to a complete visual inspection, therefore defects and abnormalities may be present but not recorded. Tree population has been estimated within dense areas of trees.

No aerial inspections or root mapping was undertaken. Tree heights, canopy spread and diameter at breast height (DBH) was estimated, unless otherwise stated.

Data and information was gathered and recorded using GNSS mapping and data collection equipment. Site Maps are not to scale (unless otherwise stated) and are to be used as a guide only.

Tree Retention Value

The significance of a tree or group of trees is determined using a combination of environmental, heritage/cultural and physical/social value. To promote a consistent approach to determining these values, guidelines, factors and selection criteria have been formulated into the Tree Retention Value and can be located in **Appendix A** at the end of this document.

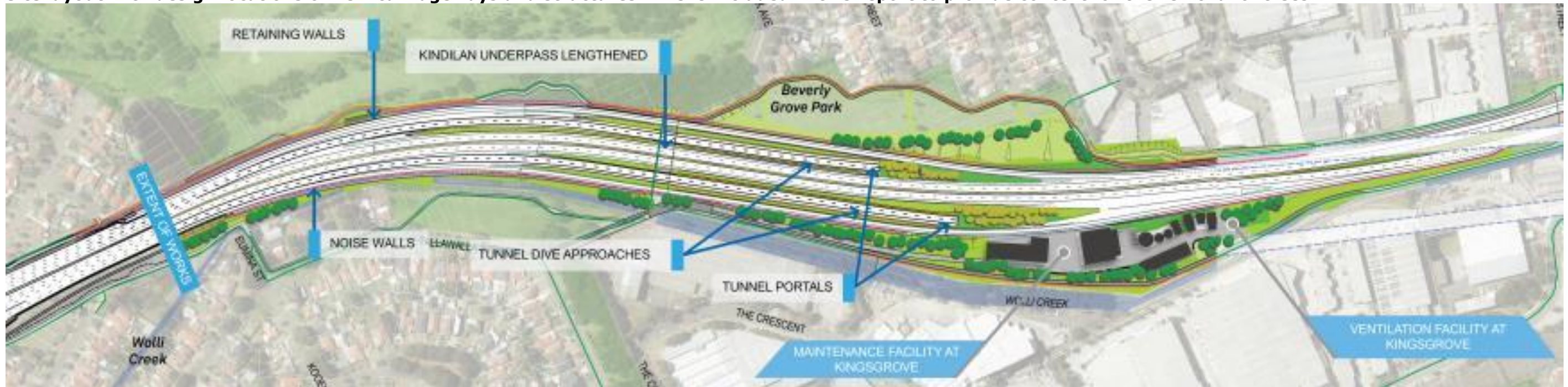
Documents and Plans Referenced

The recommendations of this report are based on the *Australian Standard, AS 4970-2009, Protection of Trees on Development Sites*, the findings from the site inspections and analysis of the following documents/plans:

- *WestConnex New M5 - Western Surface Works (power point presentation) 2016.*

SITE MAPS for PART B: WestConnex New M5 (Western Surface Works)

Site layout with design locations of new carriageways and structures. This is included in this report to provide context for the removal of trees.



Aerial photograph of identified Cooks River Ironbark forest with design overlay



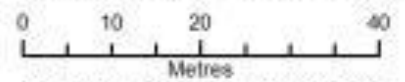
Legend

Subject Trees (Reason for removal)

- Motorway
- Pedestrian path and drainage



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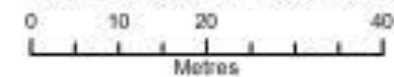
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Subject Trees (Reason for removal)

- Motorway
- Pedestrian path and drainage
- Drainage relocation



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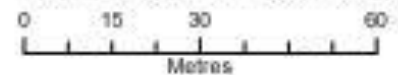
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Subject Trees (Reason for removal)

- Motorways operation complex
- Site access
- Tunnelling site



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TREE DATA for- PART B: WestConnex New M5 (Western Surface Works)

