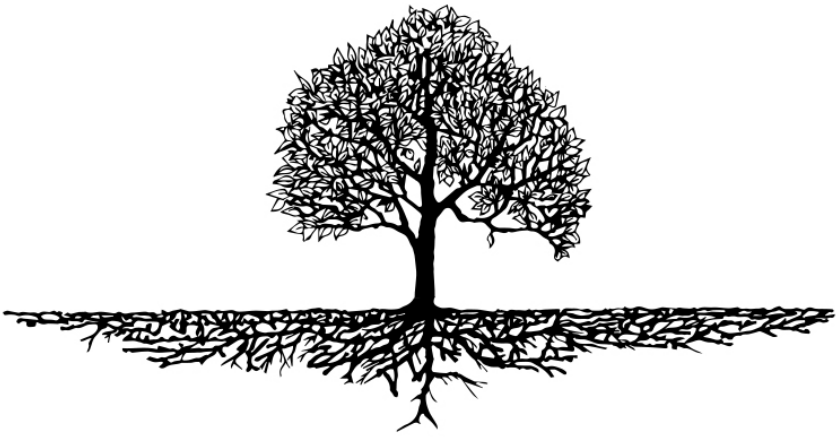
The Ents Tree Consultancy
ABN 95 598 933 136
theents@bigpond.net.au
P.O Box 6019 Marrickville NSW 2042
ph. 0422 265 128

Client	Mr & Mrs Owens
Location	23 Park Avenue Avalon
Document Type	Arboricultural Impact Assessment & Tree Protection Plan
Date	19th of November 2024



The Ents Tree Consultancy

Development Reports | Hazard Assessments | Tree Management

Hayden Coulter
The Ents Tree Consultancy
ABN 95 598 933 136

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1. Contents

2. Introduction

2.1 On the 15h of November 2024 Mr Owens engaged The Ents Tree Consultancy to complete an Arboricultural Impact Assessment and Tree Protection Plan for the trees on site at 23 Park Avenue Avalon. This report will assess the trees that are on and adjoining the site which may be impacted upon by the works or the associated activities. The client stated that the trees have been nominated to be inspected in relation to a development application which involves alterations and additions to the existing building and some landscape works. To allow the works to proceed none of the trees on site are proposed for removal. All of the significant trees on site and all trees adjoining the site are proposed to be retained and protected throughout the works. Consultation was sought with the client about the number and position of trees to be inspected prior to a survey being completed.

2.2 The site inspection of the nominated trees occurred 19th of November 2024. This tree report will detail the condition of the nominated trees, observe the proposed works and recommend removal or retention of the trees on or adjoining the site. Recommendations for removal or retention will be based on the proposed works and compatibility of the trees with the works as well as the trees hazard potential or ULE Rating. The report will also assess any potential impacts for trees nominated to be retained and attempt to remove or minimise them where possible. Recommended tree protection measures as set out in the Australian Standard AS4970 Protection of Trees on development sites will be nominated as required. The Northern Beaches Council DCP and LEP were considered when writing this document. The plans provided by the client were reviewed as part of the assessment process.

2.3 The purpose of this report is to assess the proposed works as well as the health and suitability of the trees nominated at the time of the inspection. The report will also provide tree management options for trees on the site in regard to the proposed works. This will include a pruning specification as required. The Tree Protection Guidelines will be discussed for all trees nominated to be retained. The information in this report will be based on the information presented by the client at the time of the inspection as well as the site inspection. The Australian Standard AS4970 Protection of Trees on Development Sites will be used as a guide to manage the site. Additional Tree Protection measures are included in appendix 8.

2.4 To achieve the objectives of the report, the trees will be assessed noting the species, size, general condition. The trees will be assessed using the internationally recognised VTA assessment method for above ground parts only. The trees characteristics and eventual size will be taken into consideration as will the trees position in relation to structures and hard scapes. Recommendations will be outlined in section 5 of the report. A detailed list of the trees surveyed will be provided in Appendix 2 of the report and an existing numerical system has been used to identify them for this report and future reference on this job site.

3. Methodology

3.1 The trees were assessed using the standard Visual Tree Assessment technique (VTA). The trees were assessed from the ground for this report.

3.2 A Lufkin 6.5m diameter tape was used to obtain the Diameter at breast height (DBH) as recommended at 1.4 metres unless otherwise stated due to variations in the trees form.

3.3 The height of the trees was estimated, and the spread of the trees canopy was paced out.

3.4 A Canon 5D Digital camera with a 24-105mm lens was used to take all photographs in this report.

3.5 The ULE rating system has been used as a guide to assist in determining the Useful Life Expectancy of the trees surveyed. Refer to Appendices 1.

4. Discussion

4.1 The trees nominated to be assessed are located on and adjoining the property at 23 Park Avenue Avalon. Some of the trees are significant in the immediate landscape and some may be considered important in the local areas landscape in terms of amenity and function. The trees are located on partially sheltered site with some protection from surrounding structures, trees and topography from some aspects. The soil on site appears to be a sandy loam that has been disturbed previously when the existing building and hardscapes were built, and the site was cleared.

4.2 Based on the information provided by the client, the proposed works involve alterations and additions to the existing building and some landscape works. Most of the trees on the site are proposed to be retained and all of the trees on the adjoining the sites will be retained and protected for the duration of the works. The trees nominated to be retained, will be retained using sympathetic building activities to allow the works to proceed. Options for the managing the trees nominated to be retained on and adjoining the proposed works site will be provided. Any tree that is nominated to be retained on or adjoining site will be kept in good condition for the duration of the works using the Australian Standard AS4970 2009 Protection of trees on development sites for the basis of all tree management practices.

4.3 **Trees 1 & 2** are maturing palm trees located to the rear of the site close to the proposed works. The trees are proposed to be retained as part of the works. There are limited disturbances proposed for structural root zone, however the palm trees can be retained with the root pruning highly unlikely to have any impact on the stability of the trees. The disturbance to the projected tree protection zones of these tree is less than 10% by area for the extension. This is a minor disturbance under the Australian Standard for the Protection of Trees on Development Sites AS4970. There are no long or short term impacts anticipated for these trees. If there are any issues with the palm trees, the trees can be removed as they are an exempt species on the northern beaches.

4.4 **Tree Protection Trees 1 & 2.** These trees will require trunk wraps and ground protection to protect the vascular tissue and roots from the works. The trunk wraps are to be installed around tree's trunk from ground level to 1.8m on the trunk prior to the works commencing. The trunk wraps should consist of a layer of padded material to protect the trees vascular tissue from damage. Vertical timber slats will be fastened to the padding using an adjustable strap or tightening mechanism. The timber slats must be approximately 1.8m in height for the trunk and if required, custom made for branches. The 1.8m timber slats will be approximately 50mm x 70mm and cover the trunk with a maximum spacing of 25mm. At no time should the timber slats or wire come in contact with the tree and no fixtures are permitted on the tree.

