

ARBORICULTURAL IMPACT ASSESSMENT

Date: 9th November 2022

Site: 12 Coonanga Road, Avalon Beach 2107 (LOT 194 DP 14534)

Client: Gary Squire

Commissioned By: Rodney Bowry

Author: Antony Osborn

AQF5 Level Arborist

Sydney Arborist

1 Summary

- 1.1 The report was commissioned by Rodney Bowry to assess the impacts of the proposed building development on (5) five trees covered by Northern Beaches Council Tree Preservation Order at 12 Coonanga Road, Avalon Beach 2107.
- 1.2 The proposed development is a new home build. The stages of development will be demolition, site preparation and building of a new home.
- 1.3 Recommendations and suggestions are made in accordance with AS 4970-2009 Protection of Trees on Development Sites.
- 1.4 Recommendations have been made for the removal of Trees 1-4. The trees are located in the front of the property and are affected by the proposed development. It is likely the trees would not tolerate the impacts of the development (a combination of tree health, encroachment values, landscape significance and retention values were considered when making the determination).
- 1.5 The TPZ (Tree Protection Zone) and the SRZ (Structural Root Zone) have been included in the report to give a better understanding of the impacts and encroachments of the proposed building works (see Appendix 2 for calculations and see Glossary of Terms for definitions).
- 1.6 Suitable compensatory tree planting is required. Details including proposed species and the location of replacement planting are to be provided to council.
- 1.7 Tree 5 is located at the rear of the property and is unaffected by the building works. This tree will be retained. Tree protection should be put in place for this tree. A project arborist AQF5 or higher should be assigned to monitor the tree.
- 1.8 There are 3 other trees located in the footprint of the new pool. These are exempt species and will be removed prior to construction. No discussion or recommendation have been given on these trees.

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2 Introduction

2.1 The purpose of this report is to gauge the health and vigour of the trees affected by the proposed building works and to assess the impacts of the proposed development on the future health of the trees. The significance of the trees will be evaluated along with impacts of the proposed development. Options such as tree retention, tree protection and tree removal will be discussed.

2.2 This AIA (Arboricultural Impact Assessment) is a supporting document that will be presented to Northern Beaches Council as part of the DA. Northern Beaches Council are the determining authority that will make the final decision on the trees.

2.3 The property is located in the LGA (Local Government Area) of Northern Beaches Council.

2.4 The report was written by Antony Osborn, AQF5 level Arborist.

2.5 The following documentation was provided prior to writing this report:

Site survey plan.
DA plans – master set
Landscape plans

2.6 A site diagram has been provided with tree locations, SRZ and TPZ. The original DA plans were used for this purpose.

3 Method

- 3.1 On Saturday, 20th October 2022 a site inspection was carried out for the purpose of gathering information to produce this report. During the inspection all trees were assessed from ground level. The application of VTA (Visual Tree Assessment), *methodology produced by Mattheck & Breloer 1994*, was used in this process.
- 3.2 The trees health & vigour and future potential were assessed. The impact of building works and the trees capabilities to tolerate disturbances along with species and suitability was taken into consideration.
- 3.3 Trees are identified from ground level only by a visual assessment of foliage, other characteristics and the tree as a whole.
- 3.4 Photographs were taken using an iPhone.
- 3.5 Height measurements were estimated.
- 3.6 Canopy spread was measured to the four cardinal points (N, S, E, and W).
- 3.7 Diameter at breast height (DBH) was measured at 1.4 meters above ground level. The diameter at buttress (DAB) was measured just above the root buttress. The DBH for Tree 4 was made as a multi stem calculation.
- 3.8 The TPZ (Tree Protection Zone) and the SRZ (Structural Root Zone) have been included in the report to give a better understanding of the impacts and encroachments of the proposed building works (see Appendix 2 for calculations and see Glossary of Terms for definitions).
- 3.9 No invasive testing, root mapping, soil analysis, tomograph testing or resistograph drilling was undertaken.
- 3.10 Refer to the appropriate appendix for further information:
- Appendix 1 – Tree Schedule
 - Appendix 2 – Incursion Calculations
 - Appendix 3 – Tree protection (excerpt from AS 4970-2009 Protection of Trees on Development Sites)
 - Appendix 4 – Photographs
 - Appendix 5 - Hazard Rating Information
 - Glossary of Terms
 - PDF Attachment – Site Plan

4 Observations

- 4.1 The site is located at 12 Coonanga Road, Avalon Beach 2107 (LOT 194 DP 14534) and is located in the LGA (Local Government Area) of Northern Beaches Council.
- 4.2 The site faces south towards Coonanga Road and is a level block.
- 4.3 Map and tree locations (yellow circle):



- 4.4 See Appendix 1 for Tree schedule (data collected during site inspection).