No	Botanical name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	TPZ (mm)	SRZ (mm)	Trees per group	Retention value	Outcome	Reason
1	<i>Melaleuca nodosa</i>	8	4	200	Good	Moderate	2.4	1.7	10	Medium	Remove	Pedestrian path & drainage
2	<i>Melaleuca nodosa</i>	9	3	150	Good	Moderate	2	1.5	15	Medium	Remove	Pedestrian path & drainage
3	<i>Acacia parramattensis</i>	6	3	200	Moderate	Moderate	2.4	1.7	7	Low	Remove	Pedestrian path & drainage
4	<i>Melaleuca nodosa</i>	12	5	300	Good	Moderate	3.6	2	4	Medium	Remove	Pedestrian path & drainage
5	<i>Melaleuca nodosa</i>	8	3	200	Good	Moderate	2.4	1.7	20	Medium	Remove	Pedestrian path & drainage
6	<i>Melaleuca nodosa</i>	7	3	250	Good	Moderate	3	1.9	8	Medium	Remove	Pedestrian path & drainage
7	<i>Melaleuca nodosa</i>	9	4	250	Good	Moderate	3	1.9	10	Medium	Remove	Motorway
8	<i>Acacia parramattensis</i>	8	2	150	Moderate	Poor	2	1.5	45	Low	Remove	Motorway
9	<i>Acacia parramattensis</i>	9	3	150	Moderate	Moderate	2	1.5	12	Low	Remove	Motorway
10	<i>Melaleuca nodosa</i>	9	4	200	Good	Moderate	2.4	1.7	55	Medium	Remove	Motorway
11	<i>Melaleuca nodosa</i>	10	4	200	Good	Moderate	2.4	1.7	45	Medium	Remove	Motorway
12	<i>Melaleuca nodosa</i>	9	3	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
13	<i>Melaleuca nodosa</i>	9	4	200	Good	Moderate	2.4	1.7	55	Medium	Remove	Motorway
14	<i>Acacia parramattensis</i>	8	2	150	Moderate	Poor	2	1.5	60	Low	Remove	Pedestrian path & drainage
15	<i>Acacia parramattensis</i>	9	3	150	Moderate	Poor	2	1.5	20	Low	Remove	Pedestrian path & drainage
16	<i>Casuarina cunninghamiana</i>	13	6	350	Moderate	Moderate	4.2	2.1	6	Low	Remove	Pedestrian path & drainage
17	<i>Melaleuca nodosa</i>	9	3	200	Good	Moderate	2.4	1.7	6	Medium	Remove	Pedestrian path & drainage
18	<i>Casuarina glauca</i>	15	8	300	Good	Moderate	3.6	2	6	Medium	Remove	Pedestrian path & drainage
19	<i>Melaleuca nodosa</i>	8	3	200	Moderate	Moderate	2.4	1.7	9	Low	Remove	Pedestrian path & drainage
20	<i>Casuarina glauca</i>	14	8	350	Good	Moderate	4.2	2.1	4	Medium	Remove	Pedestrian path & drainage
21	<i>Casuarina glauca</i>	15	8	400	Good	Moderate	4.8	2.3	3	Medium	Remove	Pedestrian path & drainage
22	<i>Casuarina glauca</i>	16	4	250	Good	Moderate	3	1.9	10	Medium	Remove	Pedestrian path & drainage
23	<i>Casuarina glauca</i>	15	7	350	Good	Moderate	4.2	2.1	9	Medium	Remove	Pedestrian path & drainage
24	<i>Casuarina glauca</i>	16	4	200	Good	Moderate	2.4	1.7	11	Medium	Remove	Pedestrian path & drainage
25	<i>Casuarina glauca</i>	6	1	150	Good	Moderate	2	1.5	7	Medium	Remove	Pedestrian path & drainage
26	<i>Casuarina glauca</i>	14	9	350	Moderate	Poor	4.2	2.1	1	Low	Remove	Pedestrian path & drainage
27	<i>Syncarpia glomulifera</i>	4	2	150	Good	Moderate	2	1.5	1	Medium	Remove	Pedestrian path & drainage
28	<i>Pinus radiata</i>	12	14	450	Good	Good	5.4	2.4	1	Medium	Remove	Pedestrian path & drainage
29	<i>Pinus radiata</i>	8	8	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
30	<i>Casuarina glauca</i>	16	10	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Pedestrian path & drainage
31	<i>Casuarina glauca</i>	15	10	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
32	<i>Casuarina glauca</i>	10	9	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
33	<i>Melaleuca quinquenervia</i>	8	8	300	Good	Good	3.6	2	1	Medium	Remove	Pedestrian path & drainage
34	<i>Melaleuca styphelioides</i>	5	2	150	Good	Good	2	1.5	6	Medium	Remove	Pedestrian path & drainage
35	<i>Casuarina glauca</i>	10	8	300	Good	Moderate	3.6	2	3	Medium	Remove	Pedestrian path & drainage
36	<i>Melaleuca styphelioides</i>	6	2	150	Good	Good	2	1.5	7	Medium	Remove	Pedestrian path & drainage