4.5 The ground protection is required to be installed prior to the commencement of any works activities will consist of a layer of geo-textile fabric covered in 100mm of mulch. The mulch will be covered by 100 x 50mm timber planks strapped together or 50mm thick sheets of plywood covering the tree protection zone of this tree, covering the works area. The AQF Level 5 Arborist will need to confirm in writing and approve all ground protection prior to its installation. This will allow for the works to proceed whilst protecting the tree. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.6 **Tree 3** is a mature tree located on the client's site to the rear of the property. There are no disturbances to the projected structural root zone. The disturbance to the projected tree protection zone is under 10%. This is a minor disturbance under the Australian Standard for the Protection of Trees on Development Sites AS4970. There are no long or short term impacts anticipated for this tree. **Tree Protection Tree 3.** This tree will require 1.8m chain mesh fencing to separate the tree's vascular tissue and root zone from the works on site. The tree protection zone will be shared with trees 4-10, making one large tree protection area to the rear of the site. If access is required within the tree protection area ground protection as listed in section 4.5 will be required to be installed prior to any works or access. The fencing will protect the tree's vascular tissue and roots on site from the proposed works whilst allowing for the works and access to the works. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.7 **Trees 4-8** are maturing trees located to the rear of the site away from the proposed works. The trees are proposed to be retained and protected as part of the works. There are no disturbances proposed for structural root zones or to the projected tree protection zones. This is considered a minor disturbance under the Australian Standard for the Protection of Trees on Development Sites AS4970. There are no long or short term impacts anticipated for these trees. **Tree Protection Trees 4 to 8.** These trees will require 1.8m chain mesh fencing to separate the tree's vascular tissue and root zones from the works on site. The tree protection zone will be shared with trees 3 and trees 9, 10, making one large tree protection area to the rear of the site. If access is required within the tree protection area ground protection as listed in section 4.5 will be required to be installed prior to any works or access. The fencing will protect the tree's vascular tissue and roots on site from the proposed works whilst allowing for the works and access to the works. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.8 **Tree 9** is a mature tree located to the rear of the site. The tree will have no disturbances to its projected structural root zone. The tree will have a minor disturbance to its projected tree protection zone of 10% of its rootzone disturbed. The disturbance will be for a cantilevered slab or pier and beam footing to lesson any potential impacts. There are no long or short term impacts anticipated for this tree. **Tree Protection Tree 9.** This tree will be protected by a 1.8m chain mesh fencing to protect is root zone and vascular tissue. The fencing will link up with trees 3-8 and tree 10 in combination with ground protection. The ground protection is required to be installed prior to the commencement of any works activities will consist of a layer of geo-textile fabric covered in 100mm of mulch. The mulch will be covered by 100 x 50mm timber planks strapped together or 50mm thick sheets of plywood covering the tree protection zone of this tree, covering the works area. The AQF Level 5 Arborist will need to confirm in writing and approve all

ground protection prior to its installation. This will allow for the works to proceed whilst protecting the tree. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.10 **Tree 10** is a mature tree located to the rear of the site. The tree will have limited disturbances to the trees projected structural root zone for the installation of a pier and beam footings or cantilever slab. There will be no long or short impacts to the trees stability. The tree will have a disturbance to its projected tree protection zone of 22% of its rootzone disturbed by area. The disturbance will be for a cantilevered slab or pier and beam footing which lesson any potential impacts on the tree making it closer to 10%. Based on personal experience, this species of tree can tolerate root pruning and disturbances to a moderate to high level. There are no long or short term impacts anticipated for this tree.

4.11 **Tree Protection Tree 10.** This tree will be protected by trunk wraps to protect the trees vascular tissue. The fencing for trees 3-9 will protect some of the tree's root zone, in combination with ground protection. The ground protection will be used in the TPZ for access and works areas. The ground protection is required to be installed prior to the commencement of any works activities will consist of a layer of geo-textile fabric covered in 100mm of mulch. The mulch will be covered by 100 x 50mm timber planks strapped together or 50mm thick sheets of plywood covering the tree protection zone of this tree, covering the works area. The AQF Level 5 Arborist will need to confirm in writing and approve all ground protection prior to its installation. This will allow for the works to proceed whilst protecting the tree. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.12 **Trees 11 & 12** are maturing palm trees located to the rear of the site close to the proposed works. The trees are proposed to be retained as part of the works. There are limited disturbances proposed for structural root zone, however the palm trees can be retained with the root pruning highly unlikely to have any impact on the stability of the trees. The disturbance to the projected tree protection zones of these tree is less than 10% by area for the extension. This is a minor disturbance under the Australian Standard for the Protection of Trees on Development Sites AS4970. There are no long or short term impacts anticipated for these trees. If there are any issues with the retention of the palm trees, the trees can be removed as they are an exempt species on the northern beaches.

4.13 **Tree Protection Trees 11 & 12.** These trees will require trunk wraps and ground protection to protect the vascular tissue and roots from the works. The trunk wraps are to be installed around tree's trunk from ground level to 1.8m on the trunk prior to the works commencing. The trunk wraps should consist of a layer of padded material to protect the trees vascular tissue from damage. Vertical timber slats will be fastened to the padding using an adjustable strap or tightening mechanism. The timber slats must be approximately 1.8m in height for the trunk and if required, custom made for branches. The 1.8m timber slats will be approximately 50mm x 70mm and cover the trunk with a maximum spacing of 25mm. At no time should the timber slats or wire come in contact with the tree and no fixtures are permitted on the tree.

4.14 The ground protection is required to be installed prior to the commencement of any works activities will consist of a layer of geo-textile fabric covered in 100mm of mulch. The mulch will be covered by 100 x 50mm timber planks strapped together or 50mm thick sheets of plywood covering the tree protection zone of this tree, covering the works area. The AQF Level 5 Arborist will need to confirm in writing and approve all ground protection prior to its installation. This will allow for the works to proceed whilst protecting the tree. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.15 **Trees 13 & 14** are in the position of the proposed works and are required to be removed. **Tree 15** is a maturing tree located to the rear of the site on the adjoining property. The tree will have no disturbances to the trees projected structural root zone for the installation of a pier and beam footings or cantilever slab. There will be no long or short impacts to the trees stability. The tree will have a disturbance to its projected tree protection zone of 10% of its rootzone disturbed by area. The disturbance will be for a cantilevered slab or pier and beam footing which lesson any potential impacts on the tree making it closer to 5%. There are no long or short term impacts anticipated for this tree.

