ARBORICULTURAL IMPACT REPORT

101 BUNGAN HEAD ROAD NEWPORT BEACH NSW

6 JUNE 2016

PREPARED FOR NORTH SHORE BUILDING DESIGN GROUP





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1. BACKGROUND

Landscape Matrix Pty Ltd has been engaged by North Shore Building Design Group to prepare an Arboricultural report in respect to 3 trees potentially affected by a proposed new driveway and carport at 101 Bungan Head Road Newport Beach (the site). The trees assessed for this report are located in the front garden area of the site.

This report has been prepared by Guy Paroissien a Director of Landscape Matrix Pty Ltd. The site was inspected on 24th May 2016. The assessment of the trees was based upon a visual inspection of the trees from ground level using elements of the Visual Tree Assessment (VTA) approach developed by Mattheck & Breloer (1994). The visual inspection included examination of the trees' dimensions, foliage density and foliage health, form, structure, structural condition, overall health and vigour and landscape significance.

The inspection was limited to visual inspection of the trees without dissection, probing or coring. No aerial inspection of the trees was carried out and the assessment did not include any woody tissue testing or subterranean root investigation.

The tree heights and canopy spreads were estimated and expressed in metres and the tree diameters at breast height (DBH) were measured with a standard metal tape at approximately 1.4 metres above ground level and expressed in millimetres. The DBH for trees on adjoining properties was estimated from the nearest boundary.

Measurements from the trees referred to in this report are to be taken as if measured from the centre of the trees' trunks.

2. TREES ASSESSED FOR THIS REPORT

Three mature trees have been assessed in preparing this report. The trees assessed for this report are located in the front garden area of the site. The location and context of the site is illustrated in the photograph on the cover page of this report.

A summary of these trees, their dimensions, condition, Useful Expectancy (ULE) and landscape significance is attached in Appendix B. The ULE categories identified in Appendix B follow those of Barrell (1996).

The locations of the trees are shown on the attached Site Plan prepared by North Shore Building Design Group dated April 2016 and identified as Drawing Number 01616-16. The three trees are summarised in table 1 as follows:

Tree	Species and	Summary
No.	Common Name	
1	Acer Beurgerianum	A mature, multi trunked specimen approximately 9 metres in height with a canopy spread of 9 metres and diameters at
	(Trident Maple)	breast height (DBH) of up to 290mm (360 x 420mm above the root flare). In good health and of moderate landscape
		significance.
		At the time of inspection the tree exhibited low levels of dieback - typical for age and species.
2	Leptospermum	A mature, multi trunked specimen approximately 8 metres in height with a canopy spread of 6 metres and DBH of up
	<i>laevigatum</i> (Coast Tea	to 170mm (340mm above the root flare). In moderate health and of low landscape significance.
	Tree)	The tree's past canopy development has been suppressed. The tree displays fair to poor branch attachment with
		multiple leaders from 1 metre with evidence of poor attachment at the junction - the junction is a weak point in the tree
		with increased risk of failure. At the time of inspection the tree was of moderate health and fair vigour and exhibited
		significantly reduced foliage density and moderate to high levels of dieback.
3	Michellia figo (Port	A mature, multi trunked specimen approximately 3.5 metres in height with a canopy spread of 3.5 metres and DBH of
	Wine Magnolia)	up to 55mm (160 x 220mm above the root flare). In good health and of low landscape significance.
		The tree's past canopy development has been suppressed.

Table 1: Summary of trees assessed at 101 Bungan Head Road Newport

None of the trees assessed for the report is listed individually as a threatened species on the Schedules of the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

3. IDENTIFICATION OF SETBACKS FOR THE TREES

A number of methods to determine the likely extent of root zones and appropriate setbacks for tree root protection zones for trees on development sites have been developed in the past. The key criteria used in determining setbacks is the tree's trunk diameter at breast height (DBH) in conjunction with other factors including the sensitivity of the species in question to environmental disturbance/change, the age of the tree and the tree's health and vigour at the time.