No	Botanical name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	TPZ (mm)	SRZ (mm)	Trees per group	Retention value	Outcome	Reason
37	<i>Casuarina glauca</i>	14	4	200	Good	Moderate	2.4	1.7	2	Medium	Remove	Pedestrian path & drainage
38	<i>Melaleuca styphelioides</i>	7	3	150	Good	Good	2	1.5	8	Medium	Remove	Pedestrian path & drainage
39	<i>Melaleuca quinquenervia</i>	12	9	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Pedestrian path & drainage
40	<i>Melaleuca styphelioides</i>	7	3	150	Good	Good	2	1.5	10	Medium	Remove	Pedestrian path & drainage
41	<i>Melaleuca styphelioides</i>	7	3	150	Good	Good	2	1.5	7	Medium	Remove	Pedestrian path & drainage
42	<i>Melaleuca quinquenervia</i>	12	9	400	Good	Moderate	4.8	2.3	1	Medium	Remove	Pedestrian path & drainage
43	<i>Melaleuca quinquenervia</i>	9	7	350	Good	Good	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
44	<i>Melaleuca styphelioides</i>	7	3	150	Good	Good	2	1.5	10	Medium	Remove	Pedestrian path & drainage
45	<i>Casuarina glauca</i>	15	10	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
46	<i>Melaleuca quinquenervia</i>	8	6	350	Good	Good	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
47	<i>Melaleuca styphelioides</i>	7	3	150	Good	Good	2	1.5	6	Medium	Remove	Pedestrian path & drainage
48	<i>Casuarina cunninghamiana</i>	16	8	350	Good	Good	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
49	<i>Casuarina cunninghamiana</i>	13	9	350	Good	Moderate	4.2	2.1	2	Medium	Remove	Pedestrian path & drainage
50	<i>Melaleuca styphelioides</i>	12	7	300	Good	Moderate	3.6	2	17	Medium	Remove	Pedestrian path & drainage
51	<i>Melaleuca quinquenervia</i>	14	8	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Pedestrian path & drainage
52	<i>Melaleuca styphelioides</i>	7	3	200	Good	Good	2.4	1.7	5	Medium	Remove	Pedestrian path & drainage
53	<i>Casuarina glauca</i>	14	9	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Drainage relocation
54	<i>Casuarina glauca</i>	16	9	400	Good	Moderate	4.8	2.3	1	Medium	Remove	Drainage relocation
55	<i>Casuarina glauca</i>	15	8	400	Good	Moderate	4.8	2.3	1	Medium	Remove	Drainage relocation
56	<i>Casuarina glauca</i>	16	8	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Drainage relocation
57	<i>Casuarina glauca</i>	16	9	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Drainage relocation
58	<i>Casuarina glauca</i>	16	10	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Drainage relocation
59	<i>Casuarina glauca</i>	17	9	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Drainage relocation
60	<i>Syncarpia glomulifera</i>	12	4	200	Good	Moderate	2.4	1.7	4	Medium	Remove	Drainage relocation
61	<i>Angophora floribunda</i>	18	9	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Drainage relocation
62	<i>Melaleuca styphelioides</i>	7	2	150	Good	Moderate	2	1.5	7	Medium	Remove	Drainage relocation
63	<i>Eucalyptus moluccana</i>	18	12	500	Good	Moderate	6	2.5	1	Medium	Remove	Drainage relocation
64	<i>Casuarina glauca</i>	12	4	200	Good	Moderate	2.4	1.7	1	Medium	Remove	Drainage relocation
65	<i>Eucalyptus moluccana</i>	17	9	400	Good	Good	4.8	2.3	1	Medium	Remove	Drainage relocation
66	<i>Melaleuca styphelioides</i>	8	2	150	Good	Moderate	2	1.5	8	Medium	Remove	Drainage relocation
67	<i>Angophora floribunda</i>	12	8	300	Good	Moderate	3.6	2	1	Medium	Remove	Drainage relocation
68	<i>Melaleuca styphelioides</i>	6	2	150	Good	Good	2	1.5	2	Medium	Remove	Drainage relocation
69	<i>Angophora floribunda</i>	12	8	300	Good	Moderate	3.6	2	1	Medium	Remove	Drainage relocation
70	<i>Syncarpia glomulifera</i>	10	3	200	Good	Good	2.4	1.7	6	Medium	Remove	Drainage relocation
71	<i>Acacia fimbriata</i>	7	10	250	Moderate	Poor	3	1.9	1	Low	Remove	Motorway
72	<i>Acacia fimbriata</i>	8	6	250	Moderate	Poor	3	1.9	1	Low	Remove	Motorway
73	<i>Acacia fimbriata</i>	8	7	250	Moderate	Poor	3	1.9	2	Low	Remove	Motorway