4.16 **Tree Protection Tree 15.** This tree will be protected by 1.8m chain mesh fencing and ground protection to allow for access past the tree. The ground protection will be used in the TPZ for access and works areas. The ground protection is required to be installed prior to the commencement of any works activities will consist of a layer of geo-textile fabric covered in 100mm of mulch. The mulch will be covered by 100 x 50mm timber planks strapped together or 50mm thick sheets of plywood covering the tree protection zone of this tree, covering the works area. The AQF Level 5 Arborist will need to confirm in writing and approve all ground protection prior to its installation. This will allow for the works to proceed whilst protecting the tree. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.17 **Tree Group 16** is a mature stand of palm trees located to the side of the site on the boundary. The trees will have no disturbances to their projected structural root zones or tree protection zones based on the plans provided by the client. The client has stated that there will be no access or works around these trees. **Tree Protection Tree Group 16.** No tree protection will be required for these trees if the area is fenced off at the front and the rear for trees 1 & 2 as well as tree 17. If access is required past these trees, the trees will be protected by 1.8m chain mesh fencing in combination with ground protection. The ground protection is required to be installed prior to the commencement of any works activities will consist of a layer of geo-textile fabric covered in 100mm of mulch. The mulch will be covered by 100 x 50mm timber planks strapped together or 50mm thick sheets of plywood covering the tree protection zone of this tree, covering the works area. The AQF Level 5 Arborist will need to confirm in writing and approve all ground protection prior to its installation. This will allow for the works to proceed whilst protecting the tree. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.18 **Tree 17** is a maturing tree located to the front of the site away from the works. The tree will have no disturbances to the trees projected structural root zone and will have no disturbance to its projected tree protection zone. There are no long or short term impacts anticipated for this tree. The client has stated that there will be no access past the tree.

4.19 **Tree Protection Tree 17.** If there is no access past the tree a 1.8m chain mesh fence can be installed to separate the tree from vehicular movements on the client's driveway which protects the roots. If access is required past the tree, the tree will need to be protected by 1.8m chain mesh fencing and ground protection. The ground protection will be used in the TPZ where the driveway is not present for access to the works areas. The ground protection is required to be installed prior to the commencement of any works activities will consist of a layer of geo-textile fabric covered in 100mm of mulch. The mulch will be covered by 100 x 50mm timber planks strapped together or 50mm thick sheets of plywood covering the tree protection zone of this tree, covering the works area. The AQF Level 5 Arborist will need to confirm in writing and approve all ground protection prior to its installation. This will allow for the works to proceed whilst protecting the tree. At no time should the tree protection material be removed during the works period. Refer to the tree protection plan in appendix 4a.

4.20 **Trees 18 to 22.** These trees are grouped together at the front of the property, away from the works. These trees are proposed to be retained and protected for the duration of the works. There are no disturbances to the projected structural root zones or tree protection zones of these trees of these trees. There are no long or short term impacts for these trees. **Tree Protection Trees 18 to 22.** The existing driveways will protect the tree's root zones from any access. To protect the trees vascular tissue, 1.8m chain mesh fencing can be utilised or trunk wraps. The trunk wraps are to be installed around tree's trunk from ground level to 1.8m on the trunk prior to the works commencing. The trunk wraps should consist of a layer of padded material to protect the trees vascular tissue from damage. Vertical timber slats will be fastened to the padding using an adjustable strap or tightening mechanism. The timber slats must be approximately 1.8m in height for the trunk and if required, custom made for branches. The 1.8m timber slats will be approximately 50mm x 70mm and cover the trunk with a maximum spacing of 25mm. At no time should the timber slats or wire come in contact with the tree and no fixtures are permitted on the tree. Refer to the tree protection plan in appendix 4a.

4.21 **Trees 23 to 26.** These trees are maturing council street trees grouped together at the front of the property, away from the works. These trees are proposed to be retained and protected for the duration of the works. There are no disturbances to the projected structural root zones or tree protection zones of these trees of these trees. There are no long or short term impacts for these trees. **Tree Protection Trees 23 to 26.** The existing driveways will protect part of the tree's root zones from any access. To protect the trees vascular tissue and the remaining root zones, 1.8m chain mesh fencing will be required. The fencing will be installed at the edge of the driveway, along the front boundary, along the gutter, covering the TPZ separating the trees from the works. Refer to the tree protection plan in appendix 4a.

5. Recommendations

5.1 After reviewing the site and the information provided by the client, the works are proposed to proceed with the following actions,

5.2 Trees 13 & 14 are proposed to be removed as they are in the position of the works. The canopy cover provided by these trees can be replaced within the new landscape plan. Trees 1 to 12 and trees 15 to 26 are proposed to be retained and protected for the duration of the works.

5.3 It is recommended that all tree protection measures are in place as described in section 4 of the report prior to the commencement of any works. All alterations and additions will need to be approved in writing by the AQF level 5 site Arborist. Any works within the structural root zone of any of the trees on site must be completed by hand and supervised by the AQF Level 5 Site Arborist.

5.4 All root pruning of roots 50mm+ on site will need to be completed by the AQF level 5 Site Arborist. No machinery access is permitted within the Tree Protection zone of any tree. It is recommended that monthly inspections are completed by the AQF Level 5 Site Arborist to monitor the condition of the trees on site and ensure the tree protection is in place. This should occur at monthly intervals. At the end of the works period the tree will be inspected by an AQF 5 Arborist to determine if the tree has been maintained adequately. If this is done the compliance certificate will be issued. If trees have been damaged or breaches of the Australian Standards have occurred council will be contacted for further advice.

5.5 It is recommended that construction proceeds using the Australian Standard AS4970 2009 Protection of trees on development sites as a basis for tree protection on the site as well as the site-specific instructions listed in section 5 of this report. Additional Tree Protection measures are listed in Appendix 7 of the report to assist in the care of the trees on site.

Please do not hesitate to call 0422 265 128 if you have any questions regarding the contents of this report.

Regards

Hayden Coulter

AQF Level 8 Graduate Certificate in Arboriculture
AQF Level 5 Consulting Arborist
AQF Level 4 Advanced Certificate in Urban Horticulture

Disclaimer
All trees have been assessed based on the information and facts of the site and as presented by the client or relevant parties at the time of inspection. No responsibility can be taken for incorrect or misleading information provided by the client or other parties. The nominated tree/s are assessed for biological requirements and hazard potential with reasonable care. The trees are assessed from the ground and by visual means only unless otherwise stated. All tree protection and tree preservation measures are designed to minimise the damage to the tree/s or to reduce the hazard potential of the tree/s. No responsibility can be taken by the author of this report for future damage to structures by the existing trees or planted trees. Trees are inherently dangerous, therefore will always have a hazard potential. Trees fail in ways that are not predictable or fully understood. There is no guarantee expressed or implied that failure or deficiencies may not arise of the subject trees in the future. No responsibility is accepted for damage to property or injury/death caused by the nominated tree/s.

