

# Arboricultural Impact Assessment

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Prepared for Alex Hill  
Site Address: 91 Florida Road Palm Beach

28<sup>th</sup> January 2021

Member of Arboriculture Australia No. 1286

Member of International Society of Arboriculture No. 157768

Bachelor of Horticultural Science, University Sydney.

AQF Level 2, 3 & 5 Diploma in Arboriculture

Graduate Certificate AQF Level 8 University Melbourne

Tree Risk Assessment Qualification (TRAQ)

## **Statement**

Bradshaw Consulting Arborists is a company that exclusively provides tree consultancy within the tree industry. There is no conflict of interest concerning the recommendations outlined in this report.

Bradshaw Consulting Arborists (Tristan Bradshaw)

Po Box 48 St Ives 2075

0411 608 001

[info@bradshawtreeservices.com.au](mailto:info@bradshawtreeservices.com.au)

# Arboricultural Impact Assessment

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# Arboricultural Impact Assessment

## 1 Introduction

This report has been prepared by Tristan Bradshaw of Bradshaw Consulting Arborists for Alex Hill at the property 91 Florida Road Palm Beach. The report request was to inspect 48 trees throughout the property and surrounding properties.

The trees' characteristics have been listed in Table 1 page 6. The aim is to determine the health and condition of the trees and provide information regarding the proposed development. The inspection of the site was undertaken on 12<sup>th</sup> July 2020 and again on the 16<sup>th</sup> November 2020.

The report was completed on 15<sup>th</sup> July 2020 as a pre-DA report. The final report was completed on 28<sup>th</sup> January 2021.

Architectural plans supplied by Robert Jones Architecture dated January 2021 and Survey plan supplied by Bee & Lethbridge Surveyors dated 22<sup>nd</sup> June 2020 have been used to locate the trees at this property.

See appendix B Section 6 for tree locations and tree protection plan.

The site's trees are managed under Northern Beaches Council's Urban Tree Management Policy.

The property is not heritage, yet it is within the Florida Road heritage conservation area.

There are no exempt tree works as the property because it is located within a heritage conservation area.

The property is within an area of biodiversity.

The property is not within a 10/50 Vegetation clearing entitlement area.

### 1.1 The Site

The site is composed of a dwelling and surrounding garden.

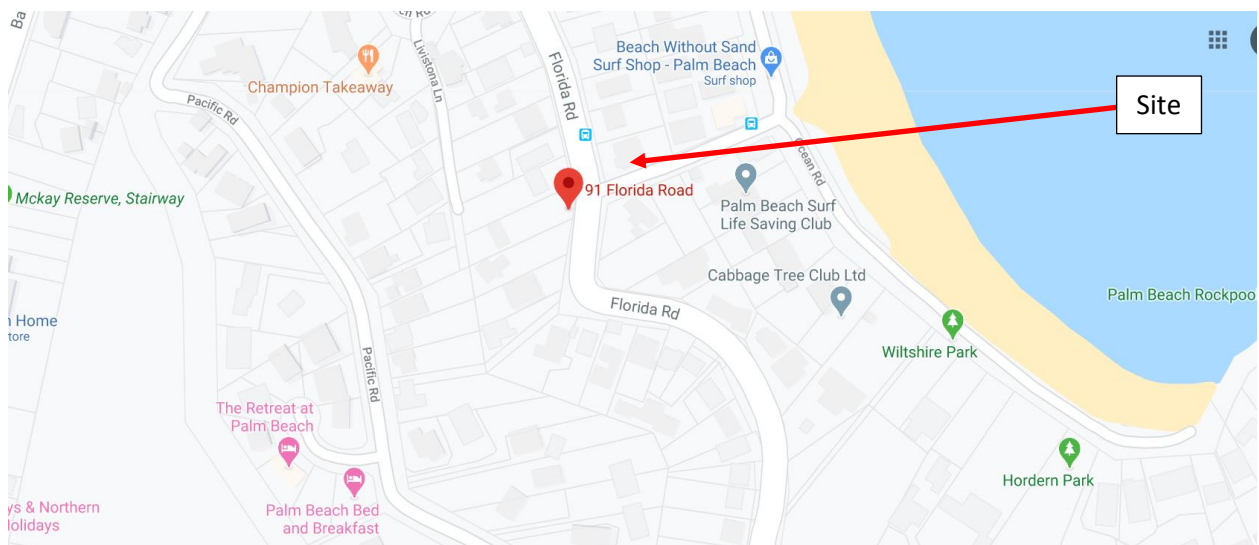


Figure 1 Site location (Google Maps 2020)

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## 1.2 Method

The inspection of the site was undertaken on 12<sup>th</sup> July 2020 and again on the 16<sup>th</sup> November 2020.

The inspection method used was the Visual Tree Assessment (VTA) method (Mattheck & Breloer 2010). This method involves inspecting the trees from ground level, using binoculars to aid in identification of any external signs of decay, physical damage, growth related structural defects and the site conditions where the tree is growing. This method will ascertain whether there is need for a more detailed inspection of any part of the tree. No aerial or subterranean inspections were carried out. See appendix A for the complete flow chart.

The Diameter at Breast Height (DBH) was estimated. The height of the measurement was at 140 cm above the ground.

The height of the tree was estimated.

The canopy spread of the tree was estimated.

All trees on the site have been numbered with metal tags.