No	Botanical name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	TPZ (mm)	SRZ (mm)	Trees per group	Retention value	Outcome	Reason
74	<i>Acacia fimbriata</i>	7	7	250	Good	Moderate	3	1.9	3	Low	Remove	Motorway
75	<i>Acacia fimbriata</i>	9	7	250	Good	Moderate	3	1.9	3	Low	Remove	Motorway
76	<i>Acacia fimbriata</i>	7	6	200	Good	Moderate	2.4	1.7	2	Low	Remove	Motorway
77	<i>Acacia fimbriata</i>	8	4	200	Good	Moderate	2.4	1.7	7	Low	Remove	Motorway
78	<i>Acacia fimbriata</i>	8	9	250	Good	Moderate	3	1.9	1	Low	Remove	Motorway
79	<i>Acacia fimbriata</i>	7	6	200	Good	Moderate	2.4	1.7	2	Low	Remove	Motorway
80	<i>Acacia fimbriata</i>	6	4	150	Good	Moderate	2	1.5	2	Low	Remove	Motorway
81	<i>Acacia fimbriata</i>	4	4	150	Good	Good	2	1.5	3	Low	Remove	Motorway
82	<i>Acacia fimbriata</i>	10	9	250	Good	Moderate	3	1.9	3	Low	Remove	Motorway
83	<i>Casuarina glauca</i>	16	9	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Motorway
84	<i>Acacia fimbriata</i>	5	2	150	Good	Moderate	2	1.5	13	Medium	Remove	Motorway
85	<i>Casuarina glauca</i>	12	8	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Motorway
86	<i>Eucalyptus robusta</i>	10	8	300	Good	Moderate	3.6	2	1	Medium	Remove	Motorway
87	<i>Eucalyptus robusta</i>	10	8	250	Good	Good	3	1.9	1	Medium	Remove	Motorway
88	<i>Eucalyptus robusta</i>	12	9	300	Good	Moderate	3.6	2	1	Medium	Remove	Motorway
89	<i>Casuarina glauca</i>	6	2	150	Good	Good	2	1.5	15	Medium	Remove	Motorway
90	<i>Casuarina glauca</i>	12	4	250	Good	Moderate	3	1.9	10	Medium	Remove	Motorway
91	<i>Casuarina glauca</i>	6	3	150	Good	Good	2	1.5	35	Medium	Remove	Motorway
92	<i>Melaleuca nodosa</i>	10	7	200	Good	Moderate	2.4	1.7	35	Medium	Remove	Motorway
93	<i>Casuarina cunninghamiana</i>	12	6	200	Good	Moderate	2.4	1.7	25	Medium	Remove	Motorway
94	<i>Melaleuca nodosa</i>	8	3	200	Good	Moderate	2.4	1.7	35	Medium	Remove	Motorway
95	<i>Melaleuca nodosa</i>	9	3	200	Good	Moderate	2.4	1.7	65	Medium	Remove	Motorway
96	<i>Melaleuca nodosa</i>	8	2	200	Good	Moderate	2.4	1.7	35	Medium	Remove	Motorway
97	<i>Melaleuca nodosa</i>	8	3	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
98	<i>Melaleuca nodosa</i>	8	3	200	Good	Moderate	2.4	1.7	35	Medium	Remove	Motorway
99	<i>Acacia fimbriata</i>	8	2	200	Good	Moderate	2.4	1.7	35	Low	Remove	Motorway
100	<i>Eucalyptus moluccana</i>	12	6	250	Good	Good	3	1.9	7	Medium	Remove	Motorway
101	<i>Melaleuca nodosa</i>	5	2	150	Good	Moderate	2	1.5	30	Medium	Remove	Motorway
102	<i>Casuarina glauca</i>	10	7	250	Good	Moderate	3	1.9	7	Medium	Remove	Motorway
103	<i>Casuarina glauca</i>	12	7	250	Good	Moderate	3	1.9	25	Medium	Remove	Motorway
104	<i>Eucalyptus moluccana</i>	14	8	300	Good	Good	3.6	2	7	Medium	Remove	Motorway
105	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
106	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	55	Medium	Remove	Motorway
107	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
108	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
109	<i>Eucalyptus moluccana</i>	14	9	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Motorway
110	<i>Casuarina cunninghamiana</i>	12	5	250	Good	Moderate	3	1.9	35	Medium	Remove	Motorway

