

February 2012



**Arboricultural Impact Assessment
of Residential Alterations and Additions
15 Banksia Street, Dee Why**

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THIS PLAN TO BE READ IN
CONJUNCTION WITH

DA2012/0192

WARRINGAH COUNCIL

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Summary

This Arboricultural Impact Assessment (AIA) is based on five (5) trees located at 16 Banksia Street, Dee Why (subject site). The subject site is a low density residential lot occupied by an existing residential building situated towards the front of the site.

The assessed trees consisted of planted natives (non-locally indigenous) and planted exotics. Three (3) of the five (5) assessed trees are not protected by the WLEP 2011 as they are listed as exempt species and/or are less than 5 metres in height

Trees 1, 2 and 5 were assessed as having Medium Retention Values.

Tree 3 and 4 were assessed as having a Low Retention Values. Both these trees are recommended for removal and replacement with more suitable species.

Construction activity proposed within the Tree Protection Zones (TPZ) of the retainable subject trees includes:

- Front boundary wall and sliding gate (Trees 1 and 2)
- Retaining wall and swimming pool construction (Tree 2)

Recommendations have been made regarding measures required to limit the impact of these activities on the retained trees. If the recommendations are followed, the existing landscape amenity will be maintained with minimal or zero impact expected on tree health.

Introduction

Background

This Arboricultural Impact Assessment (AIA) was prepared for Jayne Temple in relation to five (5) trees with the potential to be impacted on by proposed works at 15 Banksia Street, Dee Why (subject site).

The purpose of this AIA is to assess the likely impacts of the proposed landscape upgrade works on existing site trees. Recommendations regarding construction methods and tree protection measures are provided in order to limit adverse impacts on trees recommended for retention.

This AIA has been prepared in accordance with the Australian Standard 4970-2009, *Protection of trees on development sites*. This AIA acknowledges the aims and objectives of the Warringah Council Local Environment Plan 2011(WLEP 2011)¹.

The Landscape Architect for this project is Space Landscape Designs.

Aims

- To evaluate the provided plans, assess and describe the potential impact of the proposal on each assessed tree.
- To provide recommendations regarding construction methods and tree protection measures in order to minimise or mitigate adverse impacts on trees recommended for retention.

Location

The subject site is a residential lot located at 15 Banksia Street, Dee Why. The site is currently occupied by a residential dwelling. The site is situated on the southern side of the road and is adjoined by a residential lot to the west and a reserve/easement to the east and south. The subject site has a gentle slope towards the north of the site.

Subject Trees

The subject trees consisted of both planted natives (non-locally indigenous) and planted exotics. Three (3) of the five (5) subject trees were located on adjoining council managed land. Trees 3 and 5 are not protected by the WLEP 2011 as they are listed as exempt species and Tree 4 is not protected as it is less than 5 metres in height. Refer to the Tree Assessment Details section for a further description of the subject trees.

¹The WLEP 2011 defines a tree as a palm or woody perennial plant greater than 5 metres in height and /or ten (10) metres in canopy width.

Methodology

Site Inspection

Site inspection was undertaken on the 1st of February, 2012. The following tree details were assessed from ground level using a Tree Assessment Table, which is included in the Tree Assessment Details section. The definitions and explanations of terms used are outlined in the Tree Table Definitions page which is included at Attachment A.

- Common Name/Genus Species
- Diameter at Breast Height (measured at 1.4 metres above ground) in metres
- Height (metres)
- Canopy Spread Radius (metres)
- Age Class (Immature, Semi-mature, Mature or Over-mature)
- Vigour (Good, Fair or Poor)
- Structural Condition (Good, Fair or Poor)
- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)
- Estimated Life Expectancy (Long, Medium, Short, Remove)
- Landscape and Environmental Significance (1, 2, 3, 4 or 5)
- Retention Value (High, Medium or Low)

Photographs and Diagrams

All photographs were taken on the 1st February 2012 using a digital camera. There were no image enhancements to photographs used within this document.

The Tree Protection Plan was drafted using the Site Plan as a base. This plan is included as Attachment B

Plans Reviewed

The following plans have been reviewed as part of this assessment:

- Plan Showing Boundaries, Relative Heights & Physical Features over Lot 105 in D.P.6167 Known as No. 15 Banksia Street, Dee Why, 17976, Bee and Lethbridge, 12/2/2011
- Landscape Plan/Elevation, L-02, Space Landscape Designs, 20/12/11

Consideration for Tree Retention and Removal

Where construction is proposed within the Tree Protection Zone (TPZ), specific construction design and monitoring will be required. Where construction is proposed outside the TPZ, no tree protection design or monitoring is required.

