



ARBORICULTURAL IMPACT ASSESSMENT

21 Soldiers Avenue, Freshwater 8.02.2024

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1.Introduction

At the request of Accurate Design and Drafting, Lee Hancock Consulting Arborist was commissioned to prepare an Arboricultural Impact Assessment (AIA) of trees positioned on Lot 32 D.P. 9161 known as 21 Soldiers Avenue, Freshwater in the local government area of Northern Beaches Council.

1.1 The Proposal

The applicant seeks permission to demolish existing dwelling and construct a new dwelling.

2. Aim

The purpose of this report is to detail the condition of the trees on site. Trees to be removed and identifies impacts on trees onsite and offsite to be retained. The Arboricultural Impact Assessment (AIA) includes recommendations to minimise any adverse impacts, that the alterations and additions may have on the trees to be retained and trees off site. In preparing this report the author is aware of and will comply with the determining authorities Northern Beaches Council as Manly Development Control Plan (DCP) 2013 Manly Local Environment Plan (LEP).

Table 1. Documents Provided

PLAN/DOCUMENT	PREPARED BY	DWG/REF NO	DATED
Architect	Accurate Design and Drafting' for ICON Homes	23041, 2304-1, 2304-2, 23041 - 3	2023
Survey	Donovan and Assoc.	0308/330764	14.04.2023

3. Site Analysis

The site is a one and two storey rendered brick building on the corner of Soldier Avenue and Eric streets, the existing vegetation is minimal, one solitary Eucalyptus is positioned in the rear yard with an exempt Palm species.



4. Discussion

An assessment of the tree was made using the Visual Tree Assessment (VTA) procedure. The subject trees were assessed from the ground. No aerial inspection has been undertaken as part of this assessment. The initial point of reference in assessing the impacts of the proposed alterations and additions is AS4970 (2009) '*Protection of Trees on Development Sites*'.

4.1 This discussion will focus primarily on the trees that will experience conflicts with the proposed alterations and additions. This report will then guide the site layout and design process showing the spatial requirements and constraints the trees have imposed on the site.

Tree 1. *Lophostemon confertus* (Brush Box)

Heritage listed tree corner Shepherd and Eric Streets shall be provided with protection throughout all stages of the proposed development. Rated as high landscape significance and amenity value. High retention value. Retain and protect.

Tree 2. *Lophostemon confertus* (Brush Box)

Street Tree located Eric Street, shall be provided with protection throughout all stages of the proposed development. Rated as high landscape significance and amenity value. High retention value. Retain and protect.

Tree 3. *Lophostemon confertus* (Brush Box)

Street Tree located Eric Street, shall be provided with protection throughout all stages of the proposed development. Rated as high landscape significance and amenity value. High retention value. Retain and protect.

Tree 4. *Arecastrum romanzoffianum* (Cocos Palm)

Exempt species under Northern Beaches, removal is recommended.

Tree 5. *Eucalyptus saligna* (Sydney Blue Gum)

Mature tree in good form and vigour, positioned rear yard of proposed development, the supplied plan show tree will spatially conflict with the proposed new dwelling. Rated as high landscape significance amenity and ecological value. Removal is recommended.

Tree 6 – 12 *Heptapleurum arboricola* (Dwarf Umbrella Tree)

Informal screening hedge western boundary, the supplied plans show hedge will be adversely impacted upon by the proposed development. Rated as moderate landscape significance and amenity value. Low retention value

Tree 13. *Cupressus* spp.

Located offsite northern boundary, hedge planting in good form and vigour, the supplied plans show Hedge shall not be adversely affected by the proposed development.

