



ARBORICULTURAL IMPACT ASSESSMENT

37-43 HAY ST COLLAROY 2097

Prepared by Colin Curtis

AQF 5 Arboriculture Diploma

Tree Risk Assessment Qualified (TRAQ)

Member of Arboriculture Australia #2332

Member of the International Society of Arboriculture #228182

completearbor@mail.com

0413 801 557

Prepared for: Collaroy Living

27/06/2022

EXECUTIVE SUMMARY

Complete Arborcare has been commissioned by Built Projects to produce an Arboricultural Impact Assessment (AIA) regarding the proposed development of Lots 43/12/DP10648,44/12/DP10648,45/12/DP10648 & 46/12/DP10648 Nos.37-43 Hay St, Collaroy 2097 (respectively).

Nine (9) x trees upon and adjacent to the subject site were assessed to produce this report.

Following an assessment of construction impacts (detailed in section 7 of this report) the following recommendations (detailed in section 9 of this report) have been developed.

- 9.1 Trees T1,T2 & T4 will be required to be removed if the proposed works are approved (subject to council approval).These trees have all been assessed to have a low retention.
- 9.2 Tree T3 has been assessed to be in state of decline, therefore removal is recommended (subject to council approval).This tree has been assessed to have a low retention.
- 9.3 Tree T5,T6 & T9 will require fencing protection to be installed before any of the proposed works commence. This protection must stay in place until the completion of all works & must be compliant with sections 4.3 (Protective Fencing) and 4.4 (Signs) of AS 4970 (and Appendix C of this report).
- 9.4 It has been concluded that the proposed works will result in long term (unsustainable) impacts upon trees T7 & T8,therefore removal is recommended (subject to council approval).

CONTENTS

37-43 Hay St Collaroy 2097	0
Executive Summary	i
1. Introduction	3
2. Legislation Requirements	3
3. The Site	4
4. Method	5
5. Observations	6
6. Tree Retention Values	7
7. Construction Impacts	8
8. Documents used in the Preparation of this Report	8
9. Recommendations/Conclusions	9
10. Limitations on the Use of this Report	9
11. Assumptions	9
12. References	10
Relevant Appendices - Appendix A: Glossary Of Terms	11
Appendix B: Significance of a Tree, Assessment Rating System* (IACA 2010) – S.T.A.R.S. ©	12
Appendix C: Example of Tree Protection Fencing & Signage	14

1. INTRODUCTION

- 1.1 Complete Arborcare has been commissioned by Built Projects to produce an Arboricultural Impact Assessment (AIA) regarding the proposed development of Lots: 43/12/DP10648,44/12/DP10648,45/12/DP10648 & 46/12/DP10648 (Nos.37-43 Hay St, Collaroy 2097). Here after mentioned as the subject site.
- 1.2 This AIA is to be part of a Development Application (DA). It has been prepared following the guidelines provided in Australian Standard (AS) 4970-2009, Protection of Trees on Development Sites and AS 4373-2007, Pruning of Amenity Trees.

2. LEGISLATION REQUIREMENTS

- 2.1 The subject site is zoned R2: Low Density Residential (NSW Government - Planning & Environment).
- 2.2 NBC (Northern Beaches Council, 2017) considers a tree to be:
- (a) any palm or woody perennial plant greater than five (5) metres in height or any palm or woody perennial plant with a canopy greater than 10 m in width; or
- (b) any native palm or native woody perennial plant at any stage of its lifecycle that is 0.5 metres or greater in height and is within any area mapped by Council as containing:
- Threatened and High Conservation Habitat.
 - Wildlife Corridors .
 - Native Vegetation known or potential habitat for threatened species, populations or ecological communities
- 2.3 State Environmental Planning Policy (Biodiversity & Conservation) 2021 (NSW Government, 2021) has been considered in the preparation of this report. The aims of the policy are to;
- (a) *to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and*
- (b) *to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation.*

3. THE SITE



Figure 1: The subject site bordered by red line (metromap 2023).

