

ARBORICULTURAL IMPACT ASSESSMENT

Prepare for Yvonne & Mark West
5 Cullen Street, Forestville 13.8.2021

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1.Introduction

At the request of Yvonne and Mark West, Lee Hancock Consulting Arborist AQF Level 5 was commissioned to prepare an Arboricultural Impact Assessment of trees located on and offsite of the 9 Cullen Street, Forestville, 4 Section 44 DP 758421 in the local government area (LGA) Northern Beaches Council.

1.1 The Proposal

The applicants seek approval to demolish existing structure and construct a new residence with inground pool.

2. Aim

This report has been undertaken to meet the following objectives:

- Conduct a visual assessment of all trees where works will be undertaken for the proposed construction and pool installation
- Recommend removal or retention of trees.
- Provide Tree protection specifications for the long-term viability of trees retained.

2.1 Measures necessary to protect the trees throughout all demolition and construction phases have been recommended and methodologies to minimise impacts on the retained trees, where there is encroachment into the TPZ (Tree Protection Zone) have also been included.

2.2 The author is aware of and will comply with the determining authorities Northern Beaches Council Warringah LEP2011 - Land zoned R2 Low Density Residential.

Table 1. Documents Provided

PLAN/DOCUMENT	PREPARED BY	DWG/REF NO	DATED
Architectural Drawings	Dragonfly Architects	DFA2011 –A03 A04,A05,A06,A07,A08, A09, A10, A11 A12	August 2021
Surveyor	TSS Total Surveying Solutions	201542-1	28.4.2021

2.3 All trees included in the site survey are numbered and assessed by the Author as the basis as to which trees are suitable for retention.

For each tree they have been assessed for.

- a) Correct botanical identification and common name
- b) Health and vigour
- c) Structure
- d) Dimensions, height, crown spread and DBH
- e) Age class
- f) Estimated life expectancy
- g) Heritage and /or cultural matters
- h) Ecological and habitat matters
- i) The location relative to existing site features
- j) Other matters to the site
- k) Retention value

2.4 Wildlife Habitat

The majority of the trees are local native species.

2.4.1 Noxious Plants and Environmental Weeds

None of the trees assessed are scheduled as weeds by the Biosecurity Act 2015.

2.4.2 Threatened species& Ecological Communities

None of the subject trees are listed as NSW Threatened Species Scientific Committee or form part of Endangered Ecological Communities (EEC's) under the provisions of the Biodiversity *Conservation Act 2016*.

2.4.3 Heritage Conservation Area

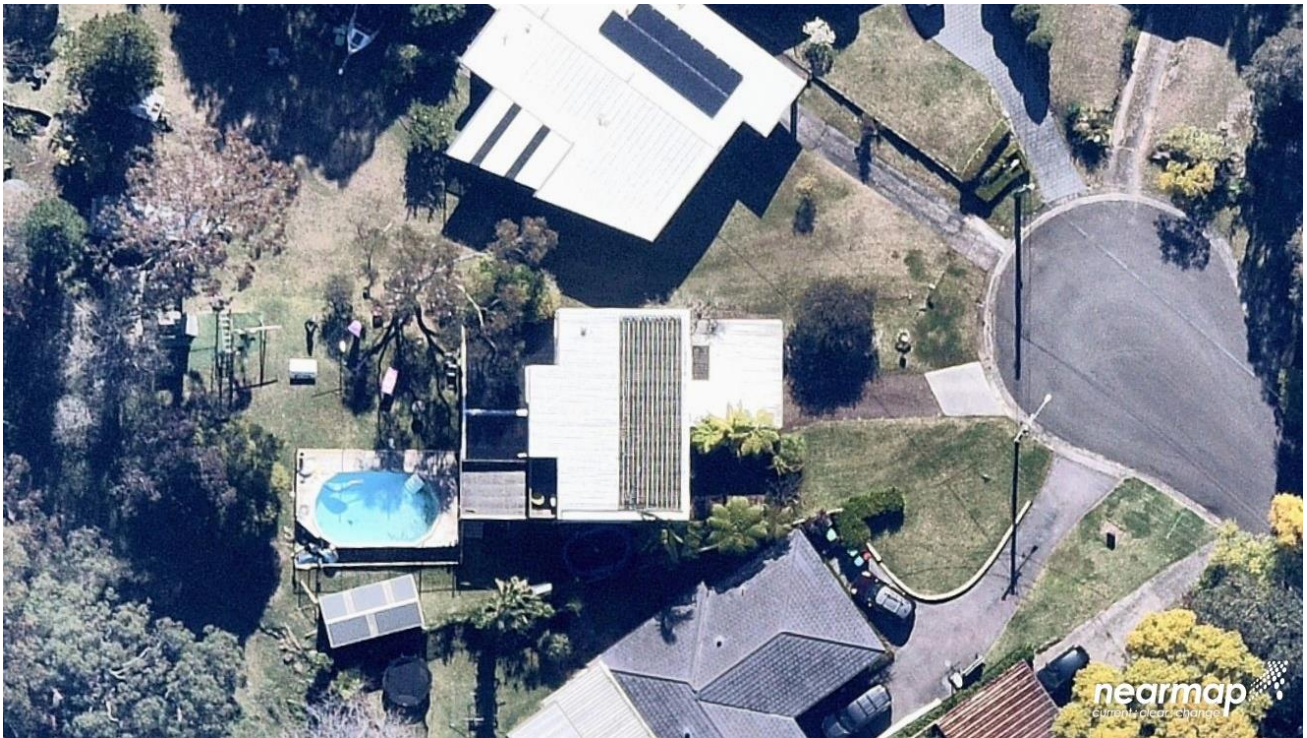
The site is not in a Heritage Conservation Area