**Health:** Based on vigour, callus development, % of deadwood, dieback, fruiting levels, internode lengths

(E) Excellent

(G) Good

(F) Fair

(P) Poor

(D) Dead

**Age Class:** (Y) Young=Recently Planted

(S) Semi mature <20% of life expectancy

(M) Mature 20-80% of life expectancy

(O) Over Mature >80% of life expectancy

**Condition:** Based on the structural integrity of the tree, cavities, fungal decay, branch failure, branch taper, sap or Kino exudate, fruiting bodies, root condition.

(E) Excellent

(G) Good

(F) Fair

(P) Poor

(D) Dead

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## **Visual Habitat**

This assessment is based on a visual observation of the tree, included in the VTA method.

Habitat trees are trees that provide microhabitats, these can include hollows, deeply fissured bark, cracks, epiphytes or forms of decay (Bütler, R., Lachat, T., Larrieu, L., & Paillet, Y., 2013).

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## 2 Body Observations Results

Table 1 Individual tree characteristics

Tree Number	Botanical Name	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove. notes
1	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	380	400	5	3	7	0	9	G	M	P	>40	No	High	High	2.3	4.6	0%	Retain
2	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	430	470	4	4	8	2	9	G	M	P	>40	No	High	High	2.4	5.2	0%	Retain
3	<i>Acacia pycnantha</i> (Golden wattle)	200	220	3	3	3	3	8	F	M	G	5-15	No	Moderate	Low	1.8	2.4	0%	Retain
4	<i>Phoenix canariensis</i> (Canary Island Date Palm)	550	550	4	4	4	4	12	E	M	G	>40	No	High	High	2.6	6.6	0%	Retain
5	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	300	300	2	3	4	1	12	G	M	G	>40	No	High	High	2.0	3.6	0%	Retain
6	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	600	700	5	5	5	5	14	E	M	G	>40	No	High	High	2.8	7.2	0%	Retain
7	<i>Syncarpia glomulifera</i> (Turpentine)	360	380	3	1	3	3	12	F	M	G	5-15	No	Very High	Moderate	2.2	4.3	0%	Retain

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Tree Number	Botanical Name	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove. notes
8	<i>Syncarpia glomulifera</i> (Turpentine)	320	360	1	3	2	2	12	F	M	G	5-15	No	Very High	Moderate	2.2	3.8	0%	Retain
9	<i>Syncarpia glomulifera</i> (Turpentine)	370	450	0	4	3	3	12	F	M	G	5-15	No	Very High	Moderate	2.4	4.4	0%	Retain
10	<i>Syncarpia glomulifera</i> (Turpentine)	440	500	5	2	4	3	12	F	M	G	5-15	No	Very High	Moderate	2.5	5.3	0%	Retain
11	<i>Syncarpia glomulifera</i> (Turpentine)	330	420	4	4	4	4	9	G	M	G	>40	No	Very High	High	2.3	4.0	0%	Retain
12	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	470	470	5	5	6	0	14	G	M	G	>40	No	High	High	2.4	5.6	0%	Retain
13	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	484	490	5	5	5	5	14	G	M	G	>40	No	High	High	2.5	5.8	0%	Retain
14	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	260	300	3	3	0	4	12	G	M	G	>40	No	High	High	2.0	3.1	0%	Retain
15	<i>Syncarpia glomulifera</i> (Turpentine)	260	300	3	3	0	4	12	G	M	G	>40	No	Very High	High	2.0	3.1	0%	Retain

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Tree Number	Botanical Name	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove. notes
16	<i>Syncarpia glomulifera</i> (Turpentine)	270	300	3	3	3	3	11	G	M	G	>40	No	Very High	High	2.0	3.2	0%	Retain
17	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	500	600	5	5	5	5	12	G	M	G	>40	No	High	High	2.7	6.0	0%	Retain
18	<i>Syncarpia glomulifera</i> (Turpentine)	282	390	3	3	3	3	10	F	M	G	15-40	No	Very High	High	2.2	3.4	0%	Retain
19	<i>Syncarpia glomulifera</i> (Turpentine)	230	280	3	3	3	3	11	G	M	G	>40	No	Very High	High	1.9	2.8	0%	Retain
20	<i>Syncarpia glomulifera</i> (Turpentine)	450	470	3	3	3	3	11	G	M	G	>40	No	Very High	High	2.4	5.4	0%	Retain
21	<i>Syncarpia glomulifera</i> (Turpentine)	400	450	4	4	4	4	16	G	M	G	>40	No	Very High	High	2.4	4.8	0%	Retain
22	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	430	480	3	3	7	4	10	G	M	G	>40	No	High	High	2.4	5.2	0%	Retain
23	<i>Syncarpia glomulifera</i> (Turpentine)	200	250	1	4	3	2	10	G	M	G	>40	No	Very High	High	1.8	2.4	0%	Retain



## Arboricultural Impact Assessment

Tree Number	Botanical Name	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove. notes
24	<i>Syncarpia glomulifera</i> (Turpentine)	430	460	4	0	3	3	14	F	O M	G	5-15	No	Very High	Moderate	2.4	5.2	10.4% removing the areas of rock from the TPZ incursion calculation	Retain
25	<i>Syncarpia glomulifera</i> (Turpentine)	500	600	5	5	5	5	14	P	O M	F	5-15	No	Very High	Moderate	2.7	6.0	0%	Retain
26	<i>Banksia serrata</i> (Old Man Banksia)	130	130	1	1	1	1	3	G	S M	G	>40	No	Moderate	Moderate	1.5	2	15%	Retain
27	<i>Cyathea cooperi</i> (Australian Tree Fern)	100	100	1	1	1	1	3	G	M	G	>40	No	Moderate	Moderate	1.5	2	0%	Retain
28	<i>Cyathea cooperi</i> (Australian Tree Fern)	100	100	1	1	1	1	3	G	M	G	>40	No	Moderate	Moderate	1.5	2	0%	Retain
29	<i>Melaleuca armillaris</i> (Bracelet Honey Myrtle)	150	150	1	1	1	1	3	F	M	P	5-15	No	Moderate	Low	1.5	2	0%	Retain
30	<i>Brachychiton acerifolius</i> (Illawarra Flame Tree)	200	200	1	1	1	1	6	P	S M	P	<5	No	Moderate	Very Low	1.7	2.4	0%	Retain