Harris et al (2004) provide formulae for calculating tree protection zones based on the above criteria and modified from the 1991 British Standard for protection of trees on construction sites (BS 5837:1991). The 2005 version of the British Standard (BS 5837:2005) recommends a radius of 12 times the tree's DBH. For multi trunked trees BS 5837:2005 recommends a setback of 10 times the basal trunk diameter.

The Australian Standard AS 4970-2009 Protection of Trees on Construction Sites also identifies a 'Tree Protection Zone' of 12 times the tree's DBH. The Australian Standard also provides a formula for calculating the "Structural Root Zone' of trees on development sites.

The tree protection zones identified below have been calculated using the Australian Standard AS 4970 Protection of Trees on Construction Sites and are the optimum setback from the trees where disturbance (e.g. soil level changes, compaction, excavation etc) should be minimised to reduce potential impacts on the long term health of the trees.

Tree No.	Species and Common Name	Tree Protection Zone	Structural Root Zone		
1	Acer Beurgerianum (Trident Maple)	4.7 metres	2.2 metres		
2	Leptospermum laevigatum (Coast Tea Tree)	4.1 metres	2.1 metres		
3	Michellia figo (Port Wine Magnolia)	2.3 metres	1.6 metres		

Table 2: Tree Protection Zones – 101 Bungan Head Road Newport

AS4970-2009 identifies that, preferably, no more than 10% of the tree protection zone should be disturbed with compensation made by extension of other areas of the TPZ to compensate for the area(s) disturbed. Where greater than 10% of the tree protection zone is potentially disturbed the tree's viability needs to be investigated and demonstrated by the project arborist. The structural root zone is the area required for stability and where disturbance of any sort should be avoided.

4. POTENTIAL IMPACTS ON THE TREES

The impacts have been assessed using the Site Plan prepared by North Shore Building Design Group dated April 2016 and identified as Drawing Number 01616-16.

The extent of impacts to the trees has been rated using the following guideline: 0% of TPZ impacted – no impact of significance 0 to 10% of TPZ impacted – low level of impact 10 to 15% of TPZ impacted – low to moderate level of impact 15 to 20% of TPZ impacted – moderate level of impact 20 to 25% of TPZ impacted – moderate to high level of impact 25 to 35% of TPZ impacted – high level of impact >35% of TPZ impacted – significant level of impact

The tree protection zone calculations referred to in table 3 were made using scale drawings of the trees' identified tree protection zones (TPZ) in a CAD program (TurboCAD®) with potentially affected areas added to the drawing. The area of potential impact was converted to a percentage of TPZ using a spreadsheet (Microsoft Excel®). The extent of potential impacts to the trees is summarised in the table 3 as follows:

Tree	Species and Common Name	Summary
No.		
1	Acer Beurgerianum (Trident Maple)	 The proposed driveway is located 0.8 metres from the tree at the closest point and is calculated to encroach within 27.36m² or 39.78% of the tree's identified TPZ – this is a significant level of encroachment. However, the actual impacts will be significantly reduced due to the following: The driveway is to be an elevated driveway above existing grade; Around 1/3 of the area potentially impacted is already a concrete driveway; The existing concrete driveway in this area will be converted to soft landscape area; and Past pruning of lower branches to around 3 metres will minimise the need to prune the canopy for driveway clearance. Taking these factors into consideration it is considered the potential impacts will be within an acceptable threshold.
2	<i>Leptospermum laevigatum</i> (Coast Tea Tree)	The tree is identified to be removed as part of the works.
3	Michellia figo (Port Wine Magnolia)	The tree is identified to be removed as part of the works.