2.5.4 Significant Tree Register

Council does not currently maintain a Register of Significant Trees in progress.

3. Site Analysis

The existing residence is single storey brick clad residence, located in a cul de sac, the existing vegetation the site supports consists of Palm trees at the entrance to residence and car port, the rear of the site supports a mix of native and exotic shrubs and trees.



4. Discussion

An assessment of each 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 development is AS4970 (2009) *'Protection of trees on development sites*.

4.1 Each tree has been provided with an identification number for reference purposes denoted on the Tree Location Plan. This discussion will focus primarily on the trees that will experience conflicts with the proposed development. This report will then guide the site layout and design process showing the spatial requirements and constraints the trees have imposed on the site.

4.2 Measures necessary to protect the trees throughout all demolition and construction phases have been recommended and methodologies to minimise impacts on retained trees.

Tree 1. *Cyathea cooperi* (Coin Spot Tree Fern) x 3

Tree ferns positioned southern side of existing garage, in good form and vigour, the supplied plans show tree ferns will be adversely impacted upon by the proposed development. Rated as moderate landscape significance amenity value. Low retention value.

Tree 2. *Howea forsteriana* (Kentia Palm)

Positioned between the two Coin Spot Tree Fern, in good form and vigour, palm is listed as an exempt species. Recommended for removal.

Tree 3. *Howea forsteriana* (Kentia Palm)

Positioned adjacent to entrance trees 1 and 2, 3 palms identified as Kentia Palm are listed as exempt species. Removal is recommended.

Tree 4. *Melaleuca citrinus* (Bottlebrush)

Mature small tree in fair form and vigour, located northern boundary. The supplied plans show tree will be adversely impacted upon by the proposed development. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 5. *Acer palmatum* (Japanese Maple)

Mature small tree positioned in close proximity to existing building, in poor form and vigour, tree is not considered worthy of any special measures for its retention. Rated as moderate landscape significance amenity. Low retention value.

Tree 6. *Michaelia figo* (Port Wine Magnolia) offsite

Large shrub form in good form and vigour, the supplied plans show shrub will be adversely impacted upon by the proposed development. Rated as moderate landscape significance and amenity value. Low retention value.

Tree 7. *Eucalyptus haemostoma* (Scribbly Gum)

Mature tree in fair form and vigour, located offsite adjacent property. The supplied plans show tree will be impacted inside the Structural Root Zone (SRZ) 14% and into the Tree Protection Zone of 18% this is an unacceptable incursion as stated in AS 4970 Protection of Trees on Development Sites (2009). The proposed level changes will add extra emphasis that the tree will require removal. Rated as moderate landscape significance amenity and ecological value. Low retention value.

Tree 8. *Morus* spp.

Positioned offsite as part of a cubby house, the existing cubby house shall buffer the root zone of the tree and will remain viable into the future tree is in good form and vigour, rated as moderate landscape significance and amenity value. High retention value.

Tree 9. *Eucalyptus saligna* (Sydney Blue Gum)

Mature tree located offsite in good form and vigour, appears structurally stable, the supplied plans show trees Tree protection Zone will experience an acceptable incursion of 7%, when tree sensitive methodologies are implemented, the tree will remain viable into the future. Rated as high landscape significance amenity and ecological value. High retention value.