The Ents Tree Consultancy. ABN: 95 598 933136 theents@bigpond.net.au

Appendix 1 ULE Rating

Useful Life Expectancy (ULE): Useful life expectancy refers to an expected period of time the tree can be retained within the landscape before its amenity value declines to a point where it may detract from the appearance of the landscape and/or becomes potentially hazardous to people and/or property. ULE values consider tree species, current age, health, structure and location. ULE values are based on the tree at the time of assessment and do not consider future changes to the tree's location and environment which may influence the ULE value.

Category rating:	Category definition in years:	Category rating:
1	> 40 Years	High
2	15 to 40 Years	Medium
3	5-15 Years	Low
4	0-5 Years	Dead / Dying

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Appendix 2 Assessment of Trees

Tree No	Species	Height (m)	DBH* & DAC**	Canopy Spread (m)	TPZ ***	Health #	Structure #	ULE Rating ****	Landscape Rating *	Stars Rating *	Observations and comments
1	*Archontophoenix cunninghamiana* Bangalow Palm	14	.25 DAC .35	6	3 SRZ 1.5	A	A	2	M	M	
2	*Archontophoenix cunninghamiana* Bangalow Palm	16	.25 DAC .35	6	3 SRZ 1.5	A	A	2	M	M	
3	*Lophostemon confertus* Brush Box	17	.70 DAC .85	10	8.5 SRZ 3.1	A	A	2	H	H	
4	*Melaleuca quinquenervia* Paper Bark	14	.30 DAC .40	7	3.6 SRZ 2.25	A	Ba	2	M	M	
5	*Melaleuca quinquenervia* Paper Bark	16	.50 x 2 DAC .65	8	7.5 SRZ 2.75	A	Ba	2	H	H	
6	*Melaleuca quinquenervia* Paper Bark	15	.45, .30 DAC .50	8	6 SRZ 2.5	A	Ba	2	H	H	
7	*Callistemon salignus* White Bottle Brush	6	.20 x 2 DAC .35	5	4 SRZ 2.15	A	Ba	2	M	M	
8	*Glochidion ferdinandi* Cheese Tree	7	.20 DAC .30	6	2.4 SRZ 2	A	A	2	M	M	
9	*Melaleuca quinquenervia* Paper Bark	14	.65 DAC .75	8	8 SRZ 3	A	A	2	H	H	
10	*Callistemon salignus* White Bottle Brush	12	.36, .40 DAC .63	8	7.5 SRZ 2.85	A	A	2	M	M	
11	*Archontophoenix cunninghamiana* Bangalow Palm	11	.20 DAC .30	6	3 SRZ 1.5	A	A	2	M	M	
12	*Archontophoenix cunninghamiana* Bangalow Palm	12	.20 DAC .30	6	3 SRZ 1.5	A	A	2	M	M	
13	*Archontophoenix cunninghamiana* Bangalow Palm	11	.20 DAC .30	6	3 SRZ 1.5	A	A	2	M	M	
14	*Archontophoenix cunninghamiana* Bangalow Palm	9	.20 DAC .30	6	3 SRZ 1.5	A	A	2	M	M	

Explanatory Notes for Table

- *Dbh = Diameter of trunk at breast height.
- ** DAC = Diameter above the root collar used to measure the Structural Root Zone (SRZ).
- ***TPZ is the recommended TPZ 12x the DBH at 1.4m, SRZ is the trees structural root zone. Refer to AS4970 for details.
- **** ULE Explanation can be found in Appendix 1.
- + IACA Landscape value and S.T.A.R.S Rating system. Refer to Appendix 5
- # Health and Structure values represented above are P = poor, BA = Below Average, A = Average, G = Good.

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Tree No	Species	Height (m)	DBH* & DAC**	Canopy Spread (m)	TPZ ***	Health #	Structure #	ULE Rating ****	Landscape Rating *	Stars Rating *	Observations and comments
15	*Angophora costata* Smooth Barked Apple	7	.10, .15 DAC .30	6	3.5 SRZ 2	A	A	2	M	M	A small misshapen tree with decay at the base on the adjoining property.
16	*Archontophoenix cunninghamiana* Bangalow Palm	6	.20 DAC .30	5	3 SRZ 1.5	A	A	2	M	M	A group of palm trees away from the works.
17	*Angophora costata* Smooth Barked Apple	14	.39 DAC .50	10	5 SRZ 2.5	A	A	2	H	H	This tree is located to the front of the site away from the works.
18	*Liquidambar styraciflua* Liquidambar	12	.45 DAC .55	10	5.5 SRZ 2.6	A	A	2	M	M	This tree is located to the front of the site away from the works.
19	*Pittosporum undulatum* Native Daphne	7	.15 DAC .20	4	2 SRZ 1.7	Ba	Ba	3	L	L	This tree is located to the front of the site away from the works.
20	*Angophora costata* Smooth Barked Apple	14	.60 DAC .70	12	7.2 SRZ 2.85	A	A	2	H	H	This tree is located to the front of the site away from the works.
21	*Eucalyptus piperita* Sydney Peppermint	14	.35 DAC .45	8	4.2 SRZ 2.35	A	A	2	H	H	This tree is located to the front of the site away from the works.
22	*Lophostemon confertus* Brush Box	12	.37 DAC .45	10	4.5 SRZ 2.35	A	A	2	H	H	This tree is located to the front of the site away from the works.
23	*Angophora costata* *Smooth Barked Apple*	12	.62 DAC .75	12	7.5 SRZ 3	A	A	2	H	H	This tree is located to the front of the site away from the works.
24	*Eucalyptus piperita* Sydney Peppermint	7	.25 DAC .35	5	3 SRZ 2.15	Ba	P	2	L	L	This tree is located in the nature strip to the front of the site away from the works.
25	*Angophora costata* *Smooth Barked Apple*	14	.39 DAC .50	10	5 SRZ 2.5	A	A	2	H	H	This tree is located in the nature strip to the front of the site away from the works.
26	*Angophora costata* *Smooth Barked Apple*	12	.45 DAC .55	10	5.5 SRZ 2.6	A	A	2	M	M	This tree is located in the nature strip to the front of the site away from the works.