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Tree Number	Botanical Name	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove. notes
31	<i>Brachychiton acerifolius</i> (Illawarra Flame Tree)	320	330	3	3	3	3	12	G	M	G	>40	No	Moderate	Moderate	2.1	3.8	0%	Retain
32	<i>Howea forsteriana</i> (Kentia Palm)	120	140	2	2	2	2	7	G	M	G	>40	No	Moderate	Moderate	1.5	3	0%	Retain
33	<i>Glochidion ferdinandi</i> (Cheese Tree)	270	270	4	4	4	4	10	G	M	G	>40	No	Very High	High	1.9	3.2	0%	Retain
34	<i>Syagrus romanzoffiana</i> (Cocos Palm)	300	300	3	3	3	3	16	G	M	G	>40	No	Moderate	Moderate	2.0	3.6	0%	Retain
35	<i>Trachycarpus fortunei</i> (Windmill Palm)	150	150	1	1	1	1	6	G	M	G	>40	No	Moderate	Moderate	1.5	2	0%	Retain
36	<i>Syncarpia glomulifera</i> (Turpentine)	500	530	6	4	4	4	9	P	O M	P	<5	No	Very High	Low	2.5	6.0	0%	Retain
37	<i>Glochidion ferdinandi</i> (Cheese Tree)	300	300	4	3	4	2	10	F	M	G	>40	No	Very High	High	2.0	3.6	<3%	Retain
38	<i>Glochidion ferdinandi</i> (Cheese Tree)	440	440	5	5	5	5	12	E	M	G	>40	No	Very High	High	2.3	5.3	<10%	Retain

## Arboricultural Impact Assessment

Tree Number	Botanical Name	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove. notes
39	<i>Syncarpia glomulifera</i> (Turpentine)	440	480	6	4	6	3	10	P	O M	P	<5	No	Very High	Low	2.4	5.3	100%	Remove
40	<i>Syncarpia glomulifera</i> (Turpentine)	350	370	3	3	3	3	10	F	M	P	5-15	No	Very High	Moderate	2.2	4.2	100%	Remove
41	<i>Syncarpia glomulifera</i> (Turpentine)	300	300	0	4	3	3	9	G	M	G	>40	No	Very High	High	2.0	3.6	36.8%. If fill from road not within 2.5 metres of the tree the incursion drops to 10%.	Retain
42	<i>Syncarpia glomulifera</i> (Turpentine)	360	390	6	3	4	4	12	F	M	G	>40	No	Very High	High	2.2	4.3	7.8% Road	Retain
43	<i>Syncarpia glomulifera</i> (Turpentine)	300	330	6	0	4	1	6	P	M	P	<5	No	Very High	Low	2.1	3.6	5% Road	Retain
44	<i>Melaleuca quinquenervia</i> (Broad Leafed Paperbark)	280	300	4	0	3	2	7	F	S M	G	5-15	No	High	Moderate	2.0	3.4	21.2% Road	Retain
45	<i>Syncarpia glomulifera</i> (Turpentine)	270	280	6	6	0	0	7	P	S M	P	5-15	No	Very High	Moderate	1.9	3.2	11.1% Road	Retain

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Tree Number	Botanical Name	DBH (mm)	DAB (mm)	Canopy N	Canopy S	Canopy E	Canopy W	Height	Health	Age	Condition	SULE	Visual Habitat	Landscape significance	Retention Value	Structural Root Zone (SRZ)	Tree Protection Zone (TPZ)	Percentage TPZ Incursion	Retain or Remove. notes
46	<i>Syncarpia glomulifera</i> (Turpentine)	300	300	3	3	3	3	11	G	M	G	>40	No	Very High	High	2.0	3.6	6.3% Road	Retain
47	<i>Glochidion ferdinandi</i> (Cheese Tree)	220	250	5	0	4	0	8	G	S M	P	5-15	No	Very High	Moderate	1.8	2.6	0%	Retain
48	<i>Glochidion ferdinandi</i> (Cheese Tree)	270	300	4	2	6	0	9	G	M	F	15-40	No	Very High	High	2.0	3.2	2.8%	Retain

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## Discussion

Forty-Eight trees have been included in this assessment.

Trees 12, 16, 17, 18, 19, 24, 25, 27, 28 are located in the property of 89 Florida Road Palm Beach. Tree 18 is located directly on the boundary and as such any works to the tree will need joint approval from owners of 89 and 91 Florida Road Palm Beach. Trees 12, 16, 17, 18, 19, 25, 27 and 28 are unaffected by the proposal.

The proposed building and raised lawn area constructed beside tree 24 occupies 17.2% of the TPZ of this tree. Areas of exposed rock (no tree roots) are within the TPZ and this area has been removed from the TPZ incursion. The calculated TPZ incursion for tree 24 is 10.7% this is marginally above the 10% stated in AS4970-2009. This tree will be retained and protected. A tree root survey can be conducted however this is unnecessary and adds additional costs to the project.