Table 3: Summary of potential impacts on the trees – 101 Bungan Head Road Newport

The potential impacts can be summarised as follows:

While the proposed works will impact on a significant area of the TPZ of tree number 1, the actual impacts will be significantly reduced due to the following:

- The driveway is to be an elevated driveway above existing grade;
- \circ Around 1/3 of the area potentially impacted is already a concrete driveway;

- The existing concrete driveway in this area will be converted to soft landscape area; and
- Past pruning of lower branches to around 3 metres will minimise the need to prune the canopy for driveway clearance.
- Taking these factors into consideration it is considered the potential impacts to tree number 1 will be within an acceptable threshold.
- Tree numbers 2 and 3 are proposed to be removed as part of the works.

5. TREE PROTECTION MEASURES

The following generic tree protection measures are recommended to assist in minimising potential impacts to other trees that may be proposed for retention on the site.

A. Measures to be implemented prior to the commencement of any works on the site.

1. Trees to be retained are to be clearly identified by signage as protected trees.

2. The tree protection zones of trees to be retained are to be protected by fencing during the entire construction period except for specific areas directly required to achieve construction works.

3. The tree protection fence shall be constructed of galvanised pipe at 2.4 metre spacing and connected by securely attached chain mesh fencing to a minimum height of 1.8 metres and shall be installed prior to work commencing.

4. The tree protection fencing shall be installed as closely as possible to the alignment of the identified tree protection zone and shall be approved and certified by the site arborist prior to commencement of any construction or demolition works on the site.

B. Measures to be implemented and maintained during the life of construction works on the site.

5. Any excavation within the identified root protection zones of trees to be retained shall be carried out by hand to minimize disturbance to tree roots. Roots greater than 25mm are not to be damaged or severed without prior assessment by an arborist to determine likely level of impact and the restorative actions required to minimise the impacts of root damage.

6. Tree roots between 10mm and 25mm diameter, severed during excavation, shall be cut cleanly by hand by an experienced Arborist/Horticulturist with a minimum qualification of the Horticulture Certificate or Tree Surgery Certificate.

7. The following activities/actions are prohibited from the tree protection zones:

- Soil cut or fill including excavation and trenching
- Soil cultivation, disturbance or compaction
- Stockpiling storage or mixing of materials
- The parking, storing, washing and repairing of tools, equipment and machinery
- The disposal of liquids and refueling
- The disposal of building materials
- The sitting of offices or sheds
- Any action leading to the impact on tree health or structure

8. Canopy pruning of trees identified for protection which is necessary to accommodate approved building works shall be undertaken in accordance with Australian Standard 4373-2007 'Pruning of Amenity Trees'.

6. CONCLUSION

Three mature trees have been assessed for this report. The trees comprise a mix of planted exotic specimens (tree #s 1 and 3) and planted Australian species (Tree # 2). The trees are located in the front garden area of the site.

The trees were generally of good health at the time of inspection and did not exhibit any visual evidence of significant pest or disease. However, tree number 2 was of moderate health and fair vigour and exhibited significantly reduced foliage density and moderate to high levels of dieback

The potential impacts can be summarised as follows:

While the proposed works will impact on a significant area of the TPZ of tree number 1, the actual impacts will be significantly reduced due to the following:

- The driveway is to be an elevated driveway above existing grade;
- Around 1/3 of the area potentially impacted is already a concrete driveway;
- The existing concrete driveway in this area will be converted to soft landscape area; and
- Past pruning of lower branches to around 3 metres will minimise the need to prune the canopy for driveway clearance.
- Taking these factors into consideration it is considered the potential impacts to tree number 1 will be within an acceptable threshold.
- Tree numbers 2 and 3 are proposed to be removed as part of the works.

Generic tree protection measures are identified in section 5 of the report to identify measures that could be used to assist in minimising potential impacts to trees on and adjacent to the site that are proposed for retention.

Guy Paronn

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Harris et al (2004). Harris RW, Clark JR, Matheny NP: Arboriculture – Integrated Management of Landscape Trees Shrubs and Vines 4TH Edition. Prentice Hall, New Jersey 07458.