Explanatory Notes for Table

- *Dbh = Diameter of trunk at breast height.
- ** DAC = Diameter above the root collar used to measure the Structural Root Zone (SRZ).
- ***TPZ is the recommended TPZ 12x the DBH at 1.4m, SRZ is the trees structural root zone. Refer to AS4970 for details.
- **** ULE Explanation can be found in Appendix 1.
- + IACA Landscape value and S.T.A.R.S Rating system. Refer to Appendix 5
- # Health and Structure values represented above are P = poor, BA = Below Average, A = Average, G = Good.

Appendix 3 Images of Tree



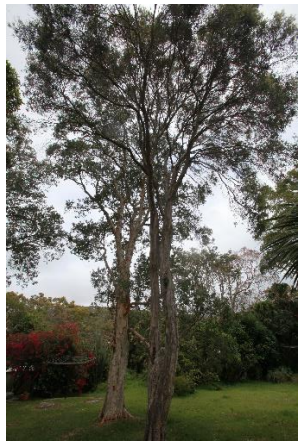

Image 1 above left shows trees 1-3 to the rear of the site. Image 2 above left centre shows trees 4-8 to the rear of the stie. Image 3 above centre shows trees 9 & 10 to the rear of the house. Image 3 above right centre shows trees 11-15 to the rear of the site. Image 5 above right shows tree group 16. Image 6 below left shows tree 17 to the front of the site. Image 7 below centre shows trees 18-22 to the front of the site away from the works. Image 8 below right shows trees 23-26 on the council nature strip away from the works.



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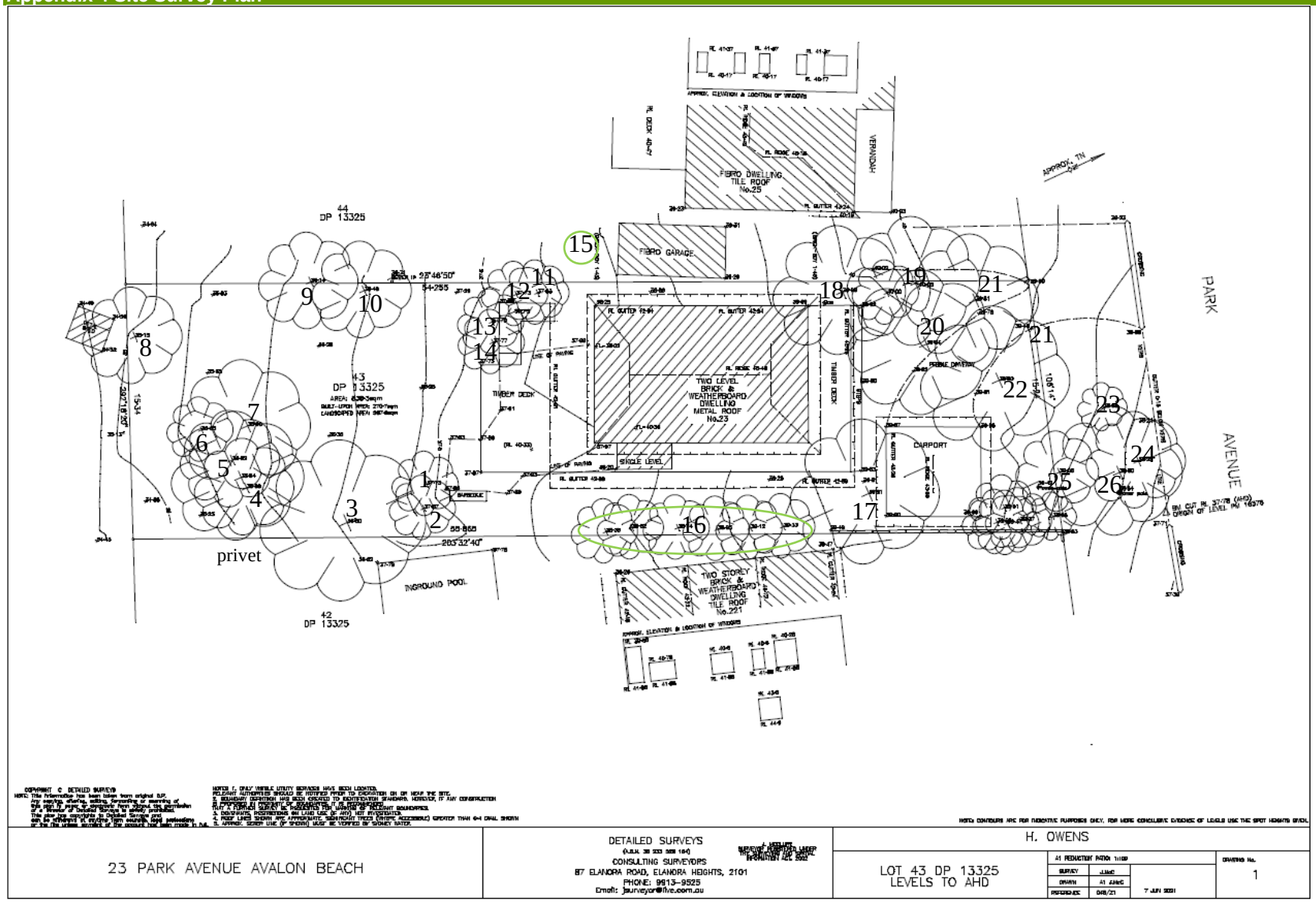
Appendix 4 Site Survey Plan