4. METHOD

- 4.1 The subject site & trees were visually assessed from ground level on the 5th April 2023. The *Genus/species* of the subject trees were recorded as well as dimensions of Diameter at Breast Height (DBH) and Diameter at Base (DAB), along with crown and canopy width. Height and age of the trees were estimated as well as the percentage of deadwood. The subject trees were given a condition / vigour rating and signs and symptoms of pests and diseases were noted (if apparent). Structural defects were looked for and comments recorded.
- 4.2 Calculations have been made using guidelines supplied in AS 4970-2009, specifically in relation to:
- Tree Protection Zone (TPZ)
 - Structural Root Zone (SRZ)
 - Estimated Live Crown Size (ELCS)
- 4.3 The trees have been allocated a landscape significance rating of Low, Medium or High using the *IACA Significance of a Tree, Assessment Rating System (STARS)*© (IACA, 2010). Stars assessment criteria includes:
- Condition and Vigour
 - Form, species specific
 - Provenance, age and botanical significance
 - Heritage and Ecological significance
 - Size, shape, and local amenity value
 - Restrictions to tree growth
- Appendix B contains the assessment criteria in full.
- 4.4 The trees have been given a Useful Life Expectancy (ULE) rating, categorised as either:
- Long – 40+ years
 - Medium – 15-40 years
 - Short – 5-15 years
 - Consider for removal - <5 years
- 4.5 Any vegetation not mentioned in this report was either defined as not to be a prescribed tree (due to its dimensions), exempt species and/or had no TPZ encroachment.

5. OBSERVATIONS

5.1 Listed in Table 1 below are observations from the subject tree relating to:

- Health and condition.
- Deadwood. An overall % has been estimated.
- Structural defects and comments.
- Any signs/symptoms of pest and disease attack.

Tree No.	Common Name <i>Genus/species</i>	Health/Condition	Dead wood %	Structural Defects	Pests/ Disease
1	<i>Illawarra Plumb</i> <i>Podocarpus elatus</i>	F/F	<5	None observed	None observed
2	Poinciana <i>Delonix regia</i>	G/G	<5	None observed	None observed
3	Paper Bark <i>Melaleuca</i> <i>quinquinervia</i>	D/P	10-15%	Stem inclusions	None observed
4	Photinia <i>Photinia x fraseri</i>	F/F	<5	None observed	None observed
5	Bottle Brush <i>Callistemon viminalis</i>	F/F	<5	None observed	None observed
6	Photinia <i>Photinia x fraseri</i>	F/F	<5	None observed	None observed
7	Lemon Scented Gum <i>Corymbia citriodora</i>	G/G	<5≤5	None observed	None observed
8	Swamp Mahogany <i>Eucalyptus robusta</i>	F/P	≤5	None observed	None observed
9	Illawarra Flame Tree <i>Brachychiton</i> <i>acerifolius</i>	F/F	<5	None observed	None observed

Table 1: Tree Observations

5.2 Listed in Table 2 below are measurements from the subject tree relating to:

- Age.
- Tree height.
- Lowest scaffold branch.
- Canopy spread – measured to the North, East, South and West (N,S,E,W).
- Diameter at breast height (DBH).
- Diameter above buttress (DAB).

