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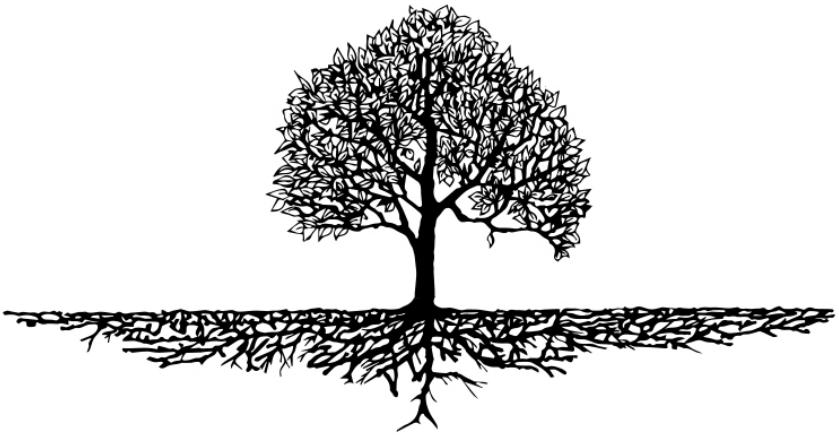
Client	Mr Uppal
Location	49 Forest Way Frenches Forest
Document Type	Arboricultural Impact Assessment & Tree Protection Plan
Date	22nd of September 2023



The Ents Tree Consultancy

Development Reports | Hazard Assessments | Tree Management

Hayden Coulter
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Client	Mr Uppal
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1. Contents

2. Introduction

2.1 On the 20th of September 2023 Mr Uppal engaged The Ents Tree Consultancy to complete an Arboricultural Impact Assessment and Tree Protection Plan for the trees on and adjoining the site 49 Forest Way Frenches Forest. This report will assess the trees that are on and adjoining the site which may have been 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 the construction of a new building and some landscape works. The house will be separated with the front yard, meaning only the rear yard will be a construction site. Consultation was sought with the clients representative 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 22nd of September 2023. This tree report will detail the condition of the nominated trees, observe the proposed works, reducing impacts wherever possible and assess the level of disturbance for each tree. The assessment of any proposed works will also be assessed for potential impacts. Recommendations for removal or retention will be based on the proposed works as well as the compatibility of the trees with the works. 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 Architecture Insight were reviewed as part of the assessment process.

2.3 The purpose of this report is to assess the proposed works and the impacts the works will have on the existing trees. The report will also consider management options to reduce all anticipated impacts on the trees nominated to be retained. The report will also provide tree management options to protect the trees throughout the proposed works. 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 their 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 past works, services and structures. The level of disturbance will be considered as will the trees stability. 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. No root mapping, aerial assessments or specialised diagnostic testing will be completed for the purpose of the report.

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 49 Forest Way Frenches Forest. 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 established.

4.2 Based on the information provided by the client, the proposed works involve the construction of a new building with some landscape works. The house will be separated with the front yard, meaning only the rear yard will be a construction site. It appears that some of the trees on the site and all trees on the adjoining sites will be retained. 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 **Tree 1** is a mature council street tree located to the north of the clients site close to the entry and exit point of the proposed works. Due to the trees position, there will be no disturbances to its projected tree protection zone or structural root zone. This tree has been included I the report as it will be close to the main access point and tree protection will be required. **Tree Protection Tree 1.** To protect the vascular tissue and the trees root zone, 1.8m chain mesh fencing will be required to be installed covering the tree protection zone in the areas on site whilst allowing access past the tree. The fencing should run from the gutter to the driveway and to the edge of the TPZ to the west. The fencing should allow a 1m path for access past the tree. This will allow for the works to be completed, whilst separating the tree from the works. Refer to the tree protection plan in appendix 4a.

4.4 **Trees 2 to 5** are council street trees located to the north of the site on the adjoining property close to the works. These trees are proposed to be retained and protected for the duration of the works. There are no disturbances within the structural root zone of these trees. There are no disturbances to the projected tree protection zones of these trees for works. There will be access required over the trees root zones so ground protection will be required. There are no long, or short-term impacts anticipated for these trees. **Tree Protection Trees 2 to 5.** The existing fences will protect the trees vascular tissue from the works inside, however chain mesh fencing should be installed to separate the trees from delivery vehicles whilst allowing for continuing pedestrian access.