Tree removal recommendations have been based on tree Retention Values and construction offsets.

Trees are generally recommended for removal in the following circumstances:

- Trees located within construction/excavation footprints.
- Trees with construction proposed within SRZ where root loss cannot be avoided through sensitive design.
- Trees with a TPZ loss of more than 20%, are recommended for removal providing tree sensitive design cannot be implemented to avoid significant root and canopy loss.
- Trees with Retention Values of C can be recommended for removal irrespective of proposed development to allow suitable replacements in the context of a new development.

Tree Assessment Details

	Species	Diameter @ Breast Height (mm)	Height (m)	Canopy Spread Radius (m)	Age Class	Health	Structural Condition	Estimated Life Expectancy	Landscape and Environmental Significance (1-5)	Retention Value	Comments
1	Brushbox, <i>Lophostemon confertus</i>	430	8	4	Mature	Good	Good	Long (40+)	3	Medium	Minor cracking of footpath.
2	Brushbox, <i>Lophostemon confertus</i>	480	8	4.5	Mature	Good	Good	Long (40+)	3	Medium	Minor lifting of footpath.
3	Avocado, <i>Persea gratissima</i>	100	4	2	Mature	Fair	Fair	Short (5-15)	4	Low	Partially smothered by vine. WLEP 2011 exempt species.
4	Crab Apple, <i>Malus sp.</i>	200	4	4	Mature	Good	Good	Short (5-15)	4	Low	WLEP 2011 exempt.
5	Camphor Laurel, <i>Cinnamomum camphora</i>	810 @ 600mm a.g	13	8	Mature	Good	Good	Long (40+)	3	Medium	Canopy overhangs boundary by approx 3m. WLEP 2011 exempt.

Tree Protection Offsets based on AS4970-2009-Protection of Trees on Development Sites		
Tree Number	Tree Protection Zone (radius measured from centre of trunk)	Structural Root Zone (radius measured from centre of trunk)
1	5.2	2.3
2	5.8	2.4
3	2.0	1.5
4	2.4	1.7
5	9.7	3.0

Potential Impacts of Proposed Works

Potential Impacts of Proposal on Trees Recommended for Retention

Tree Number	Works proposed within the Tree Protection Zone	Retention Value
1	Construction of the front boundary wall and sliding gate is within the TPZ. Approximately 11% of the TPZ area of Tee1 will be impacted upon.	Medium
2	Construction of the front boundary wall is within the TPZ. Less than 5% of the TPZ area of Tree 2 will be impacted upon.	Medium
5	Excavation for swimming pool and retaining wall construction will impact on approximately 6 % of the TPZ area.	Medium

Trees recommended to be removed

Tree Number	Reason for Removal	Retention Value
3	Within footprint of proposed retaining wall. This tree is not protected by the WLEP 2011 due to being under 5m tall and an exempt species.	Low
4	Proposed retaining wall and re-graded levels within SRZ. This tree is not protected by the WLEP 2011 as it is under 5m tall.	Low

Recommendations

Recommended Construction Methods.

Construction of the front boundary wall and sliding gate (Trees 1 and 2): A shallow concrete strip footing will be required to support parts of the boundary wall and track for the sliding gate. Excavation for this footing must be undertaken by hand. The Site Arborist must be notified if any roots greater than 40mm diameter are encountered during excavation. Large roots may have to be bridged over by using a set of piers and lintel. Any roots smaller than 40mm diameter may be cleanly cut using a sharp saw.

Swimming pool and retaining wall construction (Tree 5): All excavation within the Tree Protection Zone of Tree 5 must be undertaken by hand within the top 800mm of soil depth. All roots encountered must be cleanly cut using a sharp hand saw. No impact on tree stability is expected given the large (>6 metre) offset between the tree and closest excavation. The impact to tree health is expected to be negligible given the less than 10% area of TPZ incursion.



Photo A: Approximate alignment of excavation required within the TPZ of Tree 5.

Installation of sub-grade services (All retained trees on site): It is often difficult to clearly establish the detail of services until the construction is in progress. Where possible, it is proposed to use the existing services into the site and keep any new services outside TPZs. Any excavation required within TPZ's must be carried out by hand.