Tree No.	<i>Genus/species</i>	Age	Height (m)	Spread (m)				DBH (cm)	DAB (cm)
				N	S	E	W		
1	<i>Podocarpus elatus</i>	M	8	2	2	2	2	28	33
2	<i>Delonix regia</i>	M	6	7	2	3	3	38	44
3	<i>Melaleuca quinquinervia</i>	M	12	6	6	3	3	65	46
4	<i>Photinia x fraseri</i>	M	6	3	3	3	3	30	55
5	<i>Callistemon viminalis</i>	M	4	3	3	3	3	26	44
6	<i>Photinia x fraseri</i>	M	4	2	2	2	2	20	28
7	<i>Corymbia citriodora</i>	M	12	8	6	6	6	53	60
8	<i>Eucalyptus robusta</i>	M	10	6	1	5	4	74	75
9	<i>Brachychiton acerifolius</i>	M	6	4	4	4	4	44	40

Table 2: Tree Measurements

5.3 Listed in Table 3 Below are calculations from the subject trees relating to:

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Estimated Live Crown Size (ELCS)

Tree No.	Genus/species	SRZ (m)	TPZ (m)	Estimated Live Crown Size (m ²)
1	<i>Podocarpus elatus</i>	2.08	3.36	12
2	<i>Delonix regia</i>	2.37	4.56	40
3	<i>Melaleuca quinquinervia</i>	2.39	7.8	55
4	<i>Photinia x fraseri</i>	2.57	3.6	30
5	<i>Callistemon viminalis</i>	2.37	3.12	35
6	<i>Photinia x fraseri</i>	1.94	2.4	12
7	<i>Corymbia citriodora</i>	2.67	6.36	120
8	<i>Eucalyptus robusta</i>	2.93	8.84	40
9	<i>Brachychiton acerifolius</i>	2.25	5.28	40

Table 3: Tree Calculations

6. TREE RETENTION VALUES

6.1 Trees have been allocated a retention value using the priority Matrix in the *IACA Significance of a Tree, Assessment Rating System (STARS)©* (IACA, 2010). The Matrix uses the Landscape Significance rating combined with the Useful Life Expectancy (ULE) to determine a retention value of either;

- Priority for Retention (High) – All measures must be taken to retain and protect these trees. If the guidelines set out in AS4970-2009 Protection of trees on development sites cannot be used to protect the trees, design modification or re-location of the proposed development should be considered.
- Consider for Retention (Medium) – Retention of these trees should remain a priority. If the trees are adversely affecting the proposed development and all protection measures have been considered but are not viable, removal can be considered.
- Consider for Removal (Low) – Retention of these trees is not important. No modification to design should be considered for their retention.
- Priority for Removal – Trees in an irreversible decline, weed species or hazardous trees. These trees should be removed.

Tree No.	Genus/Species	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	<i>Podocarpus elatus</i>	Low	Medium-Low	Low
2	<i>Delonix regia</i>	Low	Medium	Low
3	<i>Melaleuca quinquinervia</i>	Medium	Short	Low
4	<i>Photinia x fraseri</i>	Low	Short	Low
5	<i>Callistemon viminalis</i>	Medium	Medium	Medium
6	<i>Photinia x fraseri</i>	Low	Medium	Low
7	<i>Corymbia citriodora</i>	Medium	Medium	Medium
8	<i>Eucalyptus robusta</i>	Medium	Medium	Medium-Low
9	<i>Brachychiton acerifolius</i>	Medium	Medium-Short	Medium-Low

Table 4: Tree Retention Values

7. CONSTRUCTION IMPACTS

7.1 Listed in table 5 below are likely impacts from the proposed construction upon the trees.

Tree No.	Proposed encroachments into TPZ and/or canopy	Likely Impacts from the proposed construction (Discussion)
1,2 & 4	Major 100% TPZ/SRZ encroachments.	Tree death.
3	A major approximate 20% TPZ encroachment.	Possible loss of structural woody and non woody roots, which has the potential to result in tree decline.
5,6 & 9	No TPZ or canopy encroachments.	None foreseen.
7	A major approximate 30% TPZ/SRZ encroachment. Extensive northern face canopy pruning.	Possible loss of structural woody and non woody roots, which has the potential to result in tree decline. Loss of northern canopy altering tree symmetry, which will also affect damping.
8	A major approximate 40% TPZ/SRZ encroachment. Canopy pruning may also be required.	Possible loss of structural woody and non woody roots, which has the potential to result in tree decline. Potential loss of northern canopy altering tree symmetry, which will also affect damping.