4.5 To protect the trees root zone ground protection will be required. Ground protection will be required to allow for access whilst preventing compaction. 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. 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 **Trees 6 to 8** are semi-mature trees located to the south of the site on the adjoining property close to the works. These trees are proposed to be retained and protected for the duration of the works. There are no disturbances within the structural root zone of these trees. There are no disturbances to the projected tree protection zones of these trees for works. There will be access required over the trees root zones so ground protection will be required. There are no long, or short-term impacts anticipated for these trees.

4.7 **Tree Protection Trees 6 to 8.** The existing fences will protect the trees vascular tissue from the works. To protect the trees root zone ground protection will be required. Ground protection will be required to allow for access whilst preventing compaction. 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. 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.

4.8 **Tree 9** is a mature tree located on the adjoining property to the north of the site, close to the works. This tree is proposed to be retained and protected for the duration of the works. There are no disturbances within the structural root zone. No grading of the ground or level changes of any kind are permitted. The disturbance to the trees projected tree protection zone is 20% by area. This is a high level of disturbance according to the Australian Standard for The Protection of Trees on Development Sites AS4970. This tree species can tolerate root pruning but is less tolerant of fill. There are no long, or short-term impacts anticipated for this tree.

4.9 **Tree Protection Tree 9.** The existing fence will protect the trees vascular tissue. The tree will require ground protection to protect the trees roots. To protect the trees root zone ground protection will be required. Ground protection will be required to allow for access whilst preventing compaction. 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. 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 maturing tree located to the north of the site close to the works. This tree is proposed to be retained and protected for the duration of the works. There are no disturbances within the structural root zone. The disturbance to the trees projected tree protection zone is under 10% by area. There are no long, or short-term impacts anticipated for this tree. **Tree Protection Tree 10.** The existing fence will protect the trees vascular tissue. The tree will require ground protection to protect the trees roots. To protect the trees root zone ground protection will be required. Ground protection will be required to allow for access whilst preventing compaction. 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. 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.

4.11 **Tree 11** is a maturing tree located to the north of the site close to the works. This tree is proposed to be retained and protected for the duration of the works. There are no disturbances within the structural root zone. The disturbance to the trees projected tree protection zone is under 10% by area. There are no long, or short-term impacts anticipated for this tree. **Tree Protection Tree 11.** The existing fence will protect the trees vascular tissue. The tree will require ground protection to protect the trees roots. To protect the trees root zone ground protection will be required. Ground protection will be required to allow for access whilst preventing compaction. 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. 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.

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 To allow the works to proceed it is recommended that no trees are removed. To allow the works to proceed it is recommended that trees 1 to 11 are retained and protected for the duration of the works. 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. The AQF level 5 site Arborist will need to sign off on the tree protection measures prior to works commencing. All alterations and additions will need to be approved in writing by the AQF level 5 site Arborist.

5.3 To manage the site it is recommended that monthly inspections and reporting is required to ensure the tree is adequately protected. All works within the structural root zone of any tree will need to be supervised by the AQF level 5 Site Arborist. All root pruning of roots 50mm+ on site will need to be completed by the AQF level 5 Site Arborist. 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.