Trees 1, 2, 3 and 4 are located in the road reserve at the front of the property on Florida Road. These trees are owned by the council. These trees are unaffected by the proposal.

Trees 30, 31, 32, 33, 34, 35 and 36 are located in the property of 93 Florida Road Palm Beach. There is no projected impact to these trees. This is in accordance with AS4970-2009. They are to be retained and protected.

Trees 40 and 44 are located on Livingstonia Lane (not formed and council owned). It is proposed tree 40 is removed to construct the laneway providing access to the proposed garage. This tree is of moderate retention value due to its declining health. The estimated incursion of tree 44 is 21.2%, this is greater than is accepted in AS 4970-2009, however this species is drought tolerant and can withstand 21.2% incursion into the root system (Serbesoff-King, K., 2003). This tree also develops tree root densities much greater than other native tree species giving it increased stability and tolerance. (Lopez-Zamora et al, 2004).

Trees 45, 46, 47 and 48 are located in the property 137 Pacific road Palm Beach. There is no projected impact to tree 47, the incursion of the TPZ to trees 46 and 48 is less than 10%, this conforms to AS 4970-2009. The incursion to tree 45 is 11.1% this is only marginally greater than 10% and is acceptable.

Trees 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 20, 21, 22, 23, 26, 29, 37, 38, 39, 41, 42 and 43 are located within 91 Florida Road Palm Beach. Of these trees, numbers 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 20, 21, 22, 23, 29 have no incursion into the root zones. Tree 26 has 15% incursion; this tree is young and should tolerate the root disturbance. It is also readily replaced if required.

The only proposed structure within the TPZ of tree 37 is a pier for the inclinometer. This will have minimal effect on the tree. This tree is to be retained and protected.

It is proposed tree 38 is retained. The garage and inclinometer are located within the TPZ, inclinometer piers are located outside the SRZ. The proposed works will have minimal impact less than 10% to the TPZ. Subterranean water flows are maintained, however to compensate for loss of surface water, one down pipe from the garage roof should be directed into a soak away uphill from tree 38 along boundary.

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It is proposed tree 39 is to be removed due to its low retention. This tree has approximately 10% foliage cover and is likely to be completely dead within 5 years. Although this tree is of high significance the tree is in extremely poor health and is not worthy of retention.

The impact to tree 41 is 36.8% due to the cut and fill created from the construction of the access road. Provided fill is excluded from within 2.5 metres and natural ground level is maintained within the TPZ of this tree, the impact is calculated at 10%. It is proposed this tree is retained.

Tree 42 has part of the TPZ covered by the carport, this is a piered structure. This will have minimal effect to the tree. The entry road is partially raised with areas of cut and fill, fill from under the road must not extend within 3 metres of this tree. Provided natural ground level to the west is retained within 3 metres of this tree the TPZ encroachment has been calculated at 9.8% and this is within the AS4970-2009 guidelines. The impact to tree 43 has been calculated at 4.2% encroachment. This tree is listed as low retention; however it will be retained.

## 3 Recommendations

1. Removal of trees 39 and 40.
2. Retain trees 1-38 and 41-48.
3. Ensure fill does not encroach within 2.5 metres of tree 41 and 3 metres of trees 42 and 43.
4. Install soak away uphill from tree 38 along boundary.
5. Tree removal should be conducted by an Arborist with a minimum (Australian Qualification Framework) AQF level 3.
6. Work must be undertaken as per the Code of Practice Amenity Tree Industry 1998.
7. The tree removal process and staff should be skilled and undertake the removal of the tree as per the minimum industry standards.
8. Appoint project arborist. Minimum AQF Level 5 with 5 years' experience.
9. Retain and protect trees as per tree protection plan section 6.1. This includes physical fencing of the retained trees, trunk protection and ground protection. See Section 7 Appendix G for specifications.

## 4 Project Arborist Monitoring Stages

Stage	Type of Monitoring	What is required
1	Ensure tree protection has been installed as per tree protection plan section 7.1 prior to any works commencing.	Tree Protection Certification
2	Excavation	Ensure natural ground is retained around protected trees.
3	Sewer relocation, hand excavation supervision.	Supervise and document the works.

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4	Construction. Monitor every 2 months.	Ensure tree protection is in place. Health of trees is maintained.
5	Final certification summarises the attendance to the site and why. Comment on the long-term health of the retained trees. Provide any ongoing recommendations.	Final certificate supplied for occupation certificate

## 5 References

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# Arboricultural Impact Assessment

Biology

Mechanics

## 6 Appendix A

A Visual Tree Assessment Procedure <sup>(2)</sup>

Function

Visual Assessment

Biology

Mechanical

Breakage

Windthrow

- Vitality
  - o leaves
  - o twigs
- bark
- Fungi
- Old branches
- Branches subsiding

- Defect symptoms
  - o bulges
  - o ribs
- Wounds
- Leaning
- Bark cracks
- Other abnormalities

- Root Buttress
- Sail area
- Bottle butt
- Soil cracks

If cause for concern - more detailed inspection required

- Sounding with mallet
- Sound velocity measurement
- Resistograph
- Sonic Tomograph