The Trees

- 4.5 There were five (5) trees covered by councils Tree preservation order that were assessed during the site inspection. Tree 1-4 are located in the front yard and tree 5 is located at the rear of the property (see Appendix 4).
- 4.6 Trees 6-8 are located in the footprint of the new pool, they are exempt species. These will be removed prior to construction.
- 4.7 Tree1 is a mature *Angophora costata* (Angophora) and Tree 2 is an over mature *Corymbia citriodora* (Lemon scented gum). Both trees were exhibiting poor health and vigour at the

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time of inspection. Both trees had poor form and Tree 2 was in decline (see Appendix 4, figures 1 and 2).

4.8 Tree 3 and Tree 4 are mature *Melaleuca quinquenervia* (Paperbark). Both trees were exhibiting signs of fair health and vigour at the time of inspection. Tree 3 seems to have been lopped some time ago and as a result has poor form. Tree 4 has poor form and has some defects and included branch junctions (see Appendix 4, figures 3, 4, 5 and 6).

4.9 Tree 5 is a semi mature *Banksia integrifolia* (Coastal banksia). The tree is located at the rear of the property and was exhibiting signs of good health and vigour at the time of inspection (see Appendix 4, figure 7).

4.10 Tree 6 and Tree 7 are mature *Archontophoenix cunninghamiana* (Bangalow palms) and Tree 8 is an over mature *Grevillea robusta* (Silky oak). These trees are exempt species and will be removed prior to construction.

4.11 The subject species are not listed under the Threatened Species Conservation Act (1995).

4.12 The site is not located in a heritage conservation area. There are no heritage items on these trees.

5 Discussion

- 5.1 Tree 1 has a major encroachment from the proposed entrance pathway. There is also other activity to take place within the TPZ, these include a sandstone feature wall and bin storage. Tree 1 has poor form, is asymmetrical and is showing signs of poor health and vigour (see appendix 4, figure 1). It has low landscape significance and low retention value.
- 5.2 There is a proposed sandstone feature wall, planter box and bin storage located in the TPZ of Tree 2. It is hard to ascertain the exact value of the encroachment. This aside the tree has poor form, is showing signs of poor health and vigour and is in decline (see Appendix 4, figure 2). The tree has low landscape significance and low retention value.
- 5.3 Tree 3 has a major encroachment by the house and is further affected by a protrusion into the TPZ by the roof. There is also a small encroachment by the sandstone feature wall, planter box, bin area and other activity. The tree is showing signs of fair health and vigour, however seems to have been lopped some time ago and as a result has poor form. The stems have poor taper and heavy branch loading (see Appendix 4, figure 3 and 4). The tree has low landscape significance and low retention value.
- 5.4 Tree 4 has a major encroachment and is partly located in the footprint of the new development. The tree is over mature and is exhibiting signs of poor form (see Appendix 4, figure 5 and 6). The tree has low landscape significance and low retention value.
- 5.5 Tree 5 is not affected by any of the development and is to be retained (see Appendix 4, figure 7).
- 5.6 Tree 6, Tree 7 and Tree 8 are located in the footprint of the proposed swimming pool. They are exempt species under the council's Tree Protection Ordinance. The client has specified that these trees are to be removed prior to construction. No recommendations or further discussion will be made about these trees.