5.4 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

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	*Corymbia gummifera* Red Bloodwood	15	.43 DAC .53	7	5.25 SRZ 2.6	Ba	Ba	2	M	M	A council street tree on the streetscape close to the works.
2	*Liquidambar styraciflua* Sweetgum	16	.51 DAC .65	9	6 SRZ 2.75	A	A	2	M	M	A council street tree on the streetscape close to the works.
3	*Liquidambar styraciflua* Sweetgum	16	.57 DAC .65	10	6.75 SRZ 2.75	A	A	2	M	M	A council street tree on the streetscape close to the works.
4	*Liquidambar styraciflua* Sweetgum	15	.44 DAC .55	8	5.3 SRZ 2.6	A	A	2	M	M	A council street tree on the streetscape close to the works.
5	*Liquidambar styraciflua* Sweetgum	14	.39 DAC .49	8	4.75 SRZ 2.5	A	A	2	M	M	A council street tree on the streetscape close to the works.
6	*Syzygium paniculatum* Lilly Pilly	7	.10 DAC .15	4	2 SRZ 1.5	A	A	2	L	L	This tree is located on the adjoining property to the south of the site.
7	*Syzygium paniculatum* Lilly Pilly	7	.08 x 3 DAC .15	3	2 SRZ 1.5	A	A	2	L	L	This tree is located on the adjoining property to the south of the site.
8	*Syzygium paniculatum* Lilly Pilly	7	.15 DAC .20	4	2 SRZ 1.7	A	A	2	L	L	This tree is located on the adjoining property to the south of the site.
9	*Corymbia citriodora* Lemon Scented Gum	17	.50 DAC .60	12	6 SRZ 2.7	A	Ba	2	M	M	This tree is partially suppressed by a larger tree to the south.
10	*Callistemon viminalis* Bottle Brush	6	.17 DAC .25	5	2.2 SRZ 1.85	A	A	2	M	M	
11	*Leptospermum laevigatum* Tea Tree	6	2 x .10, .15 DAC .15	5	2 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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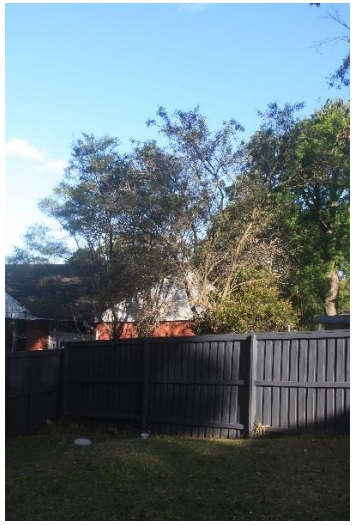
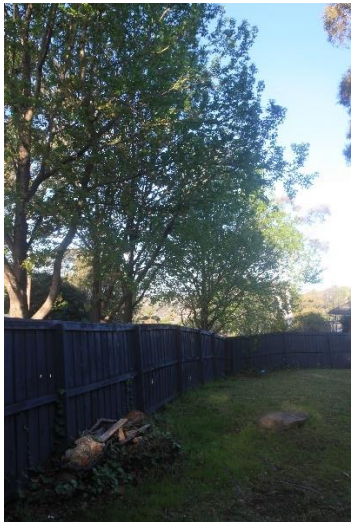
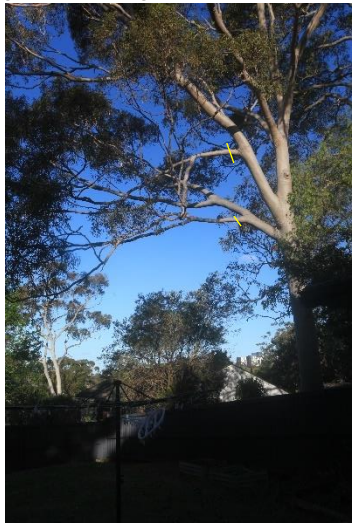
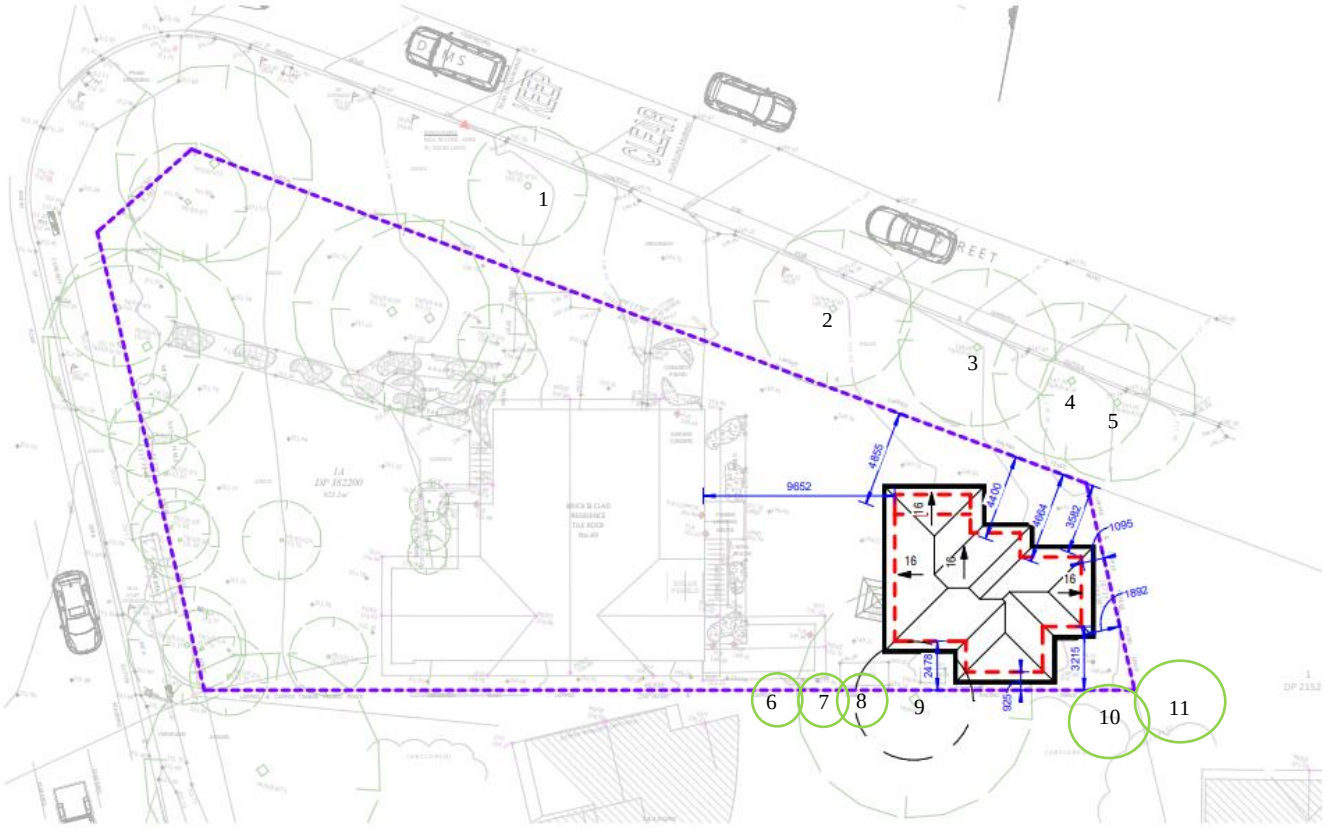
Appendix 3 Images of Tree