Tree 10. *Angophora costata* (Sydney Red Gum)

Semi mature tree western boundary, in good form and vigour, the supplied plans show tree will incur a 2% incursion into Structural Root Zone (SRZ) and an incursion Tree Protection Zone (TPZ) of 11% apart from a very minor incursion into the Structural Root Zone SRZ and an acceptable incursion into the TPZ, tree will not be adversely impacted upon when tree sensitive protection methods are implemented. Rated as high landscape significance amenity and ecological value. High retention value.

Tree 11. *Jacaranda mimosifolia* (Jacaranda)

Mature tree located adjacent to existing pool, in good form and vigour, tree will experience an incursion into Structural Root Zone (SRZ) of 18% unacceptable as stated in AS 4970 and an incursion of 20% into Tree Protection Zone (TPZ) unacceptable as stated in AS4970. The tree is registered in Councils Exempt Species List and is nominated for removal.

Tree 12 *Liquidamber styraciflua* (Liquidambar)

Tree is remote from proposed works, to ensure the tree is not impacted upon by the proposed development site fencing shall be installed prior to site establishment. Rated as high landscape significance and amenity value. High retention value.

While there are other trees offsite adjacent to Tree 12. They are outside of any proposed works and will not be impacted upon by the proposed development.

Table 2. Tree Health and Retention Values.

Tree	Genus & Species	Height	DBH /DAGL	Crown Spread	Maturity	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value
1	<i>Cyathea cooperi</i> (Coin Spot Tree Fern) x 3	Variable 2 – 4m	_____	10m2	Mature	Good	Moderate	Long greater than 40 years	Low
2	<i>Howea forsteriana</i> (Kentia Palm)	4m	_____	10m2	Mature	Good	Moderate	Long greater than 40 years	Low
3	<i>Howea forsteriana</i> (Kentia Palm) X 3	Variable 4m	_____	10m2	Mature	Good	Moderate	Long greater than 40 years	Low
4	<i>Melaleuca citrinus</i> (Bottlebrush)	4m	Multi stem	15m2	Mature	Good	Moderate	Medium 15-25 Years	Low
5	<i>Acer palmatum</i> (Japanese Maple)	3.5m	Multi stem	10m2	Mature	Poor	Moderate	Medium 15-25 Years	Low
6	<i>Michaelia figo</i> (Port Wine Magnolia)	4m	Multi stem	10m2	Mature	Poor	Moderate	Medium 15-25 Years	Low
7	<i>Eucalyptus haemostoma</i> (Scribbly Gum)	11m	Multi stem	20m2	Mature	Good	Moderate	Medium 15-25 Years	Offsite Low
8	<i>Morus</i> spp. (Mulberry)	7m	Multi stem	20m2	Mature	Good	Moderate	Medium 15-25 Years	High
9	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	18m	580/680mm	30m2	Mature	Good	Moderate	Medium 15-25 Years	High

Tree	Genus & Species	Height	DBH /DAGL	Crown Spread	Maturity	Health and Vigour	Landscape Significance Rating	Useful Life Expectancy	Retention Value
10	<i>Angophora costata</i> (Sydney Red Gum)	12m	290 /350mm	20m2	Semi mature	Good	High	Long greater than 40 years	High
11	<i>Jacaranda mimosifolia</i> (Jacaranda)	11m	350/ 450mm	20m2	Semi mature	Good	Moderate	Long greater than 40 years	Low
12	<i>Liquidamber styraciflua</i> (Liquidambar)	20m	750/ 850mm	30m2	Mature	Good	High	Long greater than 40 years	High
13	<i>Livistona australis</i> (Cabbage Tree Palm)	22m	No access	No access	Mature	Good	High	Long greater than 40 years	High

AS 4970 *The TPZ of palms cycads and tree ferns should not be less than 1m outside the crown projection.*

5. Conclusion

The site analysis has collected all relevant data in assessing the condition of 12 trees on and offsite, an assessment of their health and vigour, estimated life expectancy and their significance in the landscape and amenity value h

6. Recommendation

The proposed development will necessitate the removal of trees numbered 1,2,3,4,5,6, 7 and 11. Trees are either exempt species or will be adversely impacted upon by the proposed development.

Approved tree removal 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 Trees numbered 8, 9, 10, 12 and 13 are nominated for retention and protection throughout all stages of the development.