6 Conclusion and Recommendations

- 6.1 There is a major encroachment to the TPZ of Tree 1. The tree has low retention value and landscape significance. Due to the tree having poor form and showing signs of poor health and vigour it is not a viable option to retain tree during construction works. It is recommended the tree be removed.
- 6.2 Tree 2 is impacted by the proposed development. No further calculations are necessary as the tree is in decline and has a ULE of <5 years. No remedial measures would likely save the tree. It is recommended the tree be removed.
- 6.3 Tree 3 is impacted by the proposed development. Consideration was made for retaining the tree and altering building plans. However due to poor form of the tree, low landscape significance and low retention value. It is recommended the tree be removed.
- 6.4 Tree 4 is located in the footprint of the new development. The removal of the tree is required to accommodate the new development. The tree has poor form, low landscape significance and low retention value. It is recommended the tree be removed.
- 6.5 All tree removal work should be carried out by persons with AQF3 level training in Arboriculture and adhere to all industry standards.
- 6.6 Trees exhibiting signs of defects, poor form, low landscape significance and low retention value can be replaced with new tree plantings that better suit the location and with better form.
- 6.7 Suitable compensatory tree planting is required. Details including proposed species and the location of replacement planting are to be provided to council.
- 6.8 Tree protection fencing should be put in place to protect the TPZ of Tree 5 during the entire development process. This will restrict activities within the TPZ (see Appendix 3 for more information).
- 6.9 A project arborist, with AQF5 accreditation or higher, should be assigned to monitor the work throughout the construction process in order to ensure tree protection measures are adhered to. There should be a predetermined number of site inspections.

Antony Osborn



Sydney Arborist

(AQF5 Diploma of Arboriculture) In accordance with AS 4970-2009

7 Limitations on the use of this report

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

8 Assumptions

Care has been taken to obtain information from reliable sources. All data has been verified insofar as possible, however, Sydney Arborist or Antony Osborn can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

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

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

9 Bibliography

[Google Maps](#)

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Richard W. Harris, James R. Clark and Nelda P. Matheny.

The Body language of Trees, C. Mattheck

Field Guide for Visual Tree Assessment, C Mattheck

Northern Beaches Council Tree Preservation Order & Local Environment Plan 2012

Northern Beaches Council Development Control Plan

AS4970-2009 Protection of Trees on Development Sites SAI Global Sydney Australia

Appendix 1

Tree Schedule:

Tree No	Scientific Name (Common name)	Health	Vigour	Age	Height (m)	Canopy spread				DBH (cm)	DAB (cm)	TPZ Radius (m)	SRZ Radius (m)	Hazard Rating	ULE (Years)	Landscape Significance	Retention Value	Comments	Retain/ Remove
						N (m)	S (m)	E (m)	W (m)										
1	<i>Angophora costata</i> Angophora	P	P	M	10	0	7	7	3	29	38	3.5	2.2	5	5-15	Low	Low	Poor form, asymmetrical, poor health and vigour	Remove
2	<i>Corymbia citriodora</i> Lemon scented gum)	P	P	OM	13	7	0	11	0	33	45	4	2.4	6	<5	Low	Low	Poor form, asymmetrical, poor health and vigour, declining	Remove
3	<i>Melaleuca quinquenervia</i> Paperbark	F	F	M	13	4	3	2	2	49	61	5.9	2.7	7	5-15	Low	Low	Previous lopping, poor form	Remove
4	<i>Melaleuca quinquenervia</i> Paperbark	F	F	OM	10	7	7	2	4	77	99	9.3	3.3	5	5-15	Low	Low	Poor form, inclusions, possible past lopping	Remove
5	<i>Banksia integrifolia</i> Coastal banksia	G	G	SM	7	0	3	1	3	16	24	2	1.8	3	15-40	Medium	High	Good health and vigour, to be retained	Retain

*See Glossary of terms for definitions.

*Canopy: measured as (N) North, (S) South, (E) East, (W) West (4 Cardinal Points).

*See Appendix 5 for Hazard Rating calculations.

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Appendix 2

Incursion Calculations:

Tree No	SRZ (m)	SRZ Incursion	Area of TPZ (m ²)	TPZ Incursion (m ²)	TPZ Incursion %	TPZ Incursion Rating
1	2.2	Yes	38	6.1	16.1	Major
2	2.6	Yes	49.3	7.1	14.4	Major
3	2.7	Yes	108.6	13	12	Major
4	3.3	Yes	269.6	108	40.1	Major
5	1.8	No	12.6	0	0	N/A

* A minor incursion/encroachment is <10% of the area of the TPZ (Tree Protection Zone). This is classified as an acceptable encroachment by the Australian Standards and should not require detailed root investigation.

* A major incursion/encroachment is >10% of the area of the TPZ. This is classified as an unacceptable encroachment by the Australian Standards unless a qualified Arborist can prove that the tree is viable to withstand this encroachment. Root investigation is usually required.