- Root Buttress
- Sail area
- Bottle butt
- Soil cracks

Increment Borer and Fractometer

Tree Ring Analysis

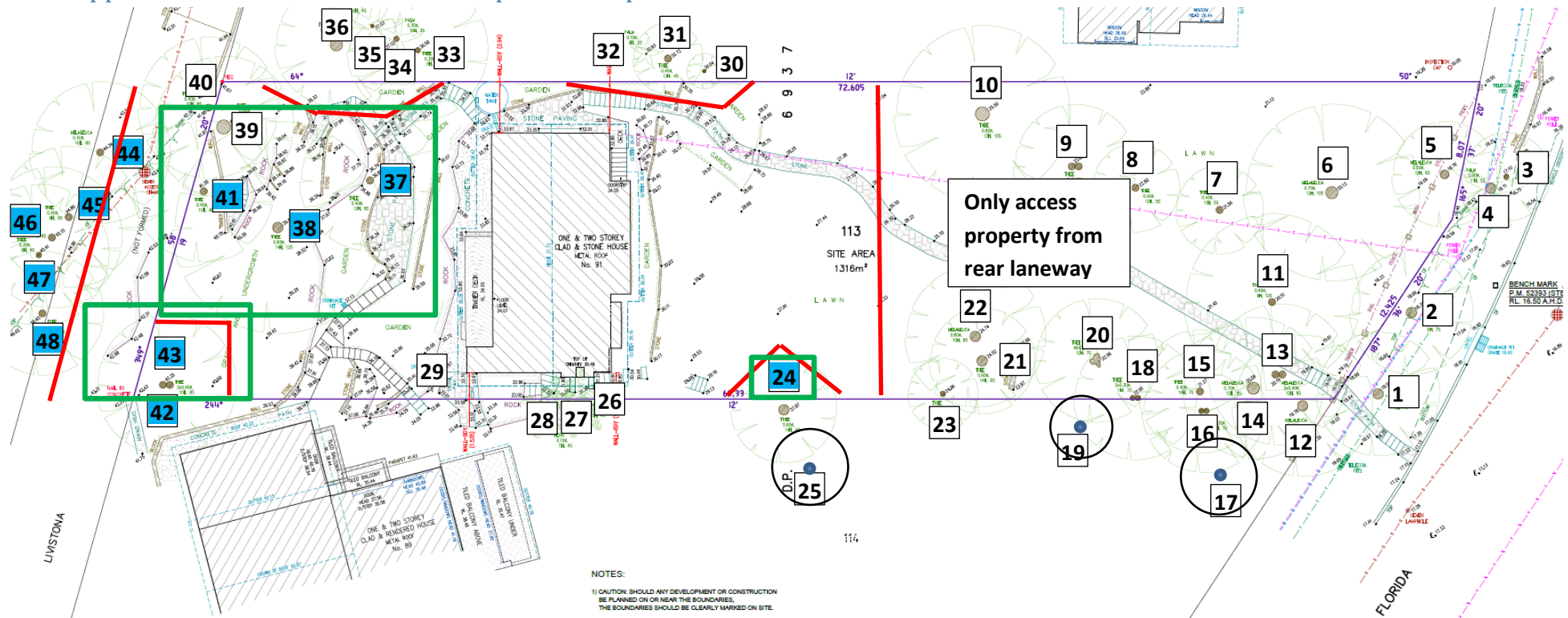
Failure Critical

Decision



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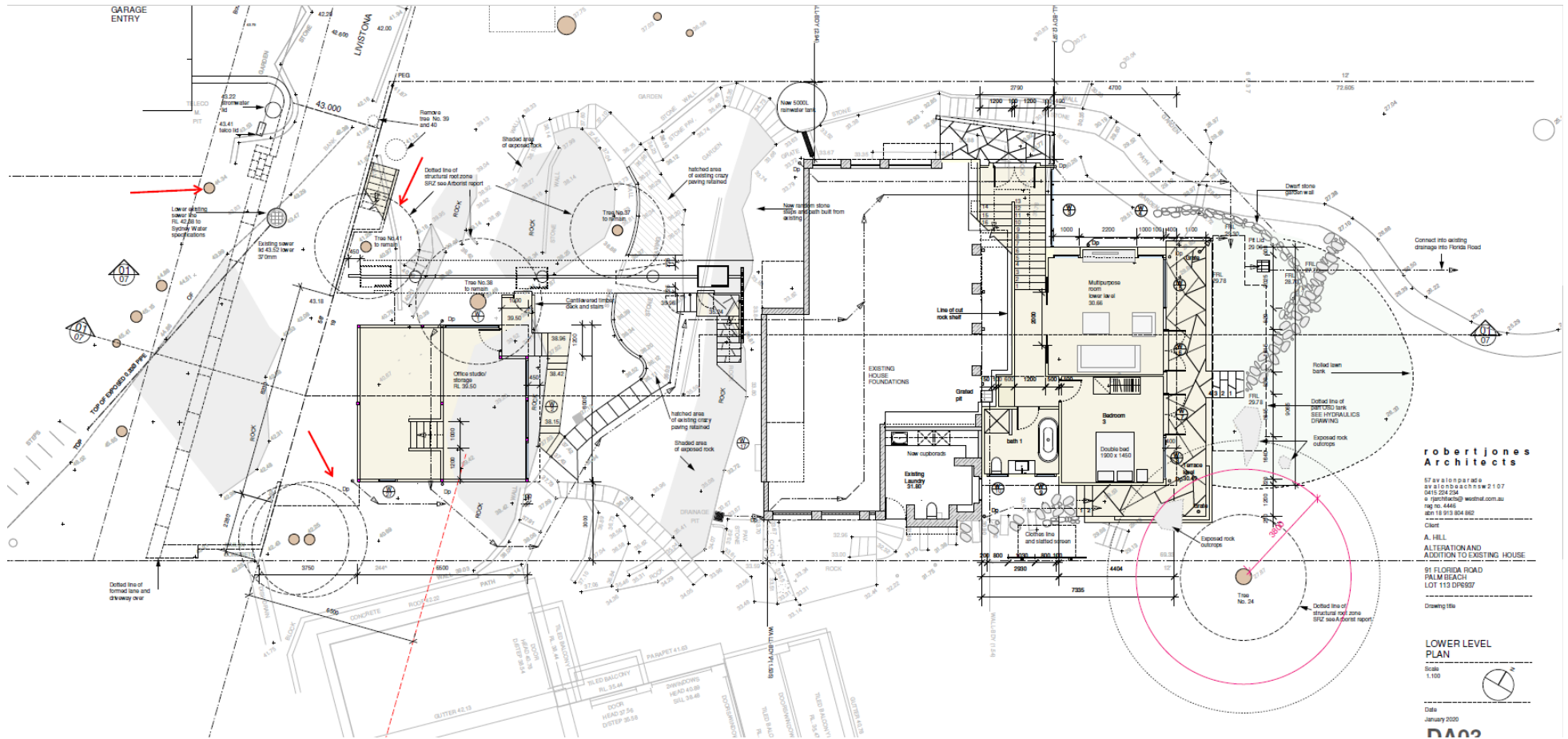
## 6.1 Appendix B Tree locations and tree protection plan