Refer Section 10. Tree protection Specifications.

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 tree 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 75 litres 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.

7. Images Tree 1. *Howea forsteriana* (Kentia Palm) & Trees 2. *Cyathea cooperi* (Coin Spot Tree Fern)



Tree 3. *Howea forsteriana* (Kentia Palm)



Trees 4 *Melaleuca citrinus* (Bottlebrush) & Tree 5. *Acer palmatum* (Japanese Maple)



No Image Tree 6. *Michaelia figo* (Port Wine Magnolia)

Tree 7. *Eucalyptus haemostoma* (Scribbly Gum)



Tree 8. *Morus* Spp. (Mulberry)

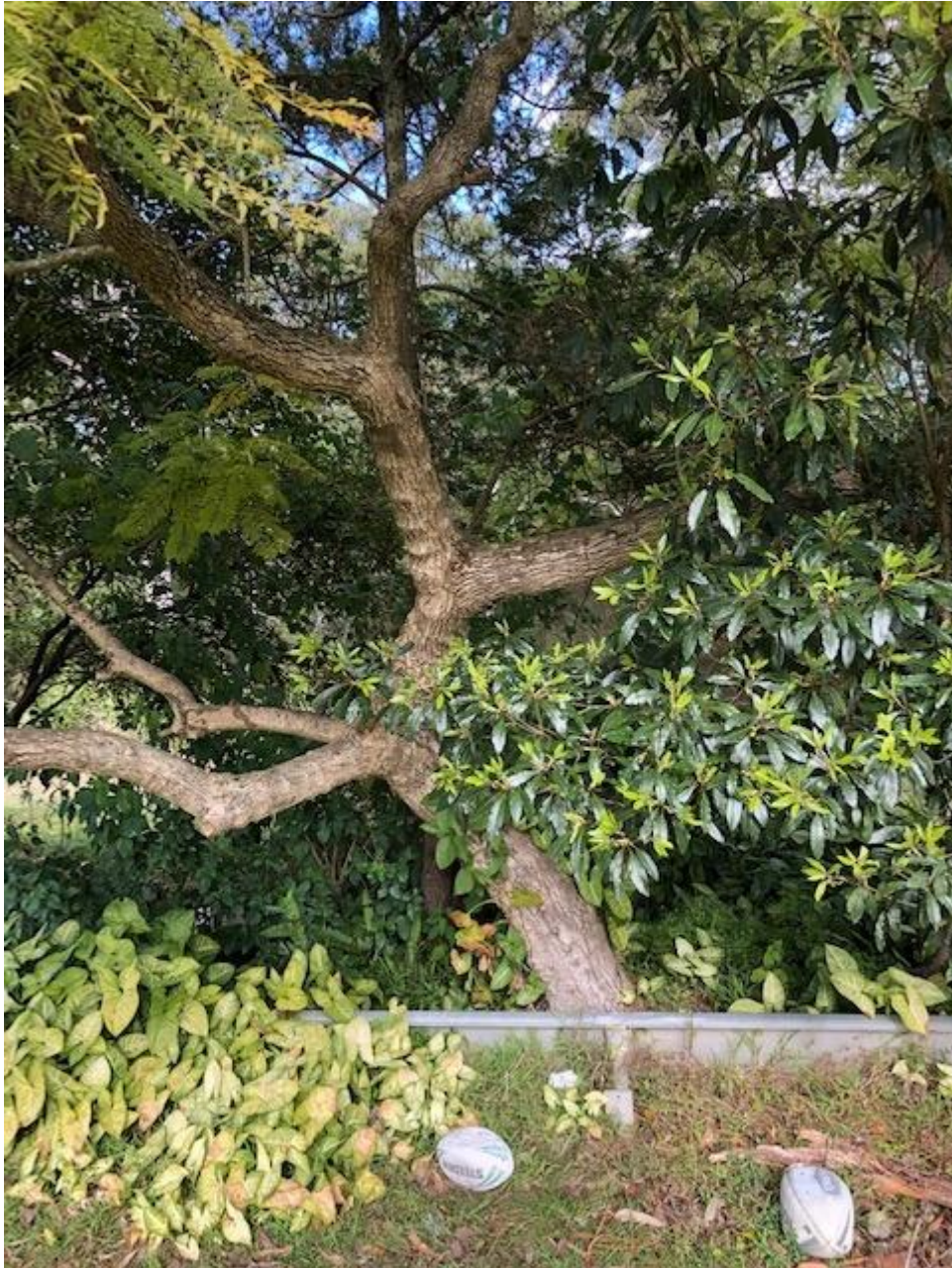


No Image Tree 9. *Eucalyptus saligna* (Sydney Blue Gum)