Image 1 above left shows tree 1 to the front of the site, close to the access point. Image 2 above left centre shows trees 2-5. Image 3 above right centre shows the roots of trees 2-5 at the surface in the grassed nature strip. Image 4 above right shows trees 6-9 to the rear of the site. Image 5 below left shows trees 10 & 11 to the rear of the site. Image 6 below left centre shows trees 2-5 and the area of their root zone that requires prtection. Image 7 below right shows tree 9 and the two 100mm diameter branches that need pruning, (yellow lines).

Appendix 4 Site Plan



1 SITE PLAN
1 : 200

SITE CALCULATIONS	
FLOOR AREA CALCULATIONS	
SITE AREA:	923.2m²
AREA OF THE EXISTING HOUSE FLOOR:	130m²
AREA OF THE PROPOSED GRANNY FLAT:	52m²
PROPOSED TOTAL FLOOR AREA:	182m²
SITE COVERAGE CALCULATION	
PROPOSED AREA:	285m²
LANDSCAPING CALCULATIONS	
PROPOSED TOTAL LANDSCAPED AREA:	638.2m²

	DCP SETBACK	PROPOSED
FRONT SETBACK	6.5M	EXISTING
SECONDARY RD	3.5M	3.5M
SIDE SETBACK1	0.9M	0.92M
SIDE SETBACK2	0.9M	1.095M

20 10 0 10 20 30 40 50 100mm

ARCHITECTURE INSIGHT

A02.04

Sheet Name: SITE PLAN
Address: 49 Forest Way, Frenchs Forest
Project Name: SECONDARY DWELLING