Table 5: Construction Impacts

8. DOCUMENTS USED IN THE PREPARATION OF THIS REPORT

8.1 Listed in Table 6 below are documents used in the preparation of this report.

Document type	Source/ Author	Title	Date	Summary
Plan	Popov Bass	Site Plan & Basement Plan	22/06/2023	Site & basement plans shown over the proposed development (Drawing No:0638-DA 104) revision E & (Drawing No:0638-DA 105) Revision F.
Plan	Complete Arborcare	TPZ/SRZ Plans	26/06/2023	TPZ/SRZ plans shown over the proposed development.

Table 6: Documents used in the preparation of this report

9. RECOMMENDATIONS/CONCLUSIONS

- 9.1 Trees T1,T2 & T4 will be required to be removed if the proposed works are approved (subject to council approval).These trees have all been assessed to have a low retention.
- 9.2 Tree T3 has been assessed to be in state of decline, therefore removal is recommended (subject to council approval).This tree has been assessed to have a low retention.
- 9.3 Tree T5,T6 & T9 will require fencing protection to be installed before any of the proposed works commence. This protection must stay in place until the completion of all works & must be compliant with sections 4.3 (Protective Fencing) and 4.4 (Signs) of AS 4970 (and Appendix C of this report).
- 9.4 It has been concluded that the proposed works will result in long term (unsustainable) impacts upon trees T7 & T8,therefore removal is recommended (subject to council approval).

10. LIMITATIONS ON THE USE OF THIS REPORT

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, & directly attached to that submission, report or presentation.

11. ASSUMPTIONS

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible; however, the author of this report can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the trees that were examined & reflects the condition of the trees at the time of inspection.

The inspection was limited to visual examination of the subject trees without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

This report does not represent or contain a tree risk assessment.

12. REFERENCES

IACA, 2010. *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia. [Online] Available at: www.iaca.org.au [Accessed 19th June 2015].

metromap, 2021. *metromap*. [Online]
Available at: <https://web.metromap.com.au/map>
[Accessed 27th June 2023].

NSW Government, 2021. *State Environmental Planning Policy (Biodiversity & Conservation)*. [Online]
Available at: <https://legislation.nsw.gov.au/view/html/inforce/current/epi-2021-0722>
[Accessed 23rd May 2022].

Council, W., 2015. *Trees & Developments*. [Online]
Available at: <http://www.warringah.nsw.gov.au/planning-and-development/trees-and-development>
[Accessed 24th of June 2017].

NSW Government, 2019. *NSW Planning Portal*. [Online]
Available at: <https://www.planningportal.nsw.gov.au/find-a-property>

Standards Australia, 2009. AS 4970-2009, Protection of trees on development sites. Sydney: Standards Australia.

RELEVANT APPENDICES - APPENDIX A: GLOSSARY OF TERMS

Photographs – all images have been taken from metromap.

Common Name/*Genus species* - the common name and genus/ species of the tree.

Age Class- assessment of the trees current age.

Immature (IM) - refers to a tree at growth stages between immaturity and full size.

Semi-mature (SM) - refers to a full-sized tree with some capacity for further growth.

Mature (M) - refers to a full-sized tree with some capacity for further growth.

Over-mature (OM) - a mature tree has reached a near stable size (biomass) above and below the ground. Trees can have a Mature Age Class for > 90% of their life span. Over-mature (**OM**) trees show symptoms of irreversible decline and decreasing biomass.

Live Stag (LS) - refers to a tree in a significant state of decline. This is the last stage of a tree prior to death.

Height - estimated overall height of the tree.

Diameter at Breast Height (DBH) - the trunk diameter at breast height (in metres) of the tree, 1.4 meters above ground level.

Diameter above the Buttress (DAB) - refers to the tree trunk diameter measured above the root buttress and is used to calculate the radius of the SRZ.