Tree 10. *Angophora costata* (Sydney Red Gum)



Tree 11. *Jacaranda mimosifolia* (Jacaranda)



Tree 12. *Liquidambar styraciflua* (Liquidambar)



No Image Tree 13 *Livistona australis* (Cabbage Tree Palm)

8. References

AS4373 '*Pruning of Amenity Trees*' (2007)

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

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

Disclaimer

The author, Lee Hancock Consulting Arborist takes no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modifications to its growing environment either above or below ground contrary to our advice.

This report is a recommendation only. In no way does it guarantee any particular actions by the determining authorities.

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.

10.5.1 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 Zones

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’. The TPZ is the root zone/canopy area required for vigour and long-term viability. The TPZ area has been calculated as specified in Section 3.2 of AS 4970.

9.7 Variations to the TPZ – Minor

If there are no other options a minor encroachment ($\leq 10\%$) into the TPZ area may be acceptable provided the incursion does not impact the SRZ. Examples of how minor encroachments can be configured are given in Appendix X. Refer to Section 3.3.2 of AS 4970 for additional details relating to minor encroachments. AS 4970 states that the area lost to the encroachment must be compensated for elsewhere and must be contiguous with the TPZ.

9.8 Variation to the TPZ – Major

Should major encroachments ($> 10\%$) of the TPZ be proposed it must be demonstrated by The Project Arborist that the tree will remain viable into the long term. Demonstration of viability may include non-destructive methods of root investigation and should be made in consideration of the following factors as listed in Section 3.3.4 of AS 4970

Retention Values.

	Landscape Significance Rating						
Estimated Life Expectancy	1	2	3	4	5	6	7
Long - Greater than 40 Years	High Retention Value						
Medium- 15 to 40 Years			Moderate Retention Value				
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”	These trees considered worthy of preservation and as such careful consideration should be given to their retention as a priority. Proposed site design and placement of buildings and infrastructure should consider lessening any mitigating issues in relation to trees. 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”	These trees should be retained as part of any potential development if possible however they trees are considered less critical for retention. 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”	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. These trees should not be considered as a constraint to the potential development of the site.
“Very Low”	These trees are considered potentially hazardous or very poor specimens or may be environmental or noxious weeds. The removal of these trees is therefore recommended regardless of the implications of any proposed development.

10. Tree Protection Specifications

The tree protection measures included in this plan, are to be implemented prior to, during and after the construction phase, including landscape construction of the project to ensure the long - term survival of the trees. 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 (with tree retention) are resolved prior to the commencement of this project. The aim is to ensure that specifications site specific and that the whole Tree Management Plan can be required to be implemented as part of the conditions of consent.

10.1 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 compliance with this plan and the conditions of development consent Northern Beaches Council relating to Tree Protection. If conditions have been breached, remedial action shall be recommended to minimise any further adverse effect on the tree's health.

10.2 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. If conditions have been breached, remedial action shall be recommended to minimise any further adverse effect on the tree's health.

Hold Point: PRE-CONSTRUCTION - Prior to Site Clearance

Project Arborist to inspect Tree Protection Measures are compliant with *AS4970 Protection of Trees on Development Sites*.

Compliance certificate will then be issued to the Principal Certifier by the Project Arborist.