Appendix 3

Tree Protection:

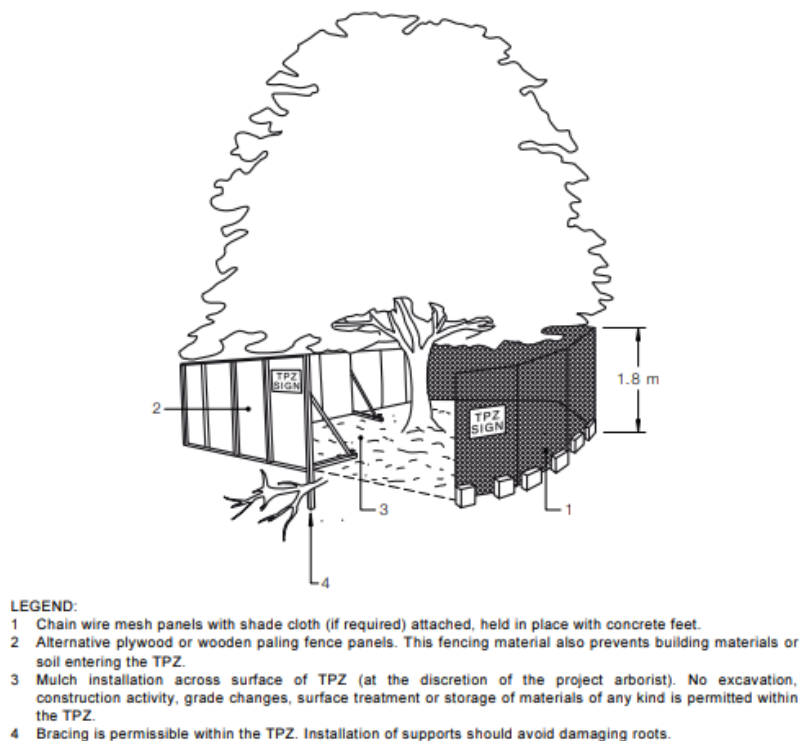


FIGURE 3 PROTECTIVE FENCING

Figure 1: This diagram is an excerpt from AS 4970-2009 Protection of Trees on Development Sites.

Fencing should be put in place around protected trees before any construction work commences. Protective fencing must not be tampered with during the entire development process, unless approved by the project arborist.

Activities generally excluded from TPZ's include b

- Mechanical excavation.
- Unsupervised manual trenching/ excavating.
- Cultivation.
- Storage.
- Mixing/ preparation of chemicals and cement.
- Parking of vehicles and plant.
- Refuelling.
- Waste/ rubbish disposal.

Washing/ cleaning equipment.
Dumping/ storing fill or soil.
Fires/ welding.
Changes in soil level.
Installation of utilities & signs.
Mechanical/ physical damage to tree.



Figure 2: This diagram is an excerpt from AS 4970-2009 Protection of Trees on Development Sites.

Signs should be attached to the protective fencing clearly identifying the Tree Protection Zone (TPZ)

A Project Arborist, with AQF5 accreditation or higher, should be assigned to monitor the work throughout all stages of the construction process in order to ensure tree protection measures are adhered to.

Appendix 4



Figure 1: Tree 1 *Angophora costata* showing poor form, poor health and vigour and asymmetrical crown.

Figure 2: Tree 2 *Corymbia citriodora* showing poor form, poor health and vigour, asymmetrical crown and exhibiting signs of decline. Low ULE <5 years.



Figure 3 and 4: Tree 3 *Melaleuca quinquenervia* showing signs of previous lopping and poor form.



Figure 5 and 6: Tree 4 *Melaleuca quinquenervia* exhibiting signs of poor form, asymmetrical crown and branch inclusions.



Figure 7: Tree 5 *Banksia integrifolia* to be retained. Tree protection fencing to be set up to protect the TPZ.

Appendix 5

Hazard Rating:

Consists of three categories:

- Potential failure
- Size of defective part
- Target

Each individual category has a 1-4 rating, totalling 12 (1 being a low risk and 12 being an extremely high risk)

Potential failure:

1. Low – Unlikely to fail
2. Medium – Defects are present (i.e. small cavity)
3. High – Significant defect (serious bark inclusion)
4. Severe – Possibly already failed (severe *Phellinus*/rot)

Size of defective part:

1. < 150mm in diameter
2. 150mm – 300mm in diameter
3. 300mm - 450mm in diameter
4. > 450mm in diameter

Target (Occupancy):

1. Occasional use
2. Intermittent use
3. Frequent use
4. Constant use

Potential failure + Size of defective part + Target = HAZARD RATING

Glossary of Terms

Age class - (SM) Semi Mature, (M) Mature, (OM) Over Mature.