Table 2. Tree Health and Retention Value

Tree	Genus & Species	Height	DBH/ DAGL	Crown Spread	Maturity	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	<i>Lophostemon confertus</i> (Brush Box)	12m	_____	_____	_____	_____	_____	Long greater than 40 years	High
2	<i>Lophostemon confertus</i> (Brush Box)	12m	_____	_____	_____	_____	_____	Long greater than 40 years	High
3	<i>Lophostemon confertus</i> (Brush Box)	12m	_____	_____	_____	_____	_____	Long greater than 40 years	High
4	<i>Arecastrum romanzoffianum</i> (Cocos Palm)	5m	_____	_____	_____	_____	_____	_____	Exempt Species Low
5	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	13m	570/ 670mm	25m2	Mature	Good	Moderate	Long greater than 40 years	Low
6.- 12	<i>Heptapleurum arboricola</i> (Dwarf Umbrella Tree)	6m	Multi stem						Low
13	<i>Cupressus</i> spp.	7m	No Access	20m2	Mature	Good	Moderate	Long greater than 40 years	Off site High

5. Conclusion

To conclude the site supports a total of 13 prescribed trees on site. The site analysis has collected all relevant data in assessing the condition of trees on site, an assessment of their health and vigour, estimated life expectancy and their significance in the landscape and amenity value have been recorded.

6. Recommendation

The supplied plans show Tree 5 will be adversely impacted upon by the proposed development, nominated for removal. Approved tree removal work shall be carried out by an experienced Certified AQF Level 3 Arborist in accordance with Safe Work Australia Code of Practice 'Guide to Managing Risks of Tree Trimming and Removal Work'.

6.1 Tree 4. Is an exempt species under Northern Beaches Council exempt species list. Tree removal work shall be carried out by an experienced Certified AQF Level 3 Arborist in accordance with Safe Work Australia Code of Practice 'Guide to Managing Risks of Tree Trimming and Removal Work'.

6.2 Trees 6 – 12 will be adversely impacted upon by the proposed development, nominated for removal.

6.3 Tree 13. Cupressus hedge offsite shall not be adversely impacted upon by the proposed development.

6.2 To compensate for the loss of amenity, replacement planting of trees as specified by the project Landscape Architects plan should be considered.

- The trees should have a minimum 10m height at maturity to compensate for the loss of existing trees.
- A proportion of the trees to be planted should also be locally occurring native canopy trees.
- The planting size shall be 75litres and compliant with the AS2373 *Tree Stock and Specifications for Landscape Uses*.
- Be located appropriately so that at maturity the canopies will be clear of the projected mature canopies of existing trees.
- Planted by a qualified horticulturalist or arborist AQF Certificate 3.
- The replacement plantings must be planted in such a manner as to promote good health during the establishment period, and must be maintained, as far as practicable to ensure tree growth into maturity.

Replacement species Council selected from Schedule 4 Part B Native Tree List

- *Tristaniopsis laurina* 'Luscious'
- *Glochidion ferdinandii* (Cheese Tree)
- *Ceratopetalum gummiferum* (New South Wales Christmas B

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7. Images

Plate 1. Tree 1. Heritage listed tree *Lophostemon confertus* (Brush Box) Shepherd Street



Plate 2.

Tree 2 & 3 *Lophostemon confertus* (Brush Box)



Plate 3. Tree 4. *Arecastrum romanzoffianum* (Cocos Palm)



Plate 4. **Tree 5. *Eucalyptus saligna* (Sydney Blue Gum)**



Plate 5. Trees 6 -12 *Heptapleurum arboricola* (Dwarf Umbrella Tree)



8. Tree Protection Specifications

The tree protection measures included in this document are site specific and are to be implemented prior to, during and after the construction phase, including embellishment works. The project arborist will monitor the impacts of demolition, bulk earth works, installation of temporary infrastructure including bunding, sediment control and drainage works.

The intention is to ensure that construction related issues and conflicts are resolved prior to the commencement of this project.

The aim is to ensure that specifications are site specific and that the previously approved masterplan Tree Management Plan can be implemented as part of the conditions of consent.

8.2 Certification Reporting

Following each stage, Site establishment, Construction Stage and Landscape Construction. The Project Arborist shall prepare a statement of compliance certifying whether the works have been completed in accordance with this plan and the conditions of development consent granted by the Northern Beaches Council.