Tree Protection Fencing and Trunk Battening

No Tree Protection Fencing or Trunk Battening will be required for Trees 1 and 2 as only minor works are required in this area of the site. No heavy vehicles or machinery will be required for front boundary wall

and gate construction. The existing boundary fencing should be considered to be Tree Protection Fencing for Tree 5.

Canopy Pruning

Crown reduction and Crown lifting as detailed in Sections 7.3.2 and 7.3.3 of Australian Standard AS4373-2007 "Pruning of Amenity Trees" may be required for the western side of the Tree 5 canopy, to reduce overhang of the proposed swimming pool. Less than 10% of the canopy area would need to be pruned to achieve this. As this tree is owned by Warringah Council, they must be contacted with a request to prune a tree located on public property. In most cases, if agreed to, this work would be undertaken by Council Contractors at Council expense. Refer to Photo B for further detail.



Photo B: Approximate area of canopy pruning that may be requested. Facing north.

Future Arborist Involvement and Certification

Given the likely low impact of the proposal on the surrounding trees, arborist involvement during the project may not be required. The Site Arborist should however be notified of any roots larger than 40mm diameter encountered.

Verification of tree protection at project completion may be required by the consent authority. If the consent conditions specify this, then the arborist must be invited on-site during boundary wall excavation to verify that tree roots are not significantly damaged.

Limitations

- The findings of this report are based upon and limited to visual examination of trees from ground level without any climbing, internal testing or exploratory excavation.
- This report reflects the health and structure of trees at the time of inspection. Bluegum cannot guarantee that a tree will be healthy and safe under all circumstances or for a specified period of time. There is no guarantee that problems or defects with assessed trees, will not arise in the future. Liability will not be accepted for damage to person or property as a result of failure of assessed trees.
- This report had been prepared for the exclusive use of the client. Bluegum does not accept any responsibility for its use by any other party.
- This report must be read in its entirety. No part of this report may be referred to, verbally or in writing, unless taken in full context of the whole report.

Attachment A- Tree Table Definitions

COMMON NAME/GENUS SPECIES CULTIVAR. Common names can vary with selected texts. Where species is unknown, "sp." is indicated after genus

HEIGHT. Tree height estimated from ground level. This assessment is made independently of data plotted on survey plan. These measurements have not been confirmed with clinometer or other surveying instrument.

DBH - Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape used which assumes a circular cross section.

Multiple measurements indicate multiple trunks. More than three trunks are indicated as "multi". Where DBH measurement cannot be taken at 1.4m the height at which it has been taken is indicated.

CANOPY SPREAD RADIUS. Average canopy spread radius is taken from the centre of trunk to the outer edge of canopy. Refer to Comments column for detail of heavily skewed canopy spread.

AGE CLASS - Immature (IM), Semi-mature (SM), Mature (M), Over-mature (OM). Assessment of the tree's current Age. A Mature (M) tree has reached a near stable size (biomass) above and below ground. Trees can have a Mature Age Class for >90% of life span. Over-mature (OM) trees show symptoms of irreversible decline and decreasing biomass.

VIGOUR - Good (G), Fair (F) or Poor (P). The general appearance of the canopy/foilage of the tree at the time of inspection. Vigour is an indication of tree health. Vigour can vary with the season and rainfall frequency. A tree can have Good Vigour but be hazardous due to Poor Condition.

STRUCTURAL CONDITION - Good (G), Fair (F) or Poor (P). The general form and structure of the trunk/s and branching. Condition is an assessment of tree structure and stability. Trunk lean, trunk/branch structural defects, canopy skew and other hazard features are considered.

TREE PROTECTION ZONE (TPZ). Based Radial offset (m) of twelve times (12X) trunk DBH measured from centre of trunk. Rounded to the nearest 0.1 metre. A TPZ should not be less than 2m or greater than 15m. The TPZ for palms and other monocots should not be less than 1m outside of the crown projection. For multi-trunked trees TPZ is calculated by using the DBH for the largest trunk plus half of the DBH for the next largest trunk. Existing constraints to root spread can vary TPZ. To satisfactorily retain the tree construction activity (both soil cut and fill) should be restricted within these offsets. A TPZ incursion of up to 10% could be considered acceptable given that undisturbed soil is available on other axis.