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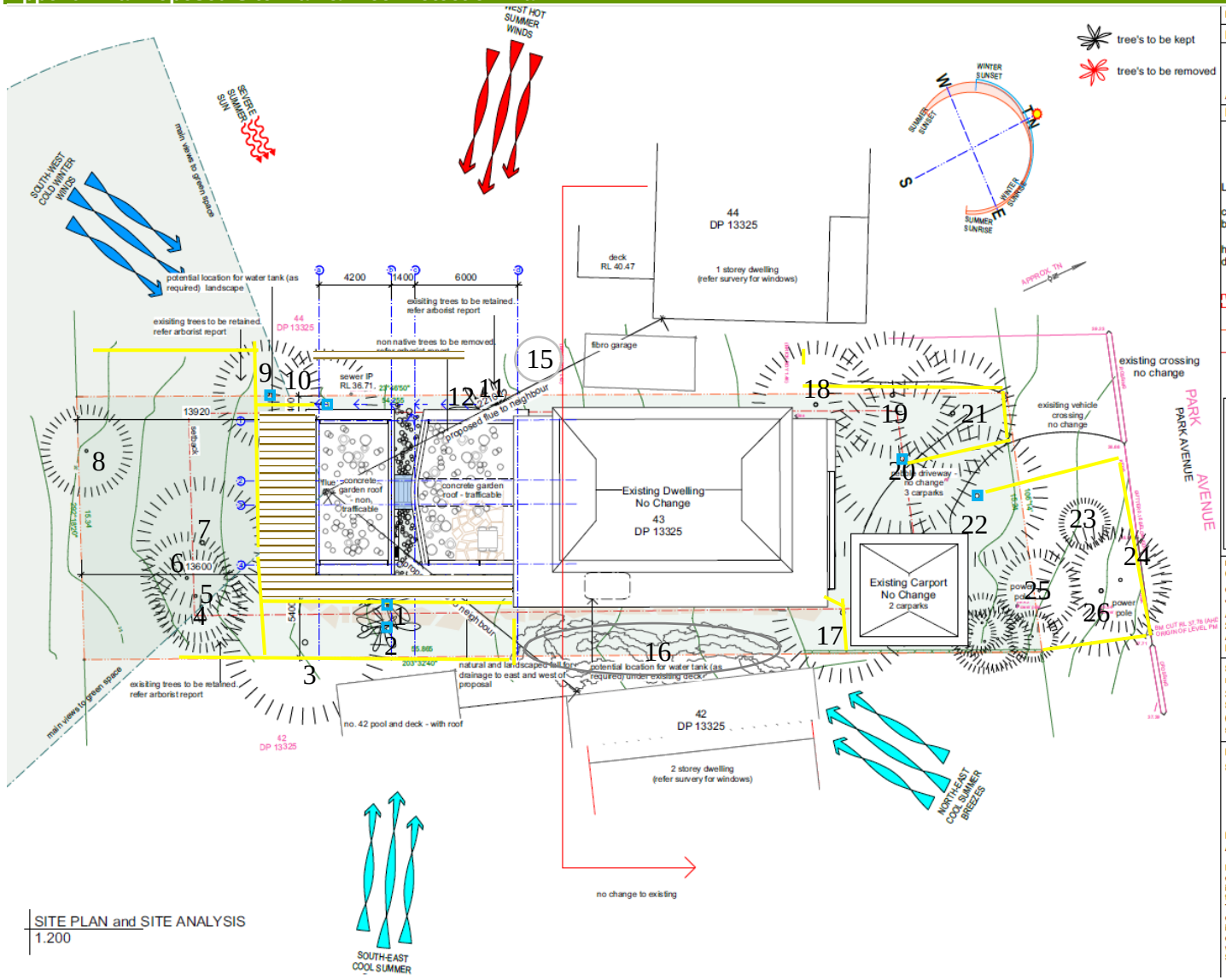
ABN 95 598 933 136

Appendix 4a Proposed Site Plan & Tree Protection Plan



PLOT DATE : 18/12/24

DRAWING ISSUE

A DA CONSULTANTS 18/12/24

NOTES

LEGEND

conc	concrete
bw-r	block work-rendered/ bagged
hw	hardwood timber
dp	down pipe

demolition
boundary
setback

LANDSCAPED AREA

site area:
838.3 sqm (as per survey)

exisiting impervious area:
258.85 sqm 31% - 69% pervious exisiting

exisiting + proposed impervious area:
324 sqm 38% - 61% pervious proposed

Project
Garden Cubby

Client
Jess and Andy Owens

Address
23 Park Avenue
Avalon Beach
NSW 2107

SOBI WING SLINGSBY ARCHITECT
nsw reg. 11690
37 Richard Road, Scotland Island
Sydney, NSW 2105
0413 459 015
sobi.slingsby@icloud.com

Drawn By:SS
Scale:1:200 at A3

Drawing
site plan + analysis

Rev. A
Dwg No. DA 100

1.8m Chain mesh fencing
1.8m trunk wraps.
Ground Protection.
Tree not present.

Appendix 4b Illustrations of Tree Protection

Figure 1

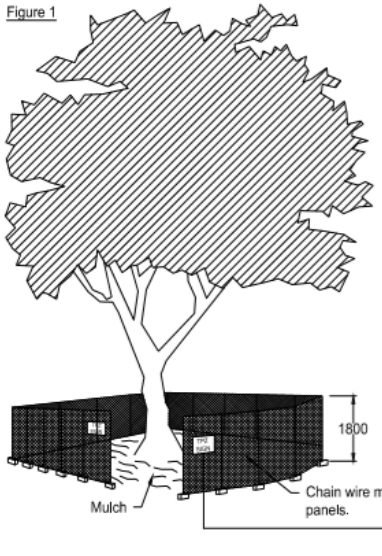


Figure 1 Notes:
1. 1.8 metre tree protection fence to be chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2. Alternative plywood or wooden paling fence panels can be used. This fence material also prevents buildings materials or soil entering the TPZ.
3. Mulch installation across surfaces of TPZ (at the discretion of the Project Arborist).

Figure 2

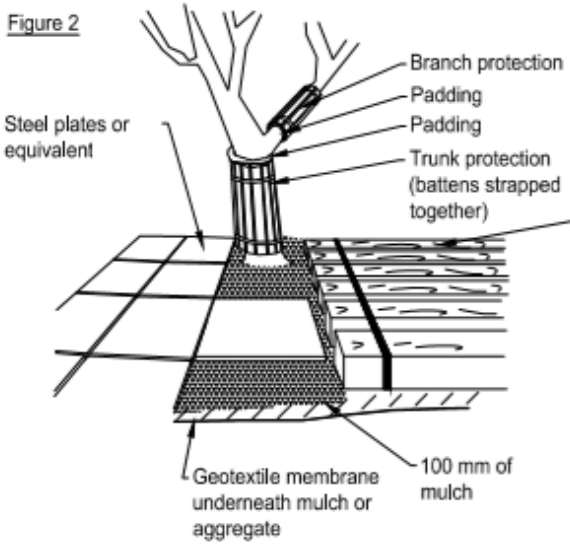


Figure 2 Notes:
1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

Figure 3

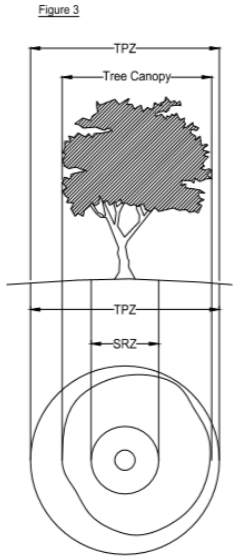


Figure 1 above left shows an example of a Tree Protection Zone using 1.8m chainmesh fence panels to isolate the tree from the works site, refer to The Australian Standard for the Protection of Trees on Development Sites AS4970.

Figure 2 above centre shows an example of trunk and branch protection in combination with ground protection to be installed as an alternative to 1.8m chainmesh fenceing, refer to The Australian Standard for the Protection of Trees on Development Sites AS4970.