Table 3. Impact Assessment Schedule

Tree	Genus /species	SRZ	TPZ	Incursion to root zone / canopy	Recommendations
1	<i>Cyathea cooperi</i> (Coin Spot Tree Fern) x 3	1mr	1mr	Adverse impact from proposed development.	Removal is recommended
2	<i>Howea forsteriana</i> (Kentia Palm)	1mr	1mr	Exempt species	Removal is recommended
3	<i>Howea forsteriana</i> (Kentia Palm) x 3	1mr	1mr	Exempt species	Removal is recommended
4	<i>Melaleuca citrinus</i> (Bottlebrush)	Multi stem	Multi stem	Adverse impact from proposed development.	Removal is recommended
5	<i>Acer palmatum</i> (Japanese Maple)	Multi stem	Multi stem	Adverse impact from proposed development.	Removal is recommended
6	<i>Michaelia figo</i> (Port Wine Magnolia)	Multi stem	Multi stem	Adverse impact from proposed development.	Removal is recommended
7	<i>Eucalyptus haemostoma</i> (Scribbly Gum)	3.0mR	7.0mR	Unacceptable incursion into SRZ 14% Unacceptable incursion into TPZ 18%	Off site Removal is recommended
8	<i>Morus</i> spp. (Mulberry)	Multi stem	Multi stem	Retain and protect	Tree Protection fence and ground protection installed.
9	<i>Eucalyptus saligna</i> (Sydney Blue Gum)	2.8mR	Acceptable incursion 7% 6.9mR	Retain and protect	Tree Protection fence and ground protection installed.
10	<i>Angophora costata</i> (Sydney Red Gum)	2.1mR 2% minor incursion into SRZ	Acceptable 11% incursion into TPZ	Retain and protect	Tree Protection fence and ground protection installed.
11	<i>Jacaranda mimosifolia</i> (Jacaranda)	2.4mR unacceptable incursion into SRZ 18%	4.2 mR unacceptable incursion 20% into TPZ	Adverse impact from proposed development	Removal is recommended.
12	<i>Liquidamber styraciflua</i> (Liquidambar)	2.8mR	6.9mR	Nil Impact	Retain and protect.
13	<i>Livistona australis</i> (Cabbage Tree Palm)	1mR	1mR	Minor impact if at all	Retain and protect Tree Protection fence installed.

AS 4970 The TPZ of palms cycads and tree ferns should not be less than 1m outside the crown projection.

10.2.1 Approved tree removal 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'.

10.3.1 Tree Protection Fence

Tree Protection fencing to be chain link fencing of 1.8m high, suitably clamped and braced to prevent sideways movement held in place with concrete feet.

Unless otherwise stated, the following activities must not be carried out within the TPZ:

- Modification of existing soil levels
- Cultivation of soil
- Movement of natural rock
- Storage of materials, plant, or equipment
- Preparation of chemicals, including preparation of cement products.
- Parking of vehicles and plant
- Refuelling
- Wash down and cleaning of equipment.
- Physical damage to tree

10.3 Signage - Tree Protection Zone

To be displayed around the edge of all TPZ fenced off areas and visible within the development site. To remind construction workers and sub-contractors Tree Protection Zone area is out of bounds.