Mattheck & Breloer (1994) – The Body Language of Trees – a handbook for failure analysis - Research for Amenity Trees No. 4. Published by TSO (The Stationary Office) Norwich UK.

North Shore Building Design Group (2016) - Site Plan prepared by North Shore Building Design Group dated April 2016 and identified as Drawing Number 01616-16.

APPENDIX A



Photograph 1: Tree # 1 – Illustrating the existing driveway layout and the tree.



Photograph 2: Tree # 1 – Illustrating the area of past canopy raising that will minimise the need to prune the canopy for the driveway access.

Arboricultural Impact Report – 101 Bungan Head Road Lindfield Prepared by Landscape Matrix Pty Ltd - Issue A – 6 June 2016



Photograph 3: Tree # 2 – Illustrating the reduced foliage density and moderate to high levels of dieback.



Photograph 4: Tree # 2 – Illustrating the multiple leaders from 1 metre with evidence of poor attachment at the junction.

Tree	Conus Species	Hoight	Conony	DBU	DBH (or	DCI (or	Foliogo			Trunk	Groum			Branch			Dood			Landosono	Potentian	
No.	(Common Name)	(m)	(m)	(mm)	TPZ	SRZ	Condition	Age Class	Trunk	Lean	balance	Past Pruning	Stability	Attachment	Health	Vigour	Wood	Pest or disease	ULE	Significance	Value*	Comments
1	Acer Beurgerianum (Trident Maple)	9	9	Up to 290 (360 x 420 above root flare)	390	390	Good foliage condition	Mature	Multi trunked	Upright trunk	Balanced canopy area	Lower limbs pruned in past to 3 metres	Appears	Sound branch attachment	Good health	Good	5%	No visual evidence of significant pest or disease	1 Long (> 40 years)	Moderate landscape significance	2	At the time of inspection the tree exhibited low levels of dieback - typical for age and species.
2	Leptospermum laevigatum (Coast Tea Tree)	8	6	Up to 170 (340 above root flare)	340	340	Fair foliage	Mature	Multi	Upright	Majority of canopy to the NE	Lower limbs pruned in past to 2 metres	Appears	Fair to poor branch attachment	Moderate	Fair	10 to 15%	No visual evidence of significant pest or disease	3 Short (5 to 15 years)	Low landscape significance	3	The tree's past canopy development has been suppressed. The tree displays fair to poor branch attachment with multiple leaders from 1 metre with evidence of poor attachment at the junction - the junction is a weak point in the tree with increased risk of failure. At the time of inspection the tree was of moderate health and fair vigour and exhibited significantly reduced foliage density and moderate to hinb levels of diehack.
3	Michellia figo (Port	35	35	Up to 55 (160 x 220 above root flare)	190	190	Good foliage	Mature	Multi	Upright	Majority of canopy to the west	No evidence of significant past	Appears	Sound branch	Good	Good	<5%	No visual evidence of significant pest or disease	2 Medium (15 to 40 vears)	Low landscape	3	The tree's past canopy development has been
ca = a	approximate diameter at	5.5 breast he	eiaht (DBF) estimat	ed from ne	earest pro	perty bounda	rv or fence v	vhere tree	s were lo	cated on adio	pining properties	SLAUIC	auauninent	ncaiul	Ngodi	~ 3%	UI UISCASE	ycais)	Signification	3	Suppresseu.
* Rete	Retention Values: 1 - High (Priority for retention): 2 - Moderate (Consider for retention): 3 - Low or short ULE (Not warranting specific design consideration) and 4 - Remove (very short ULE, structurally unsound, weed species etc.)																					

APPENDIX B - TREE DATA SUMMARY - 101 BUNGAN HEAD ROAD NEWPORT BEACH



NO WORK IS TO COMMENCE UNTIL A CONSTRUCTION CERTIFICATE HAS BEEN ISSUED

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