Based upon the Australian Standard AS 4970, 2009, *Protection of trees on development sites* and the Matheney & Clarke "Guidelines for adequate tree preservation zones for healthy, structurally stable trees"

STRUCTURAL ROOT ZONE (SRZ). THIS OFFSET IS APPLICABLE ON ONE AXIS ONLY AND ONLY WHERE UNDISTURBED ROOT GROWTH WITHIN TPZ IS POSSIBLE ON THE OTHER 3 AXIES. It is a radial offset based on the following formula- $SRZ = (DBH \times 50)^{0.42} \times 0.64$ (for trees less than 150mm DBH, a minimum SRZ of 1.5 metres). SRZ offsets are rounded to the nearest 0.1m. For multi-trunked trees SRZ is calculated by using the DBH for the largest trunk plus half of the DBH for the next largest trunk. The SRZ formula does not apply to palms or other monocots.

Within this offset woody roots are usually encountered, disturbance to which can cause tree instability. Fully elevated construction is possible within SRZ with specific rootzone assessment. Existing constraints to root spread can vary SRZ. This method of determining SRZ is outlined at Section 3.3.5 of Australian Standard AS 4970, 2009, *Protection of trees on development sites*.

ESTIMATED LIFE EXPECTANCY (ELE). Based upon the system of pre-development tree assessment procedure known as Safe Useful Life Expectancy (SULE) developed by Jeremy Barrell, Hampshire, England. The SULE method was derived from the British Standard, BS 5837, 1991, *Guide for trees in relation to construction*. This simplified method gives a length of time that the Arborist feels a particular tree can be retained with an acceptable level of risk based on the information available at the time of the inspection. ELE

ratings are **Long** (retainable for 40 years or more with an acceptable level of risk), **Medium** (retainable for 16-39 years), **Short** (retainable for 5-15 years) and **Removal** (tree requiring immediate removal due to imminent hazard or absolute unsuitability).

LANDSCAPE AND ENVIRONMENTAL SIGNIFICANCE –Rating Scale. A site specific evaluation of a tree relative to the existing landuse. Takes into consideration the impact of the tree on the surrounding landscape, streetscape or bushland. Rarity, habitat value, historical and cultural significance of the tree are considered in this rating system. The significance ratings used in this Report are:

- 1 **Most Significant.** This is a standout specimen that holds irreplaceable specific environmental, landscape or cultural value.
- 2 **Highly Significant.** An excellent specimen that holds environmental, landscape or cultural value that is present in other site trees or that could be replaced.
- 3 **Less Significant.** Can be a good specimen, however if reasonable development is to be confined because of its retention it can be considered for removal.
- 4 **Least Significant.** Removal would not result in any loss of site amenity or environmental value. Can include weed species.
- 5 **Dead or Hazardous with no other environmental or cultural value.** Should be removed or pruned in a way to make safe irrespective of any development.

RETENTION VALUE. Retention value rating scale of High, Medium or Low. Retention values are derived from a combination of Estimated Life Expectancy rating and Landscape and Environmental Significance using the table below.

Estimated Life Expectancy		Land & Env Significance				
		1	2	3	4	5
	Long	High	Medium			
	Medium					
	Short	Medium	Low			
	Removal					

Retention Value High: Warrants retention and major design consideration to ensure this (e.g. placement of building footprint, alignment of roadway).

Retention Value Medium: Warrants retention and minor design consideration to ensure this (effort should be made to retain these trees wherever possible).

Retention Value Low: These trees should not be considered to be a constraint to design layout. Some of these trees should be removed irrespective of any proposed development.

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Attachment B- Tree Protection Plan

EXISTING PALM TO BE RETAINED.
CLIMBER ON FENCE BEHIND T.J (1)
POOL EQUIPMENT LOCATED IN
SOUNDPROOF ENCLOSURE

RELOCATE EXISTING
GATE & REVERSE SWING
NEW SOFT LEAF BUFFALO
TURF WITH FLUSH TIMBER
GARDEN EDGING

REMOVE CRABAPPLE TREE

NEW STAIRS UP TO UPPER LEVEL



Tree Protection Plan

15 Banksia Street, Dee Why

This plan is to be read in conjunction with the Arboricultural Impact Assessment (AIA) report prepared for this site, February 2012

Tree Protection Zones plotted on this plan are indicative only. Refer to the AIA for all measurements and dimensions