Aerial Inspection - Refers to climbing a tree to obtain more accurate information.

AS4970 (2009) Protection of Trees on Development Sites – These are guidelines/ industry standards to minimise negative impacts on trees on building sites.

AS4373 (2007) Pruning of Amenity Trees – These are guidelines/ industry standards to minimise negative impacts on trees.

Classes - (G) Good, (F) Fair, (D) Declining, (P) Poor.

Critical Root Zone (CRZ) - Refers to a radial offset of five (5) times the trunk DBH measured from the centre of the trunk. This zone is often the I

Crown lifting – The removal of lower branches.

DBH (Diameter at Breast Height) – This is the diameter of the trunk at breast height (1.4 Metres above ground level).

Dead wood – Refers to any branches that have no living tissue left in them. Some dead wood can be beneficial for the tree.

Decay – Is when healthy wood/tissue breaks down.

Defect – An imperfection or flaw in the trees structure.

Die back – Refers to the dying of the tips or ends of branches. This can mean the tree is stressed and is a factor in assessing tree health.

Electrical service ☒

OHP Overhead electricity wiring.

LVOHP Low Voltage Overhead Power lines

HVOHP High Voltage Overhead Power lines

ABC Aerial Bundled Cable

Endemic – Restricted to a certain place.

Epicormic growth – Also known as sucker growth, is usually a result of bad pruning/lopping or signs of a stressed tree. They sprout from axillary buds in the bark. They are usually weakly attached.

Form – The visible shape or configuration of a tree.

Health – Refers to the trees ability to grow, modified by aspects of its environment. Signs of good health are; tree vigour, green foliage, crown density and amount of dead wood.

Classes are: Good (G), Fair (F), Declining (D) & Poor (P)

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Included bark/Inclusion – Refers to weak branch attachment. This is where bark grows between the join of the branch and stem instead of healthy tissue. Usually a very acute angled branch.

Indigenous – Native to Australia but not to one particular place.

Landscape significance rating – Refers to Species, Landscape Significance, Ecological Significance and Historical Significance.

Classes: Very high, High, Moderate, Low

Lopped – Incorrect pruning method not to AS4373 (2009) Pruning of Amenity Trees.

Point of attachment – Is the part of tree joins another i.e. a branch joins the trunk.

Retention value - The trees contribution to the amenity, landscape quality and visual character of an area that is important from a planning perspective.

Root mapping – Removing/excavating soil from around the roots with hand tools.

SRZ (Structural Root Zone) – Refers to the part of the root zone necessary for the structural integrity of a tree as set out in AS4970-2009 Protection of Trees on Development Sites. The calculation for this measurement is $((D \times 50)^{0.42} \times 0.64)$, D = Diameter at the trunk buttress measured in metres. The SRZ for trees with DAB under 0.15 metres is 1.5 metres.

Taper – Reduce or increase in thickness.

Transverse Crack ☐ A crack that extends crossways against the fibres of a tree part. Usually caused by bending of the trunk or branch.

Tree Protection Zone (TPZ) - Is the combination of root and canopy area required to maintain tree stability, health & vitality as set out in AS4970-2009 Protection of Trees on Development Sites. TPZ calculation is twelve (12) times the trunk DBH (Diameter at breast height) measured as a radial offset from the centre of the tree trunk. The TPZ indicates the location where protective fencing should be installed to create an exclusion zone around a protected tree.

Vigour – Refers to the growth rate of the tree. This includes; new growth, reaction wood, ability to compartmentalise at a rapid rate and the ability to fight off pest & disease infection.

Classes are: Good (G), Fair (F), Declining (D), and Poor (P)

Useful Life Expectancy (ULE) ☐ Is a guide to assessing trees longevity. ULE takes into consideration the trees environment, health, vigour, structural integrity and suitability. Adapted from Barrell 1996, (Updated April 2001).

Classes: (Long) 40 years +, (Medium) 15-40 years, (Short) 5-15 years, (Removal) Less than 5 years.

VTA (Visual Tree Assessment) – This refers to techniques developed to evaluate trees by Mattheck & Breloer "The Body Language of Trees".

Attachments

Site Plans: see separate PDF