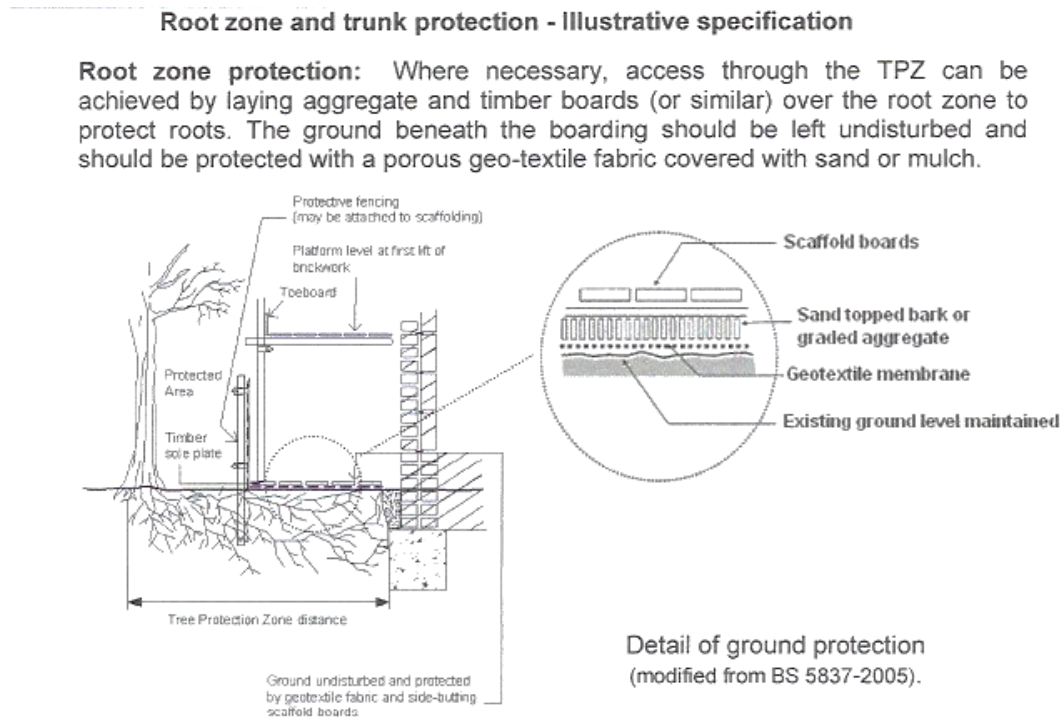
10.4 Mulch

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

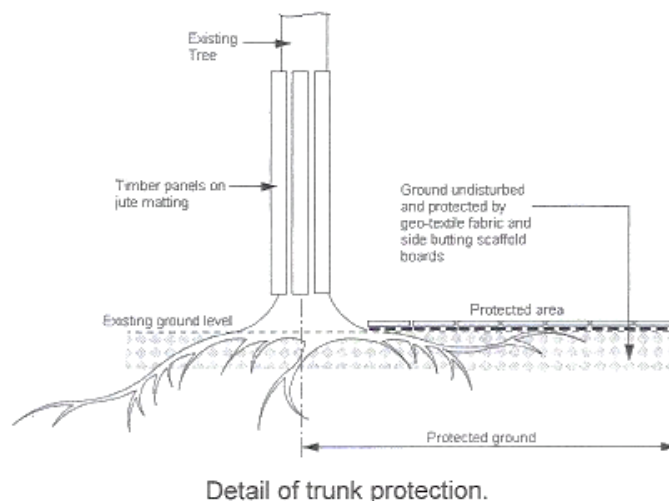
Hold Point: PRE-CONSTRUCTION - Prior to Site Clearance

Project Arborist to inspect Tree Protection Measures are compliant with *AS4970 Protection of Trees on Development Sites*.

Figure 1. Protection of the above and below ground parts of Trees.



Trunk protection: Where fencing cannot be installed, the vertical trunk of exposed trees shall be protected by the placement of 3.6m lengths of 50 x 100mm hardwood timbers, spaced vertically, at 150mm centres and secured by 2mm wire at 300mm wide spacing over suitable protective padding material e.g. Jute Matting. The trunk protection shall be maintained intact until the completion of all work on site.



10.5 Tree Protection Plan Construction Phase.

The following Tree protection measures are to be implemented during the construction phase of development.

10.5.1. Demolition and construction.

10.6 Temporary Infrastructure

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

10.7 Haul Route vehicles accessing site.

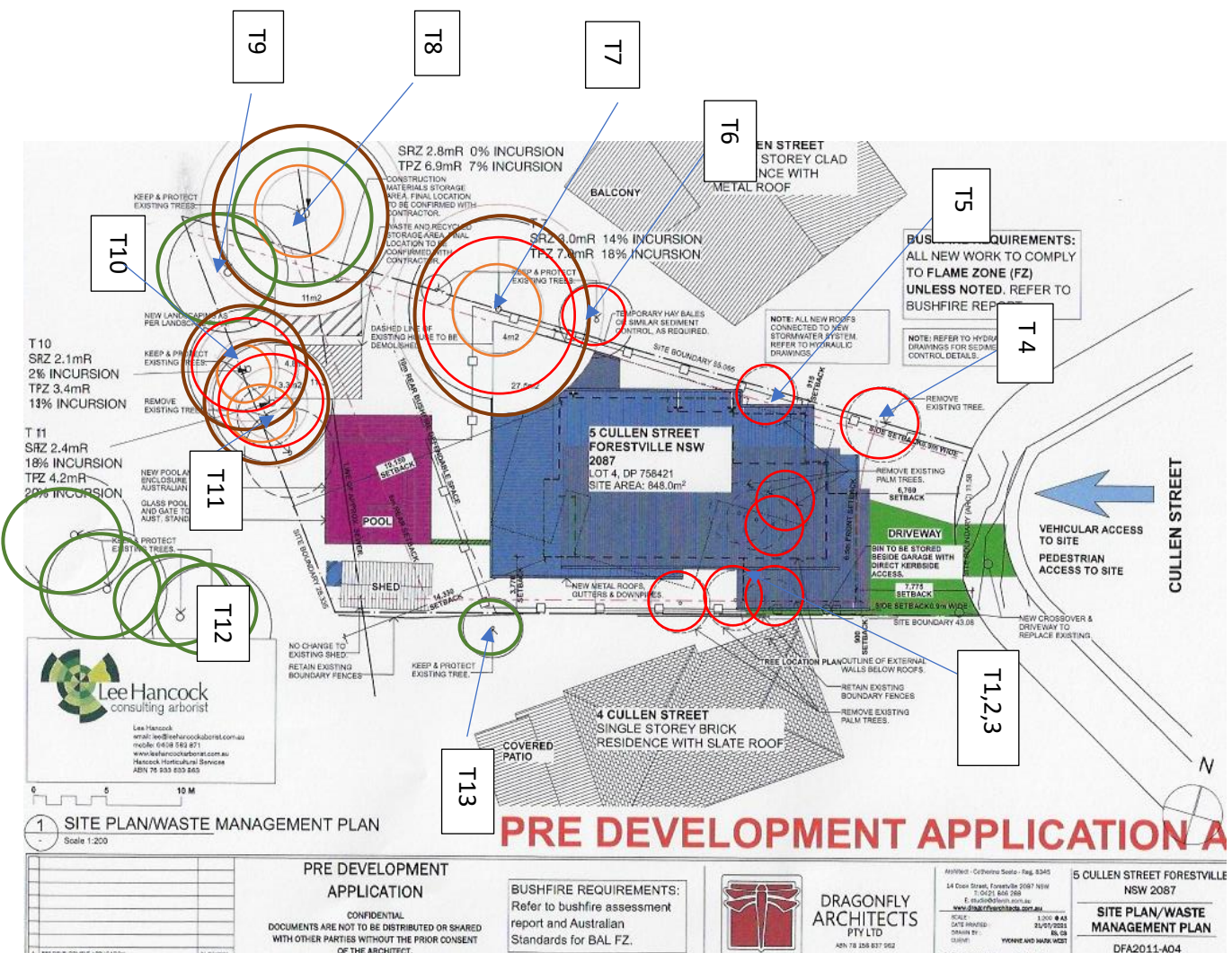
Haul route usage entry from Cullen Street.