- Tree Protection Fencing
- Ground protection
- Trunk Protection

# Arboricultural Impact Assessment

## 6.1.1 Lower level





# Arboricultural Impact Assessment

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## 6.2 Appendix C Methodology for Determining Tree Retention Value

The aim of this process is to determine the relative value of each tree for retention (i.e. its Retention Value) in the context of development. This methodology assists in the decision-making process by using a systematic approach. The key objective of process is to ensure the retention of good quality trees that make a positive contribution to these values and ensure that adequate space is provided for their long term preservation. The Retention Value of a tree is a balance between its sustainability in the setting in which it is located (the 'landscape') and its significance within that setting (landscape significance).

### Step 1: Determining the Landscape Significance Rating

The 'landscape significance' of a tree is a measure of its contribution to amenity, heritage, and ecological values. While these values are fairly subjective and difficult to assess consistently, some measure is necessary to assist in determining the Retention Value of each tree. To ensure in a consistent approach, the assessment criterion shown in Table 2 should be used. A Tree may be considered 'significant' for one or more reasons. A tree may meet one or more of the criteria in any value category (heritage, ecology or amenity) shown in Table 2 to achieve the specified rating. For example, a tree may be considered 'significant' and given a rating of 1, even if it is only significant based on the amenity criteria.

Based in the criterion in this table, each tree should be assigned a landscape significance rating as follows:

1. Significant
2. Very High
3. High
4. Moderate
5. Low
6. Very Low
7. Insignificant

### Step 2: Determining Safe Useful Life Expectancy (SULE)

The sustainability of a tree in the landscape is a measure of its remaining lifespan in consideration of its current health, condition and suitability to the locality and site conditions. The assessment of the remaining lifespan of a tree is a fairly objective assessment when carried out by a qualified Consulting Arborist. Once a visual assessment of each tree is completed (using the Visual Tree Assessment criteria), the arborist can make an informed judgement about the quality and remaining lifespan of each tree. The Safe Useful Life Expectancy (SULE) methodology (refer to Table 3) can be used to categorise trees as follows:

- Long (Greater than 40 years)
- Medium (Between 15 and 40 years)
- Short (Between 5 and 15 years)
- Transient (less than 5 years)
- **Dead or Hazardous (no remaining SULE)**

The SULE of a tree is calculated based on an estimate of the average lifespan of the species in an urban area, less its estimated current age and then further modified where necessary in consideration of its current health, condition (structural integrity) and suitability to the site.

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## 6.3 Appendix D Table 2 Step 1 Landscape Significance Rating