8.3 Appointment of a Project Arborist

An Arborist with an AQF Level 5 Diploma in Arboriculture with experience in tree protection on construction sites should be engaged prior to the commencement of work on the site. Site monitoring will occur at each Hold Point. If conditions have been breached, remedial action shall be recommended to minimise any further adverse effect on the tree's health.

Table 3. Trees Impacted by Proposed development Assessment Schedule

Tree No.	Genus/Species	SRZ	TPZ	Incursions to root Zone &/or Canopy	Likely Impact	Recommendation
1	<i>Lophostemon confertus</i> (Brush Box)	_____	_____	Nil Impact	Nil impact if at all	Heritage tree. Trunk protection installed prior to site establishment.
2	<i>Lophostemon confertus</i> (Brush Box)	_____	_____	Nil Impact	Nil impact if at all	Trunk protection installed prior to site establishment.
3	<i>Lophostemon confertus</i> (Brush Box)	_____	_____	Nil Impact	Nil impact if at all	Trunk protection installed prior to site establishment.
4	<i>Arecastrum romanzoffianum</i> (Cocos Palm)	_____	_____	_____	_____	Biosecurity Weed Removal is recommended.
5	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	2.6mR	5.7 mR	Adverse impact from proposed development	Adverse impact from proposed development	Removal is recommended.
6-12	<i>Heptapleurum arboricola</i> (Dwarf Umbrella Tree)	_____	_____	Adverse impact from proposed development	Adverse impact from proposed development	Removal is recommended
13	<i>Cupressus</i> spp.	NO access	NO Access	Nil Impact if at all	Nil impact if at all	Retain

8.4 Tree Removal

Approved tree removal shall be obtained prior to the removal of Trees 4, 5, 6 – 12 before site establishment. Tree removal work shall be carried out by an experienced Certified AQF Level 3 Arborist in accordance with Safe Work Australia Code of Practice 'Guide to Managing Risks of Tree Trimming and Removal Work'.

8.5 Mulch

To be applied in TPZ minimum 75 -100mm using material that complies with Australian Standard® 4454-2003 *Composts, soil conditioners and mulches*.

8.5.1 Signage - Tree Protection Zone

To be displayed around the edge of all TPZ fenced off areas and visible within the development site.

Identifying the TPZ should be placed outside the edge of TPZ .

Figure 1. Indicative Street Tree Protection



8.5.2 Trunk Protection

Trunk Protection by way of Timber planks (50mm x 100mm or similar) shall be placed around tree trunks. The timber planks shall be spaced at 100mm intervals, and must be fixed against the trunk secured together with 2mm galvanised wire. These shall be strapped around the trunk (not fixed in anyway) to avoid mechanical injury or damage. Trunk protection should be installed prior to any site works and maintained in good condition for the duration of the construction period. The hessian and timber planks must not be fixed to the tree in any instance or in any fashion.

8.6 Temporary Infrastructure

Site sheds, Waste disposal and Stock piling areas to be placed outside the Tree Protection Zone.

8.7 Haul Route vehicles accessing site.

Haul route usage entry from Soldiers Avenue.

8.8 Landscape Construction

The landscape plan to be checked for compliance with the tree protection plan. Project Arborist to approve the staged removal of protection measures required to allow for landscape works. This includes the installation of paving, irrigation, installing and planting.

8.9 Post Construction Phase

On completion of construction and landscaping works. Project Arborist to assess tree condition and provide certification of tree protection. Following final inspection Project Arborist should certify that the completed works have been carried out in compliance with the approved plans and specifications for tree.

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9. Methodologies

9.1 Visual Tree Assessment (VTA)

A visual tree assessment technique developed by (Mattheck & Breloer) was carried out on the subject tree from the ground. The technique involves identification of the Genus and Species of trees on the site. The Diameter at Breast Height (DBH) 1.4m above ground level determined from the circumference of the trunk divided by π (π).

Tree height (m) Diameter at Ground Level (DAGL), Canopy spread (m) in four cardinal points (north, south, east, west) Structural integrity, Amenity value, Indigenous/ Endemic value, Health, and vigor of trees.