LEGEND

Tree Protection Zone of Retained Tree



Tree recommended for removal



T4

T3

T1

T2

T5

PROPOSED POOL
AREA: 24m²
APPROX. VOL. 30,000L
P.L. 27.00

D.E.
1.8

LOW WALL TO FACILITATE CUT
FOR POOL. WALL TO RETURN
TO NATURAL GROUND LEVEL

TRANSPLANT EXISTING LILLYS AS
SCREEN PLANTING BETWEEN POOL &
BOUNDARY AT NEW GROUND LEVELS

1200mm (H) POOL FENCE BETWEEN
BOUNDARY FENCE & 1800mm (H)
UPFRANG WALL & TIMBER DISCENT

LG (19)
HS (2)
PA (1)
BN (3)

TOW RL 26.93
POOL FENCE RETURNS TO
BOUNDARY FENCE OVER
RETAINING WALL. TOW RL 27.00

SWIM JETS TO THE DEEP END
& SWIMOUT LEDGE OPPOSITE

WATER FEATURE WITH CONCEALED
CATCHMENT TROUGH SET IN GRAVEL

DRAINAGE PIT AT EXISTING LEVELS

CLIMBING PLANTS TRAINED OVER FENCE ON
WIRE RUNNERS. T.J (2) TIMBER RETAINING WALL
UNDER FENCE AS REQUIRED. TOW RL 26.26

STEPPED MASONRY PLANTER FOR
HERBS & VEGETABLES. TOW RL 26.52
& TOW RL 26.98. CLIMBING PLANTS TO
CASCADE OVER TOP WALL. T.J (5)

CONCRETE

GARDEN

NEW 1800mm (H) TIMBER FENCE

NEW PIER & DWARF WALL WITH
TIMBER INFILL. MAX HEIGHT
1800mm. SLIDING GATE TO MATCH
TIMBER INFILL DETAIL OF FENCE

LEGEND

BOUNDARY

SEWER

TIMBER EDGE

CONCRETE

STEPPERS IN PEBBLES

EXISTING TURF

PROPOSED TURF

PROPOSED TREE / PALM

TREE / PALM TO BE RETAINED

TREE TO BE REMOVED

ELEVATION AA
SCALE 1:100

BOUNDARY LINE

NEW PIER & DWARF RENDERED WALL
PAINTED TO MATCH HOUSE DETAIL.
TIMBER INFILL. MAX HEIGHT 1800mm

EXISTING DRIVEWAY CROSS OVER

BOUNDARY LINE

NEW PIER & DWARF WALL WITH
TIMBER INFILL. MAX HEIGHT 1800mm

EXISTING LEVELS AT FRONT
BOUNDARY TO BE RETAINED

PROPOSED PLANT SCHEDULE

KEY	BOTANICAL NAME	COMMON NAME	QTY	MATURE HGT	POT SIZE
TREES					
AC	ARCHONTOPHOENIX CUNNINGHAMIANA	BANGALOW PALM	1	8m	45Ltr
CA	CLUPANOPSIS ANACARDIOIDES	TUCKEROO	1	8m	45Ltr
PA	PLUMERIA ACUTIFOLIA	FRANGIPANI	1	5m	75Ltr
SHRUBS					
BN	BLECHNUM NUDUM	FISHBONE WATER-FERN	6	1m	200mm
CR	CORYLIAE FRUTICOSA 'RUBRA'	RED T. PLANT	3	3m	200mm
GF	GARDENIA AUGUSTA 'FLORIDA'	GARDENIA	5	1m	200mm
IC	IXORA CHINENSIS 'PRINCE OF ORANGE'	PRINCE OF ORANGE	3	2m	200mm
HS	HELICONIA STRICTA	SMALL LOBSTER CLAW	5	1.5m	300mm
GRASSES / GROUND COVERS					
CM	CLIVIA MINIATA	KAFFIR LILY	10	1.5m	100mm
CP	CRYNTHUM PEDUNCULATUM	RIVER LILY	10	1.5m	100mm
LJ	LIRIOPE MUSCARI 'EVERGREEN GIANT'	GIANT LIRIOPE	10	1.5m	100mm
TJ	TRACHELOSPERMUM JASMINOIDES	STAR JASMINE	10	1.5m	200mm

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Rev	Date	By	Checked
A	20/12/11	Preparatory	AE



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DEE WHY

Scale: 1:100 @ A2
Project No: 11703
Drawing No: L-02 of 4
ELEVATION
A