RATINGS	HERITAGE VALUE	ECOLOGICAL VALUE	AMENITY VALUE
1.  SIGNIFICANT	The subject tree is listed as a Heritage item under the Local Environment Plan (LEP) with a local, state, or national level of significance or is listed on Council's Significant Tree Register.	The subject tree is scheduled as a Threatened Species as defined under the Threatened Species Conversation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999.	The subject tree has a very large live crown size exceeding 100m2 with normal to dense foliage cover, is located in a visually prominent position in the landscape, exhibits very good form and habit typical of the species.
	The subject tree forms part of the curtilage of a Heritage Item (building/structure/artefact as defined under the LEP) and has a known or documented association with that item.	The tree is a locally indigenous species, representative of the original vegetation of the area and is known as an important food, shelter or nesting tree for endangered or threatened fauna species.	The Subject tree makes a significant contribution to the amenity and visual character of the area by creating a sense of place or creating a sense of identity.
	The subject tree is a Commemorative Planting having been planted by an important historical person (s) or to commemorate an important historical event.	The subject tree is a Remnant Tree, being a tree in existence prior to development of the area.	The tree is visually prominent in view form surrounding areas, being a landmark or visible from a considerable distance.
2.  VERY HIGH	The tree has a strong historical association with a heritage item (building/structure/artefact/garden etc) within or adjacent the property and/or exemplifies a particular era or style of landscape design associated with the original development of the site.	The tree is a locally indigenous species representative of the original vegetation of the area and is a dominant or associated canopy species of an Endangered Ecological Community (EEC) formerly occurring in the area occupied by the site.	The subject tree has a very large live crown size exceeding 60m2, a crown density exceeding 70% (normal-dense), is a very good representative of the species in terms of its form and branching habit or is aesthetically distinctive and makes a positive contribution to the visual character and the amenity of the area.
3.  HIGH	The tree has a suspected historical association with a heritage item or landscape supported by anecdotal or visual evidence.	The tree is a locally indigenous and representative of the original vegetation of the area and the tree is located within a defined vegetation link/wildlife corridor or has known wildlife habitat value.	The tree is a good representative of the species in terms of its form and branching habit with minor deviations from normal (e.g. crown distortion/suppression) with a crown density of at least 70% (normal); The subject tree is visible form the street and/or surrounding properties and makes a positive contribution to the visual character and the amenity of the area.
4.  MODERATE	The tree has no known or suspected historical association but does not detract or diminish the value the value of the item and is sympathetic to the original era of planting.	The subject tree is a non-local native or exotic species that is protected under the provisions of the DCP.	The subject tree has a medium live crown size exceeding 25m <sup>2</sup> ; The tree is a fair representative of the species, exhibiting moderate deviations from typical form (distortion/suppression etc) with a crown density of more than 50% (thinning to normal).
			The tree is visible from surrounding properties but is not visually prominent- view may be partially obscured by other vegetation or built forms. The tree makes a fair contribution to the visual character and amenity of the area.
5.  LOW	The subject tree detracts from heritage values and diminishes the value of the heritage item.	The subject tree is scheduled as exempt (not protected) under the provisions of this DCP due to its species, nuisance or position relative to buildings or other structures.	The subject tree has a small live crown of less than 25m <sup>2</sup> and can be replaced within the short term (5-10 years) with new tree planting.
6.  VERY LOW	The subject tree is causing significant damage to a heritage item.	The subject tree is listed as an Environment Weed Species in the Local Government Area, being invasive, or is a nuisance species.	The subject tree is not visible from surrounding properties (visibility obscured) and makes a negligible contribution or has a negative impact on the amenity and visual character of the area. The tree is a poor representative of the species, showing significant deviations from the typical form and branching habit with a crown density of less than 50%.

# Arboricultural Impact Assessment

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## 6.4 Appendix E Table 3 Estimating Safe Useful Life Expectancy (SULE) Step 2

<b>1</b>	Estimate the age of the tree			
<b>2</b>	Establish the average life span of the species			
<b>3</b>	Determine whether the average life span needs to be modified due to local environmental situation			
<b>4</b>	Estimate remaining life expectancy			
	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><b>Life Expectancy</b></td> <td style="padding: 5px;">=</td> <td style="padding: 5px;">average modified life span of species - age of tree</td> </tr> </table>	<b>Life Expectancy</b>	=	average modified life span of species - age of tree
<b>Life Expectancy</b>	=	average modified life span of species - age of tree		
<b>5</b>	Consider how health may affect safety (& longevity)			
<b>6</b>	Consider how tree structure may affect safety			
<b>7</b>	Consider how location will affect safety			
<b>8</b>	Determine safe life expectancy			
	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><b>Safe Life Expectancy</b></td> <td style="padding: 5px;">=</td> <td style="padding: 5px;">life expectancy modified by health, structure and location</td> </tr> </table>	<b>Safe Life Expectancy</b>	=	life expectancy modified by health, structure and location
<b>Safe Life Expectancy</b>	=	life expectancy modified by health, structure and location		
<b>9</b>	Consider economics of management (cost vs benefit of retention)			
<b>10</b>	Consider adverse impacts on better trees			
<b>11</b>	Consider sustaining amenity - making space for new trees			
<b>12</b>	Determine SULE			
	<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;"><b>Safe Useful Life Expectancy</b></td> <td style="padding: 5px;">=</td> <td style="padding: 5px;">safe life expectancy modified by economics, effects on better trees and sustaining amenity</td> </tr> </table>	<b>Safe Useful Life Expectancy</b>	=	safe life expectancy modified by economics, effects on better trees and sustaining amenity
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Ref: Barrell, Jeremy (1996)  
**Pre-development Tree Assessment**  
 Proceedings of the International Conference on Trees and Building Sites (Chicago)  
 International Society of arboriculture, Illinois, USA



## 6.5 Appendix F Table 4 Determining Tree Retention Values

The Retention Value of a tree is increased or diminished based on its sustainability in the landscape, which is expressed as its SULE. A tree that has a high Landscape Significance Rating, but low remaining SULE, has a diminished value for retention and therefore has an appropriate Retention Value assigned. Conversely a tree with a low Landscape Significance Rating even with a long remaining SULE, is also considered of low Retention Value. This logic is reflected in the matrix shown in Table 1.

Once the landscape Significance Rating and SULE category have been determined, the following matrix can be used to determine a relative value (or priority) for retention:

**TABLE 1 – DETERMINING TREE RETENTION VALUES**

	Landscape Significance Rating						
SULE	1	2	3	4	5	6	7
Long - greater than 40 years	<b>High Retention Value</b>						
Medium - 15 to 40 years			Moderate Retention Value				
Short - 5 to 15 years				Low Retention Value			
Transient - less than 5 years				Very Low Retention Value			
Dead or Hazardous							

## 7 Appendix G Tree Protection specifications

### Tree Protection Fencing (See Figure 2 below)

Tree protection is to be carried out on all trees to be retained on site.

All fencing should be at the perimeter of the Tree Protection Zone (TPZ).

The TPZ must be enclosed with a fully supporting chainmesh protective fencing. The fencing shall be secure and fastened to prevent movement. The fencing shall have a lockable opening for access. Roots greater than 30mm diameter are not to be damaged/severed during the construction of the fence. See Figure 2 Drawing taken from AS 4970-2009 below.