Lot no: 1A
DP: 382200
scale: 1:100 @A3

Client: AHMAD
Drawn by: AK

ISSUE	DATE	REVISION

Hayden Coulter
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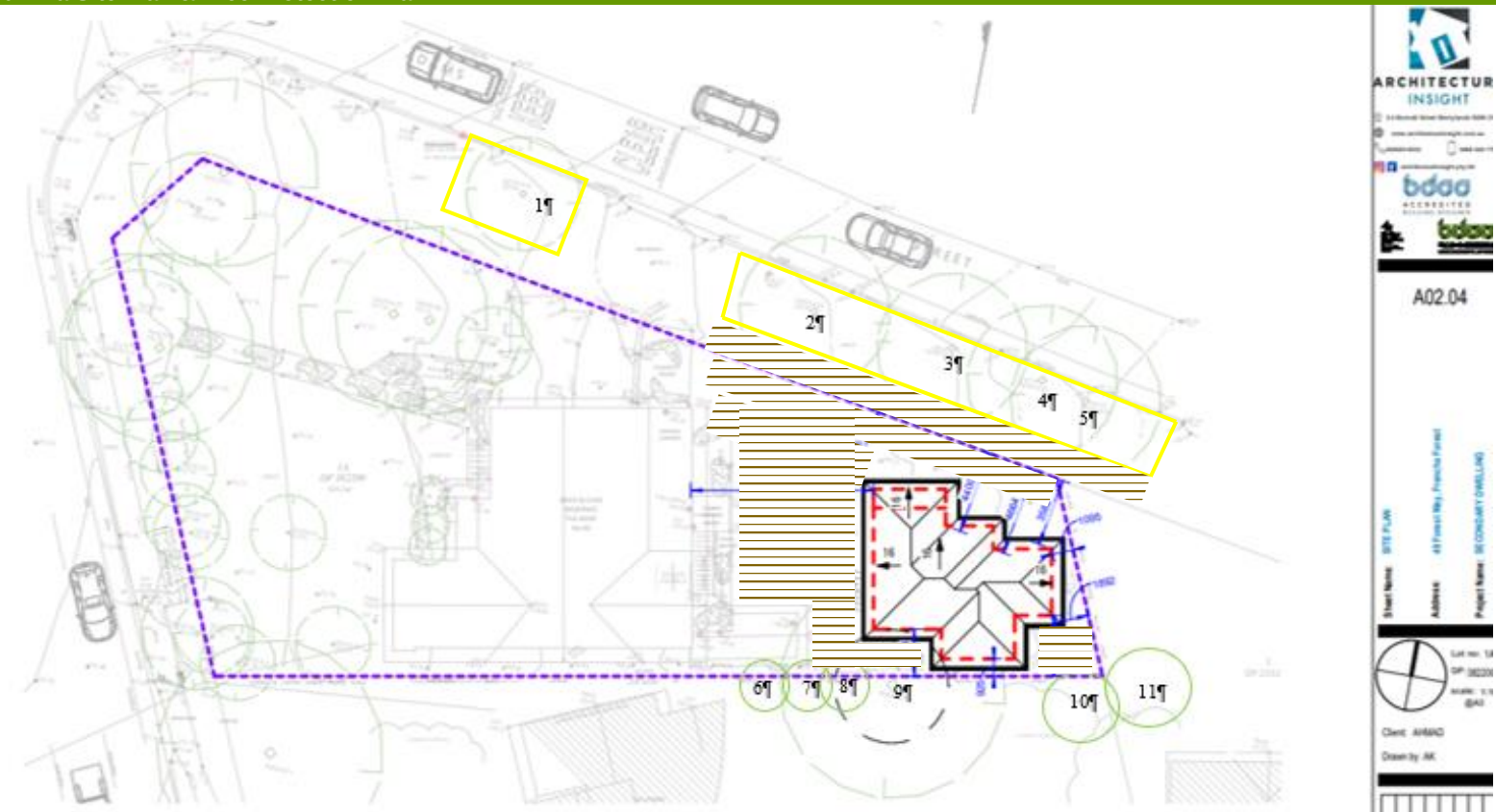
Appendix 4a Site Plan & Tree Protection Plan



1 SITE PLAN
1 : 200

SITE CALCULATIONS	
FLOOR AREA CALCULATIONS	
SITE AREA:	803.2m²
AREA OF THE EXISTING HOUSE FLOOR:	139m²
AREA OF THE PROPOSED GRANNY FLAT:	52m²
PROPOSED TOTAL FLOOR AREA:	192m²
SITE COVERAGE CALCULATION	
PROPOSED AREA:	285m²
LANDSCAPING CALCULATIONS	
PROPOSED TOTAL LANDSCAPED AREA:	638.2m²

	DCP SETBACK	PROPOSED
FRONT SETBACK	6.5M	EXISTING
SECONDARY RD	3.5M	3.5M
SIDE SETBACK1	0.9M	0.92M
SIDE SETBACK2	0.9M	1.095M

ARCHITECTUR INSIGHT
bdaa ACCREDITED
A02.04

1.8m Chain mesh fencing
1.8m trunk wraps.
Ground Protection.