Tree Protection Zone (TPZ) - is a “No Go Zone” surrounding a tree to aid in its ability to cope with disturbances associated with construction works. Tree protection involves minimising root damage that is caused by activities such as construction. Tree protection also reduces the chance of a tree’s decline in health or death & the possibly damage to structural stability of the tree from root damage.

Structural Root Zone (SRZ) – the structural root zone is the area required for the tree’s stability. A larger area is required to maintain a viable tree. The SRZ is only needed to be calculated when a major encroachment into the TPZ is proposed. There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rock and footings.

Health - Good (G), Fair (F) or Poor (P) – this refers to the trees vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback.

Condition – Excellent (E), Very Good (VG), Good (G), Fair (F), Declining (D), Poor (P), Very Poor (VP).this refers to the tree’s form & growth habit, as modified by its environment (aspect suppression by other tree/s, soils,) & the state of the scaffold (i.e. trunk & major branches),including structural defects such as cavities, crooked trunks or weak trunk/branch junctions. These are not directly connected with health & it is possible for a tree to be healthy but in poor condition/vigour.

Deadwood – this refers to any whole limb that no longer contains living issues (i.e. living leaves & /or bark).Some dead wood is common in a number of species.

Crown Spread - the greatest width from drip line to drip line of a branch across the trees crown.

Estimated Live Crown Size (ELCS) - the area of the crown as viewed from one aspect.

APPENDIX B: SIGNIFICANCE OF A TREE, ASSESSMENT RATING SYSTEM* (IACA 2010) – S.T.A.R.S. ©

Significance of a Tree, Assessment Rating System* (IACA 2010) – S.T.A.R.S. ©

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the *Tree Significance - Assessment Criteria* and *Tree Retention Value - Priority Matrix*, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined. An example of its use in an Arboricultural report is shown as Appendix A.



Tree Significance - Assessment Criteria

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.

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*.

Low Significance in landscape

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions,
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species

- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline


- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monoculture stand in its entirety e.g. hedge.

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

Table 1.0 Tree Retention Value - Priority Matrix.

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

USE OF THIS DOCUMENT AND REFERENCING The IACA Significance of a Tree, Assessment Rating System (STARS) is free to use, but only in its entirety and must be cited as follows', 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

REFERENCES Australia ICOMOS Inc. 1999, *The Burra Charter –The Australian ICOMOS Charter for Places of Cultural Significance*, International Council of Monuments and Sites, www.icomos.org/australia Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists(IACA), CSIRO Publishing, Collingwood, Victoria, Australia. Footprint Green Pty Ltd 2001, *Footprint Green Tree Significance & Retention Value Matrix*, Avalon, NSW Australia, www.footprintgreen.com.au IACA 2010, *IACA Significance of a Tree, Assessment Rating System (STARS)*, Institute of Australian Consulting Arboriculturists, www.iaca.org.au

APPENDIX C: EXAMPLE OF TREE PROTETION FENCING & SIGNAGE

Tree protection Fencing must be a minimum of 1.8 metres in height and be held in place with locking clamps and concrete feet between each panel (an example of protective fencing and signage is shown below).



TREE PROTECTION ZONE



NO ACCESS

Site Arborist:
Colin Curtis
Complete Arborcare
0413801557
completearbor@mail.com

Restricted Activities in the Tree Protection Zone
According to AS 4970-2009, activities excluded from the TPZ include but are not limited to-

- machine excavation including trenching
 - excavation for silt fencing
 - cultivation
 - storage
- preparation of chemicals, including preparation of cement products
 - parking of vehicles and plant
 - refuelling
 - dumping of waste
- wash down and cleaning of equipment
 - placement of fill
 - lighting of fires
 - soil level changes
- temporary or permanent installation of utilities and signs
 - physical damage to the tree.

Source Australian Standard AS 4970-2009 Protection of trees on development sites.