The enclosed area must be free of weeds and grass, the application of a 75mm layer of leaf mulch to the tree protection zone (TPZ) must be maintained for the duration of works.

Two signs on either side of the fencing are to be erected showing the name and contact details of the site Arborist and the words NO ENTRY clearly written.

No work is to be undertaken within this Tree Protection Zone; this includes:

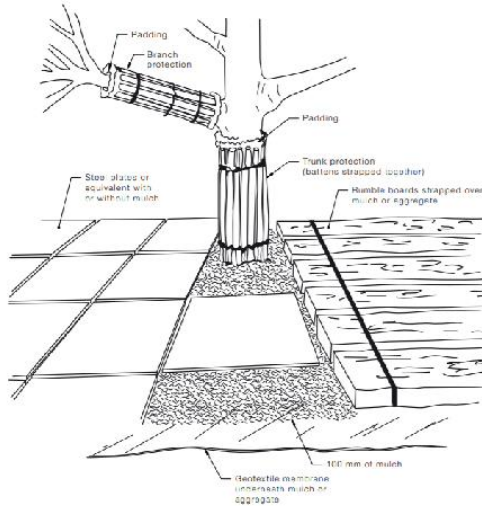
- No removal or pruning of trees
- No construction, stockpiling or storage of chemicals, soil, and cement. Or the movement of machinery, parking and personnel is to occur within the TPZ.
- No refuelling, dumping of waste, placement of fill or Soil level changes.
- No lighting of fires or physical damage to protected trees.
- No temporary or permanent installation of utilities or signs.
- No service trenches should pass through the TPZ.

### Example of tree protection fencing



Figure 2 Drawing taken from AS 4970-2009





- NOTES:
- 1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
  - 2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.



Figure 3 Trunk Protection

Figure 4 Trunk and branch Protection (AS 4970-2009)

## Trunk Protection

Hessian or similar material is used as a wrap around the trunk to a height of 2.6 metres from the base of the tree. Covering the hessian are timbers 100x50x2500mm These are to be spaced around the trunk with gaps of approximately 100mm. The timbers are to be secured with metal strapping. These materials are not to be directly fastened to the tree. See Figure 5 and Figure 4 above.

## Ground protection

Due to the undulating nature of the site the use of timber across the ground is unsuitable and impractical. Ground protection for this site will involve the removal of minor planting to ground level by hand. After this laying geotextile fabric over the soil surface and an application of 200-300mm of coarse leaf mulch.

At the completion of the project all mulch and geotextile fabric is to be removed and natural ground level re-instated.

## 8 Qualifications and Experience

### TRISTAN BRADSHAW

Postal Address: PO Box 48 St Ives, NSW. 2075.

Mobile: 0411 608 001 Email: [info@bradshawtreeservices.com.au](mailto:info@bradshawtreeservices.com.au)

Industry Licence AL1286-1

### Professional Memberships

Member of the International Society of Arboriculture. No: 157768

Member of Arboriculture Australia No. 1286

### Qualifications

**2016-2018** Graduate Certificate in Arboriculture AQF8 at Melbourne University.

**2015** Tree Risk Assessment Qualification (TRAQ)

**2013-2014** Diploma of Arboriculture AQF5 at Ryde TAFE. Distinction

**2012** Certificate III in Arboriculture at Ryde TAFE

**2011** Certificate IV in Occupational Health and Safety

**2010** Aboriginal Sites Awareness Course by Aboriginal Heritage Office

**1996-1999** Bachelor of Horticultural Science at University of Sydney. Honours+

Tristan Bradshaw has been involved in the Horticultural and Arboricultural Industry since 1995. From a young age this was an interest and the business Bradshaw Horticultural Services incorporated Horticultural consulting work and landscaping. In 2000 Tristan undertook the Level 2 Arboriculture course at Ryde TAFE. The business progressively specialised in consulting, tree removal, pruning and stump grinding works. Extensive hands on knowledge was developed during the climbing of trees undertaking pruning or removal and during storm events understanding the tolerances of trees.

In 2009 the new business name Bradshaw Tree Services was registered to reflect works only being undertaken in the tree industry. The business operated throughout Sydney employing up to 25 people. Tristan Bradshaw's main role was as a consultant advising clients and writing reports. In 2019 Bradshaw Tree Services ceased operations and Tristan Bradshaw opened Bradshaw Consulting Arborists exclusively undertaking tree consultancy.

Tristan Bradshaw with continued education has attained a Level 8 qualification, attends the annual Arboriculture conferences taking part in the seminars to broaden his knowledge.

# Arboricultural Impact Assessment

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*This assessment was carried out from the ground and covers what was reasonably able to be assessed and available to this assessor at the time of inspection. No subterranean inspections were carried out. The preservation methods recommended where applicable are not a guarantee of the tree survival but are designed to reduce impacts and give the trees the best possible chance of adapting to new surroundings.*

**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 or the original report is referenced in, and directly attached to that submission, report or presentation.*

**Assumptions:**

*Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible: however, Bradshaw Consulting Arborists 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 tree/s that was/were examined and reflects the condition of the tree at the time of the assessment: and*
- The inspection was limited to visual examination of the subject tree without dissection, excavation, probing or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree may not arise in the future.*
- The assessment does not identify hazards and associated risk; this report is not a risk assessment.*

Yours sincerely,



Tristan Bradshaw (BHort Sci (USYD), Dip Arb AQF 5 (TAFE), Grad Cert AQF 8 (UMELB), TRAQ