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Appendix 4b Illustrations of Tree Protection

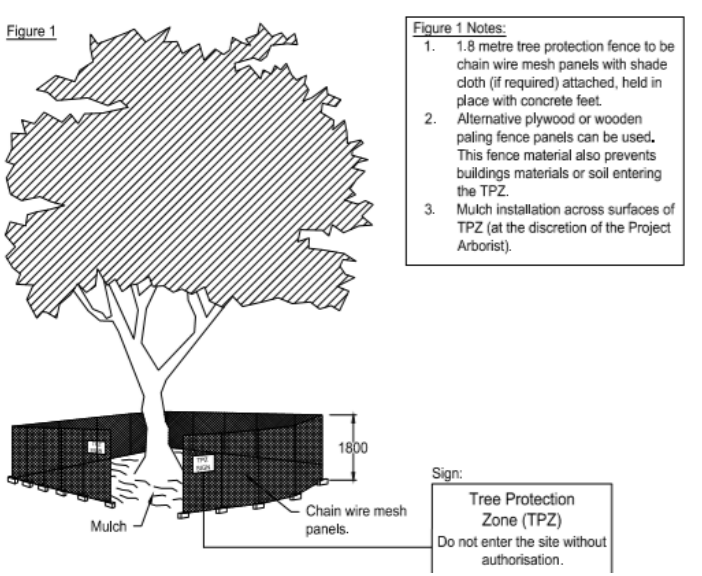

Figure 1 Notes:
1. 1.8 metre tree protection fence to be chain wire mesh panels with shade cloth (if required) attached, held in place with concrete feet.
2. Alternative plywood or wooden paling fence panels can be used. This fence material also prevents buildings materials or soil entering the TPZ.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

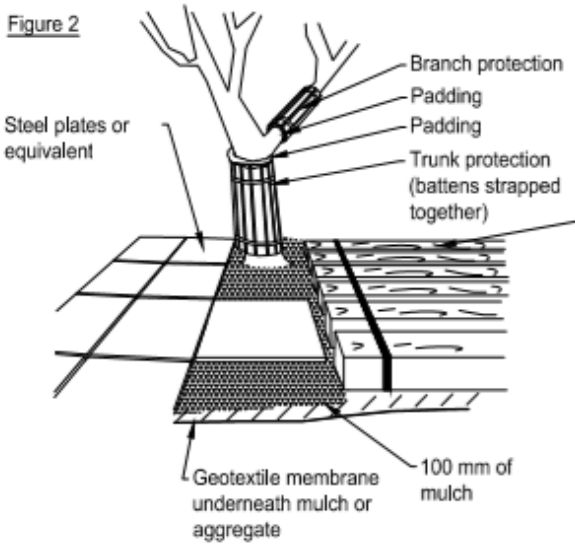

Figure 2 Notes:
1. For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
2. Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

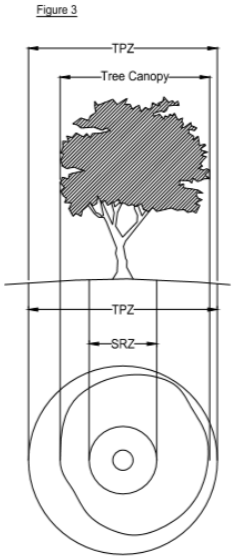

Figure 1 above left shows an example of a Tree Protection Zone using 1.8m chainmesh fence panels to isolate the tree from the works site, refer to The Australian Standard for the Protection of Trees on Development Sites AS4970.

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.

Estimated Life Expectancy	Significance				
	1. High	**2.** Medium	**3.** Low		
	Significance in Landscape	Significance in Landscape	Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
1. Long **>40 years**					
2. Medium **15-40 Years**					
3. Short **<1-15 Years**					
Dead					

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.