9.2 Useful Life Expectancy (ULE)

An assessment procedure has been developed by (Barrell, J.D.) 1993 'by which trees on a site are accurately recorded and designated according to their suitability for retention in the short, medium or long term'. This methodology is a measure of the "sustainability" of the remaining contribution in years that the tree can provide in the context of the site.

9.3 Landscape Significance

The significance of trees in the landscape is assessed in determining their retention values in 3 categories. Heritage Value reflects Historical significance, Ecological Value maintains biodiversity values and Amenity values contributes to the character of the landscape.

9.4 Tree Retention Values

A rating was given to each tree on site; the information gathered was then processed by evaluating the health and vigour, the remaining useful life expectancy (ULE), plus their significance in the landscape. A retention value for each tree was then evaluated ranging from High, Moderate, Low and Very Low.

9.5 Structural Root Zone (SRZ)

SRZ is the measurement of the area around the base of the tree. Measurements are taken at the centre of the trunk; a radial measurement is calculated in meters. This process determines the trees' structural stability. The formula is $SRZ \text{ radius} = (D \times 50) \times 0.64$ D = trunk diameter, in meters.

9.5.1 Determining Structural Root Zones

As defined in AS 4970 Section 1.4.5 the SRZ is 'the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright.' The SRZ area has been calculated as specified in Section 3.3.5 of AS 4970.

9.6 Tree Protection Zone (TPZ)

This area is specified above and below the ground at a given distance from the trunk to protect tree roots and canopy to protect the viability and stability of a tree retained on site where there is a potential for the tree to be damaged by development.

9.6.1 Determining Tree Protection Zone

As defined in AS 4970 Section 1.4.7 the TPZ is 'a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown (canopy) to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

As defined in AS 4970 Section 1.4.7 the TPZ is 'a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown (canopy) to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development.

Retention Values.

	Landscape Significance Rating						
Estimated Life Expectancy	1	2	3	4	5	6	7
Long - Greater than 40 Years	High Retention Value			Moderate Retention Value			
Medium- 15 to 40 Years							
Short - 5 to 15 years				Low Ret. Value			
Transient - Less than 5 Years				Very Low Retention Value			
Dead or Potentially Hazardous							

Retention Value Methodology

RETENTION VALUE	RECOMMENDED ACTION
“High”	<ol style="list-style-type: none"> 1. These trees considered worthy of preservation as such careful consideration should be given to their retention as a priority. 2. Proposed site design and placement of buildings and infrastructure should consider lessening any mitigating issues in relation to trees. 3. In addition, the extent of the canopy (canopy dripline) should also be considered, particularly in relation to high rise developments. Significant pruning of the trees to accommodate the building envelope or temporary scaffolding is generally not acceptable.
“Moderate”	<ol style="list-style-type: none"> 1. These trees should be retained as part of any potential development if possible however they trees are considered less critical for retention. 2. If these trees must be removed, replacement planting should be considered in accordance with Council’s Tree Replacement Policy to compensate for loss of amenity.
“Low”	<ol style="list-style-type: none"> 3. These trees are not considered to worthy of any special measures to ensure their preservation, due to current health, condition, or suitability. They do not have any special ecological, heritage or amenity value, or these values are substantially diminished due to their ULE. 4. These trees should not be considered as a constraint to the potential development of the site.
“Very Low”	<ol style="list-style-type: none"> 1. These trees are considered potentially hazardous or very poor specimens or may be environmental or noxious weeds. 2. The removal of these trees is therefore recommended regardless of the implications of any proposed development.

10. References

AS4970 '*Protection of Trees on development Sites*'. (2009)

Biosecurity Act 2015.

Harris, Clark & Matheny. *Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines*, (1999) Prentice Hall, New Jersey.

Mattheck, C. & Breloer, H. (1994) *The Body Language of Trees*.

Morton, A. Earthscape Horticultural Services -Tree Retention Values

www.northernbeaches.nsw.gov.au/environment/trees

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