Figure 3 above right shows an example of the projected structural root zone and tree protection zone refer to The Australian Standard for the Protection of Trees on Development Sites AS4970.

Appendix 5 Legend for S.T.A.R.S matrix assessment

IACA Significance of a Tree, Assessment Rating System (STARS) ©
(IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

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.

Tree Significance - Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vigour.
- The tree has a form typical for the species.
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age.
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register.
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity.
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values.
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vigour.
- The tree has form typical or atypical of the species.
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape

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

Environmental Pest / Noxious Weed Species

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

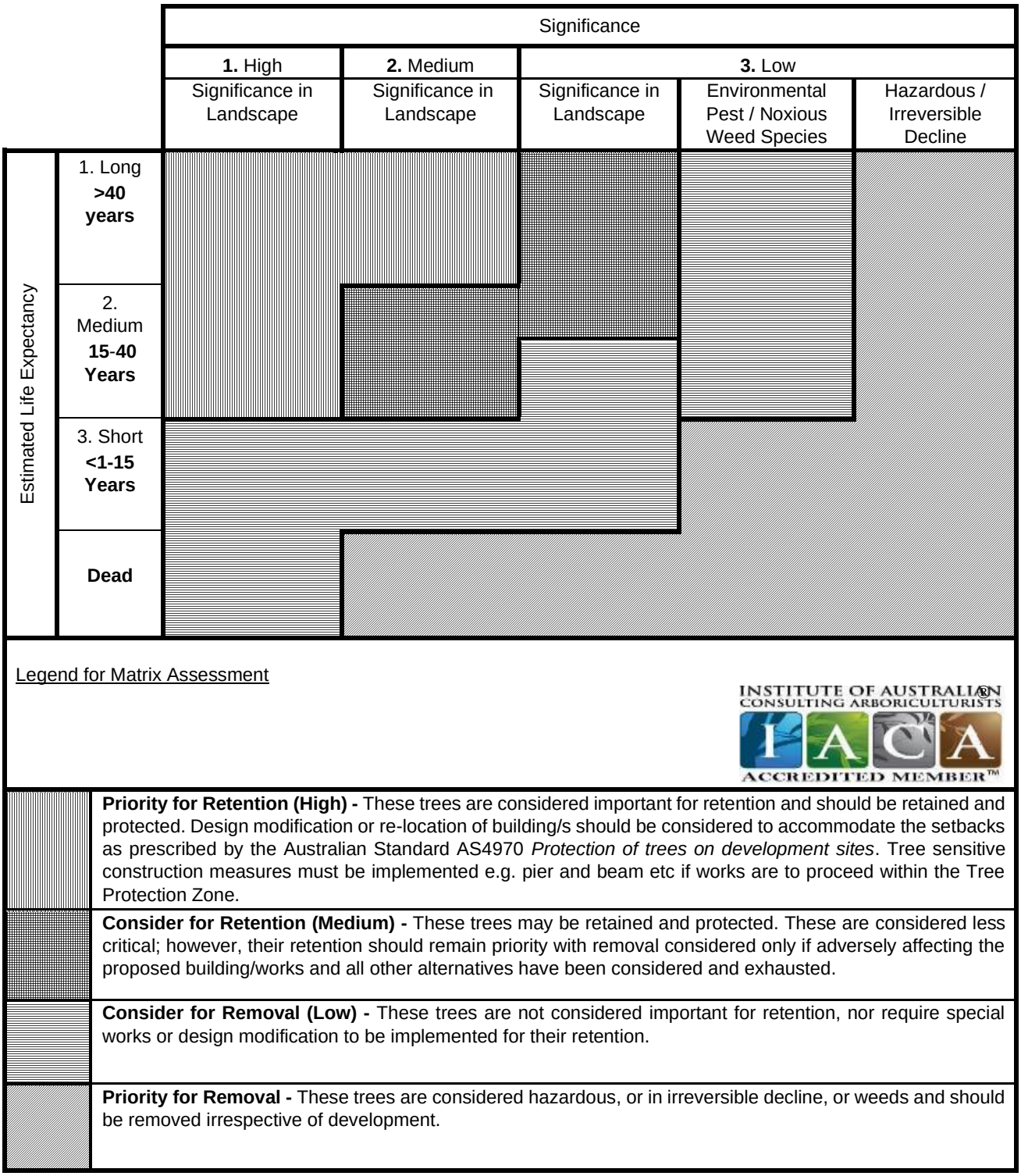
Hazardous/Irreversible Decline

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

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 monocultural stand in its entirety e.g. hedge.

Table 1.0 Tree Retention Value - Priority Matrix.



Legend for Matrix Assessment

	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 *Protection of trees on development sites*. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.
	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.
	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.
	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

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

Appendix 6 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

Harris, R. W; Clark, J.R; & Matheny, N.P (2004). *Arboriculture:* Integrated Management of Landscape Trees, Shrubs & Vines 4th Edition, Prentice Hall, New Jersey

Shigo, A.L. (1986). *A New Tree Biology*. Shigo & Trees, Associates, Durham, New Hampshire

Hadlington, P. & Johnston, J. (1988). *Australian Trees: Their Care & Repair. University of NSW Press, Kensington*

Lonsdale, D. (1999). *Principles of Tree Hazard Assessment & Management.* Forestry Commission, The Stationery Office, London

Mattheck, C. & Breloer, H. (1994). *The Body Language of Trees.* Research for Amenity Trees No.4. The Stationery Office, London

Appendix 7 Glossary of Terms

Abiotic	Nonliving
Anthracnose	a fungal disease causing dead areas on the leaves, buds, stems.
Arboriculture	The science and art of caring for trees, shrubs and other woody plants in landscape settings.
Barrier Zone	Protective boundary formed in new wood in response to wounding or other injury.
Biotic	Alive, pertaining to living organisms.
Branch attachment	The structural union of a lateral branch.
Callus	Undifferentiated tissue produced in response to wounding.
Canker	A dead spot or necrotic lesion that is caused by a bark inhabiting organism/pathogen.
Cavity	an open wound characterized by the presence of decay resulting in a hollow.
Collar	the ring of tissue that surrounds the lateral branch at its point of attachment.
Compartmentalization	A physiological process that creates the chemical and physical boundaries that act to limit the spread of disease and decay organisms.
Compression wood	A type of reaction wood that forms on the underside of branches which tends to maintain a branch angle of growth.
Crown	The above ground parts of the tree, including the trunk.
DBH	The diameter of a tree's trunk measured at 1.4m.
Decay	Process of degradation of woody tissues by fungi and bacteria through the decomposition of cellulose and lignin.
Decline	Progressive decrease in health of organs or the entire plant usually caused by a series of interacting factors.
Drip line	The width of the crown, as measured by the lateral extent of the foliage.
Epicormic shoot	a shoot that arises from latent or adventitious buds that occur on stems, branches or the bases of trees.
Included bark	Pattern of development at branch junctions where bark is turned inward, rather than pushed out; contrast with the branch nark ridge.
Mortality Spiral	The sequence of events describing a change in the trees health from vigorous to declining to death.
Photosynthesis	The transformation in the presence of chlorophyll and light, of carbon dioxide from (the air) and water (primarily from soil) into a simple carbohydrate and oxygen.
Pruning	systematic removal of branches of a plant usually a woody perennial.
Reaction wood	Specialized secondary xylem that develops in response to a lean or similar mechanical stress to restore the stem to vertical.
Taper	The change in diameter over the length of trunks and branches. Important to mechanical support.
Tension wood	A type of reaction wood that trees form on the upper side of branches and stems and roots.
VTA	Visual Tree Assessment is a method of evaluating structural defects and stability in trees.
Wound	Any injury that induces a compartmentalization response.