10.8 Plant and Equipment

Light weight plant equipment such as small rubber tracked excavators and the demolition material for excavations removed to stockpiling area using small tipper trucks (2-3 tonne maximum), within 2 metres of a retained tree trunk.

Hold Point: Project Arborist inspection of Construction Phase.

Appendix A. Tree Location Plan



Appendix B. Tree Retention Management Plan

The Tree Protection Plan outlines and provides guidance on the principles of tree protection measures, to assist in protecting Trees onsite and offsite throughout all stages of the development. This information follows the Standards Australia AS4970-2009 *Protection of Trees on Development Sites*. Conditions will be documented, and compliance certificate issued to verify that all tree protection measures are compliant with Northern Beaches Council Development Consent.

To ensure that all tree protection measures are correctly installed in accordance with the approved development, a certificate from the appointed project arborist must be submitted to the Principal Certifying Authority and to be provided upon request from Council, confirming compliance with the tree protection requirements of consent.

- a) All tree protection zones for the trees to be retained must have a layer of wood-chip mulch installed prior to works commencing.
- b) The woodchip must be maintained throughout the period of construction at a depth of between 150mm and 300mm, using material that complies with the relevant requirements of AS 4454 – *Composts, soil Conditioners and Mulches*.

Works Near Trees

- a) The maintenance and monitoring of all tree protection techniques must be recorded by the appointed project arborist during the period of demolition and construction for submission with the application for the occupation certificate.
- b) The tree protection Zone of trees to be retained must be maintained by the project arborist in accordance with approved CEMP.
- c) **Root Pruning**

All root pruning must be undertaken in accordance with the relevant requirements of AS 4970- 2009 *Protection of Trees on Development Sites*.

d) Installation of Services

To minimise impact within the Tree Protection Zone (TPZ) of trees numbered identified on the Tree Location Plan. The installation of services must be undertaken as follows:

- i) The installation of any underground services which either enter or transect the designated TPZ must utilise sensitive methods such as manual excavation.
- ii) For manual excavation of trenches the project arborist must advise on roots to be retained. Manual excavation may include the use of pneumatic and hydraulic tools.

Final Certification Arborist

- a) The Project supervisor must submit to the principal certifying authority all relevant certificates with the application for the occupation certificate stating compliance with all conditions of this consent.
- b) The Project arborist must submit to the principal certifying authority a certificate that all the completed works have been carried out in compliance with the approved plans specifications for tree protection.

To ensure that protection measures are being adhered to during the pre-construction and construction stages there should be a predetermined number of site inspections carried out by Project Arborist.