No	Botanical name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	TPZ (mm)	SRZ (mm)	Trees per group	Retention value	Outcome	Reason
111	<i>Casuarina cunninghamiana</i>	12	5	250	Good	Moderate	3	1.9	35	Medium	Remove	Motorway
112	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
113	<i>Casuarina glauca</i>	12	4	200	Good	Moderate	2.4	1.7	35	Medium	Remove	Motorway
114	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	35	Medium	Remove	Motorway
115	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
116	<i>Casuarina glauca</i>	13	4	250	Good	Moderate	3	1.9	40	Medium	Remove	Motorway
117	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	35	Medium	Remove	Motorway
118	<i>Casuarina glauca</i>	12	4	250	Good	Moderate	3	1.9	25	Medium	Remove	Motorway
119	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
120	<i>Eucalyptus moluccana</i>	15	6	350	Good	Moderate	4.2	2.1	4	Medium	Remove	Motorway
121	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
122	<i>Acacia parramattensis</i>	10	3	150	Good	Moderate	2	1.5	35	Low	Remove	Motorway
123	<i>Melaleuca nodosa</i>	5	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
124	<i>Acacia parramattensis</i>	6	2	150	Good	Moderate	2	1.5	65	Low	Remove	Motorway
125	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	65	Medium	Remove	Motorway
126	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	65	Medium	Remove	Motorway
127	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	65	Medium	Remove	Motorway
128	<i>Melaleuca nodosa</i>	9	2	150	Good	Moderate	2	1.5	65	Medium	Remove	Motorway
129	<i>Casuarina glauca</i>	13	4	250	Good	Good	3	1.9	35	Medium	Remove	Motorway
130	<i>Melaleuca nodosa</i>	5	2	150	Moderate	Moderate	2	1.5	35	Medium	Remove	Motorway
131	<i>Casuarina glauca</i>	8	3	150	Good	Moderate	2	1.5	10	Medium	Remove	Motorway
132	<i>Melaleuca nodosa</i>	9	2	150	Good	Moderate	2	1.5	15	Medium	Remove	Motorway
133	<i>Casuarina glauca</i>	15	6	250	Good	Moderate	3	1.9	10	Medium	Remove	Motorway
134	<i>Casuarina glauca</i>	12	4	250	Good	Moderate	3	1.9	12	Medium	Remove	Motorway
135	<i>Eucalyptus robusta</i>	12	9	350	Good	Moderate	4.2	2.1	1	Medium	Remove	Motorway
136	<i>Melaleuca nodosa</i>	8	3	200	Good	Moderate	2.4	1.7	45	Medium	Remove	Motorway
137	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	45	Medium	Remove	Motorway
138	<i>Melaleuca nodosa</i>	7	2	150	Good	Moderate	2	1.5	65	Medium	Remove	Motorway
139	<i>Melaleuca nodosa</i>	8	2	200	Good	Moderate	2.4	1.7	65	Medium	Remove	Motorway
140	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	55	Medium	Remove	Motorway
141	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	65	Medium	Remove	Motorway
142	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	55	Medium	Remove	Motorway
143	<i>Acacia parramattensis</i>	9	2	150	Good	Moderate	2	1.5	55	Low	Remove	Motorway
144	<i>Casuarina glauca</i>	14	4	200	Good	Moderate	2.4	1.7	25	Medium	Remove	Motorway
145	<i>Casuarina glauca</i>	12	4	200	Good	Moderate	2.4	1.7	35	Medium	Remove	Motorway
146	<i>Melaleuca nodosa</i>	8	2	150	Good	Moderate	2	1.5	65	Medium	Remove	Motorway
147	<i>Acacia parramattensis</i>	8	2	150	Good	Moderate	2	1.5	55	Low	Remove	Motorway
148	<i>Eucalyptus moluccana</i>	14	8	300	Good	Moderate	3.6	2	7	Medium	Remove	Motorway