Appendix 8, The Ents Tree Consultancy Tree Protection Guidelines

Definitions

a) **Tree Protection Zone (TPZ),** The TPZ is divided into 2 areas. 1 The Structural Root Zone delineated by an area nominated in table section 4 of the report and is assumed to contain most structural roots. The Tree Protection Zone that is twelve times the diameter of the tree trunk which is used to gauge the amount of feeder roots. No machinery works are permitted in these areas unless specified in this report or without written approval from the Council or the Arborist employed for this job site.

b) **Qualified Arborist**, for supervision of works and reports level 5. For carrying out tree works level 3 Levels are as recognised by the Australian training framework.

Standards, AS4970 2009, Protection of Trees on development sites. AS 4373: 1996, The pruning of amenity trees.

Tree Protection Generally

1. Prior to works commencing erect a 1800mm chain mesh fence to protect the trees trunk at 12x Dbh or as specified in this report. The Tree Protection Zones as nominated should be marked with line marking paint and observed as an area free from machinery for the duration of the works unless stated otherwise in the accompanying report. Do not remove, alter or relocate without the approval of the Council or the Arborist employed for this site.

2. Trees to be protected in the works contract are items entrusted to the Contractor /owner by the Council for carrying out the work under the Contract. The Contractor/owner has obligations to protect these trees as part of the care of the work in the contract conditions.

3. Prior to commencing work on Site confirm with the Council all trees to be protected for the duration of the Works. Confirm also all access and haulage routes, storage areas, tree protection measures and work procedures. Ensure that the protection measures are in place prior to commencing work.

4. Use suitably qualified Arborist (level 5) to supervise earthworks or activities within the Structural Root Zone of tree, Do not severe roots 50mm or greater, which may cause damage to or affect the health of trees. Pruning of trees by the contractor is not permitted. If pruning works are required a suitably qualified (Minimum level 3) arborist will complete all works in the crown. All root pruning must be completed and documented by the level 5 site arborist.

5. Ensure construction trailers, vehicles and equipment do not come in contact with any tree at any time. Do not locate storage areas within the nominated Tree Protection Zone. Do not deposit or store materials, spoil, contaminants, and waste or washout water within Tree Protection Zones.

6. Take all reasonable precautions to protect trees to be retained on site from damage and decline, maintaining their health during the Contract. Implement recognised best practice industry standards to satisfy horticultural requirements for tree care.

7. Assess and monitor water stress in relation to trees on site. This is of particular importance if earthworks have occurred. Apply sufficient water to the trees on site as required to keep the trees healthy. Immediately report to the Council and site arborist, any trees on site that are injured, damaged or are in decline.

NOTE: Failure to comply with any part of these tree protection guidelines or the Australian standard AS4970 or AS4373 will result in the party breaching the Tree Protection Guidelines taking responsibility for all associated consequences.

Appendix 9 Curriculum Vitae

Education and Qualifications

- 2019 Graduate Certificate in Arboriculture Melbourne University (AQF Level 8), 1st Class Honours.
- Arboriculture Australia 3 Day Tree Anatomy Workshop 2015
- QTRA basic certificate 2014, QTRA Advanced Certificate 2016
- TRAQ Qualification 2014
- 2005 Diploma of Arboriculture (AQF Cert 5), Ryde TAFE. Distinction Pass.
- Barrell Tree Care Workshop- Trees on Construction Sites (Brisbane 2005)
- Tree Logic seminar- Urban Tree Risk Management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar Sydney (2004)
- Excelsior Training Claus Mattheck (Sydney 2001)
- 2000 Tree Climbing Course (AQF Cert 2), Ryde TAFE.
- 1999 Advanced Certificate in Urban Horticulture, (AQF Cert 4), Ryde TAFE. Distinction Pass.
- 1995 Greenkeepers Trade Certificate (AQF 3) Ryde TAFE. Credit Pass.
- 1991 Higher School Certificate.

Professional Membership Accreditation

- Institute of Australian Consulting Arborists ACM 0482014
- Arboriculture Australia Member number 2527

Presentation of Scientific Papers

- Managing Mature Trees NAAA (Sydney 2000), Presented a Paper “Habitat Value of Mature Trees”

Industry Experience

- **2004 to Date, Sole Trader, The Ents Tree Consultancy.** Writing of tree reports for development applications, master plans, hazard evaluations, tree management plans and expert witness reports. Hazard assessments, tree surveys and consultations. Clients include The Royal Botanic Gardens Sydney, UNSW Master Planning Works including SIRF building, Tyree Building, DP sports field redevelopment, Sydney University Mays Green Precinct, Taronga Zoo Coastline Precinct, Capital Insight, Campbelltown Hospital Redevelopment, Parramatta Park Trust multiple jobs, Woollahra Council multiple jobs and many other jobs.
- **2003 to 2008, Arborist University of New South Wales**. Survey all trees on site, developed a Tree Management Database. Minimise hazard potential of all trees on site through evaluation and works. Generate and prioritise works and tree assessment-based areas usage, tree conditions and staff required. Development of UNSW Tree Protection Guidelines for master planning works. Acting Supervisor December 2006 to May 2007.
- **2003 Tree management Officer Randwick Council**. Liaise with public to explain and enforce the councils Tree Preservation order. Management of internal staff and contractors. Project management and co-ordination of street tree planting and maintenance.
- **1999 to 2003 Animal Food Production Manager and Arborist.** Management of Koala Food Plantation, Management of animal food supply registry for herbivores/omnivores. Coordination of staff contractors and volunteers. Maintain and manage tree management database, complete tree works within zoo grounds and at zoo owned plantations. Acting supervisor 6-month period 2002 for grounds department and asset management trade team.