No	Botanical name	Height (m)	Spread (m)	DBH (mm)	Health	Structure	TPZ (mm)	SRZ (mm)	Trees per group	Retention value	Outcome	Reason
149	<i>Eucalyptus moluccana</i>	14	8	300	Good	Moderate	3.6	2	8	Medium	Remove	Motorway
150	<i>Acacia parramattensis</i>	8	3	150	Good	Moderate	2	1.5	35	Low	Remove	Motorway
151	<i>Acacia parramattensis</i>	8	2	150	Moderate	Moderate	2	1.5	35	Low	Remove	Motorway
152	<i>Eucalyptus cinerea</i>	14	8	400	Good	Moderate	4.8	2.3	1	Medium	Remove	Required for site access to C3
153	<i>Melaleuca styphelioides</i>	9	8	450	Good	Moderate	5.4	2.4	1	Medium	Remove	Access between C3 and surface works
154	<i>Casuarina glauca</i>	10	4	250	Good	Moderate	3	1.9	9	Medium	Remove	Motorway complex
155	<i>Acacia fimbriata</i>	8	8	250	Good	Moderate	3	1.9	2	Low	Remove	Motorway complex
156	<i>Acacia fimbriata</i>	9	5	250	Moderate	Moderate	3	1.9	6	Low	Remove	These six trees may be retained temporarily, but will require removal for the Motorway complex
157	<i>Casuarina glauca</i>	17	9	450	Good	Moderate	5.4	2.4	2	Medium	Remove	
158	<i>Tristaniopsis laurina</i>	8	7	250	Good	Good	3	1.9	1	Medium	Remove	
159	<i>Eucalyptus botryoides</i>	14	8	450	Good	Good	5.4	2.4	1	Medium	Remove	
160	<i>Callistemon viminalis</i>	5	3	150	Good	Moderate	2	1.5	3	Medium	Remove	
161	<i>Melaleuca styphelioides</i>	6	3	200	Good	Moderate	2.4	1.7	1	Medium	Remove	

RECOMMENDATIONS

Trees Recommended for Retention

Only six (6) trees have been assessed for temporary retention – Tree tag No. 156 (grouping of 6 *Acacia fimbriata* trees). These trees have value in stabilising a current embankment and should be retained until removal is required for the construction of the motorway operations complex. Tree protection will be required in order to successfully retain these trees.

Tree protection fencing must be established around the perimeter of the TPZ. Existing fencing and site hoarding may be used as tree protection fencing. The area within the TPZ is to be mulched with material that complies with Australian Standards, *AS 4454-2012, Composts, soil conditioners and mulches*, and should be maintained at a depth of 50 – 100 mm.

Once each stage is reached, the work will be inspected and certified by the project arborist and the next stage may commence. Alterations to this schedule may be required due to necessity, however, this shall be through consultation with the project arborist only.

Ongoing tree management, including monthly scheduled inspections, will ensure any impacts sustained during the construction period are reduced and recovered over the long term.

Tree Work

- 2,994 trees require removal as they are within the footprint of infrastructure related to the proposed development.
- All tree removal work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture.
- All tree removal work is to be carried out in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998).
- Mulch generated can be used on site, where suitable at other WestConnex projects or disposed of to a licensed facility.

APPENDIX A – Tree Retention Value

Tree Retention Value		
Low	Medium	High
<p>The tree is in fair-poor condition and good or low vigour.</p> <p>The tree has form atypical of the species</p> <p>The tree is not visible or is partly visible from the surrounding properties or obstructed by other vegetation or buildings</p> <p>The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area</p> <p>The tree is a young specimen which may or may not have reached dimensions to be protected by local Tree Preservation Orders or similar protection mechanisms and can easily be replaced with a suitable specimen</p> <p>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</p> <p>The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms</p> <p>The tree has a wound or defect that has the potential to become structurally unsound.</p> <p>The tree is an environmental pest species due to its invasiveness or poisonous/allergenic properties.</p> <p>The tree is a declared noxious weed by legislation</p>	<p>The tree is in fair to good condition</p> <p>The tree has form typical or atypical of the species</p> <p>The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area</p> <p>The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street</p> <p>The tree provides a fair contribution to the visual character and amenity of the local area</p> <p>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</p>	<p>The tree is in good condition and good vigour</p> <p>The tree has a form typical for the species</p> <p>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.</p> <p>The tree is listed as a heritage item, threatened species or part of an endangered ecological community or listed on councils significant tree register</p> <p>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.</p> <p>The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.</p> <p>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.</p>