ARBORICULTURAL IMPACT REPORT

67 PALMGROVE ROAD
AVALON BEACH NSW

PREPARED FOR DON ROBERTSON

1ST AUGUST 2016

Prepared by:
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1. BACKGROUND

Landscape Matrix Pty Ltd has been engaged by Don Robertson to prepare an Arboricultural Impact Report in respect to a tree at 67 Palmgrove Road Avalon Beach (the site). The tree is potentially impacted by proposed additions to the dwelling.

The tree is located in the front garden of the adjoining property to the NE of the site. The location and context of the site and tree is illustrated in the photograph on the cover page of this report.

This report has been prepared by Guy Paroissien a Director of Landscape Matrix Pty Ltd.

The site was inspected on 28th July 2016. The assessment of the tree is based upon a visual inspection of the tree from ground level using elements of the Visual Tree Assessment (VTA) method described by Mattheck & Breloer (1994). The Useful Life Expectancy (ULE) category identified in the report follows Barrell (1996).

The visual inspection included examination of the tree's 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 tree without dissection, probing or coring. No aerial inspection of the tree was carried out and the assessment did not include any woody tissue testing or subterranean root investigation.

The tree height and canopy spread were estimated and are expressed in metres and the tree diameter at breast height (DBH) was estimated from the nearest boundary at approximately 1.4 metres above ground level and is expressed in millimetres.

Measurements from the tree referred to in this report are to be taken as if measured from the centre of the tree's trunk.

2. TREE ASSESSED FOR THIS REPORT

One Spotted Gum has been assessed in preparing this report. The tree is located in the front garden of the adjoining property to the NE of the site.

2.1 Observations regarding the tree

The tree is a mature, single trunked *Corymbia maculata* (Spotted Gum) approximately 28 metres in height with a canopy spread of 16 metres and a diameter at breast height (DBH) of ca. 800mm. The trunk diameter at ground level is ca. 950mm.

The tree has an upright trunk and the majority of its past canopy development has been balanced. At the time of inspection the tree was of good health and vigour with less than 5% dieback in the crown. There was no visual evidence of significant pest or disease at the time of inspection.

The tree currently appears stable with no evidence of movement, soil cracking/heaving etc. (as viewed from within 67 Palmgrove Road). The tree displays fair branch attachment with no evidence of significant past branch failures. A large diameter branch has been pruned in the past at 12 metres on the NW side (over the site).

The tree is of high visual significance as viewed from street frontage and is of high landscape value. Taking into account the tree's age, health, vigour and species it is concluded the tree has a long Useful Life Expectancy (ULE), i.e. > 40 years.

2.2 Observations regarding the site conditions in the vicinity of the tree

The tree is located in the front garden of the adjoining property to the NE of the site. There is a combination of the following within the tree's identified tree protection zone (TPZ):

- Garden and lawn areas in the front garden of the site and adjoining property to the NE; and
- Driveway and carport in the front garden the site and existing dwelling and deck areas in the adjoining property to the NE.

Observations regarding the tree and site conditions are illustrated in photographs 1, 2, 3 and 4 in Appendix A.

3. IDENTIFICATION OF SETBACKS FOR THE TREE

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 *AS4970-2009 Protection of Trees on development Sites* also identifies a 'Tree Protection Zone' (TPZ) 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.

In regard to palms, other monocots, cycads and tree ferns the Standard identifies the Tree Protection Zone should not be less than 1 metre outside the crown projection. (Australian Standards Association 2009)

Using the formulae provided in *AS4970-2009* the tree protection zone for the tree is calculated as 9.6 metres and its structural root zone is calculated as 3.2 metres.

The tree protection zone identified above is the identified setback from the tree where disturbance (e.g. soil level changes, compaction, excavation etc.) should be minimised to reduce potential impacts on the long term health of the tree.

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 TO THE TREE

The impacts have been assessed using the following plans:

- The Site Plan prepared by JD Evans and Company dated 1/9/2015 and identified as Drawing Number 1779-1.

The extent of impacts to the tree has been rated using the following guideline:

0% of root zone 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 TPZ calculations referred to below were made using scale drawings of the trees' identified 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 proposed deck is located 1.8 metres from the tree at the closest point and is calculated to encroach within 42.77m^2 or 14.78% of the tree's identified tree protection zone (TPZ) – this is a low to moderate level of encroachment and within an acceptable threshold for the tree.

The proposed addition to the dwelling is located 6.9 metres from the tree at the closest point and is calculated to encroach within a further 7.55m^2 or 2.61% of the tree's

identified TPZ – this is a low level of encroachment and within an acceptable threshold for the tree.

The cumulative encroachment is 17.39% of the TPZ and is a moderate level of impact and within an acceptable threshold. In addition, the impacts will be significantly reduced as both the addition to the dwelling and the deck are elevated structures supported by isolated piers. It is recommended that the deck surface be designed to enable rainfall inception to the soil below to minimise changes to drainage to the tree's TPZ.

5. CONCLUSION

The tree assessed for this report is a mature, single trunked Corymbia maculata (Spotted Gum) approximately 28 metres in height with a canopy spread of 16 metres and a diameter at breast height (DBH) of ca. 800mm. The tree is located in the front garden of the adjoining property to the NE of the site.

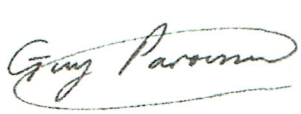
The tree has an upright trunk and the majority of its past canopy development has been balanced. At the time of inspection the tree was of good health and vigour with no visual evidence of significant pest or disease at the time of inspection.

The tree is of high landscape value with a long Useful Life Expectancy (ULE), i.e. > 40 years.

The cumulative encroachment of the proposed deck and addition to the dwelling is 17.39% of the tree's TPZ and is a moderate level of impact and within an acceptable threshold. In addition, the impacts will be significantly reduced as both the addition to the dwelling and the deck are elevated structures supported by isolated piers.

It is recommended that the deck surface be designed to enable rainfall inception to the soil below to minimise changes to drainage to the tree's TPZ.

Due to the proximity of works and the foreseeable need for construction access within the tree's SRZ and TPZ the installation of trunk and ground protection is recommended. This protection will need to be installed prior to commencement of any works at the site and in accordance with the protection measures identified in Figure 4 of AS4970-2009. (Appendix B).



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1st August 2016

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Australian Standards Association (2009) AS 4790- 2009 - Australian Standard 4790-2009 'Protection of trees on development sites'.

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.

JD Evans and Company (2015) - The Site Plan prepared by JD Evans and Company dated 1/9/2015 and identified as Drawing Number 1779-1.

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.

APPENDIX A

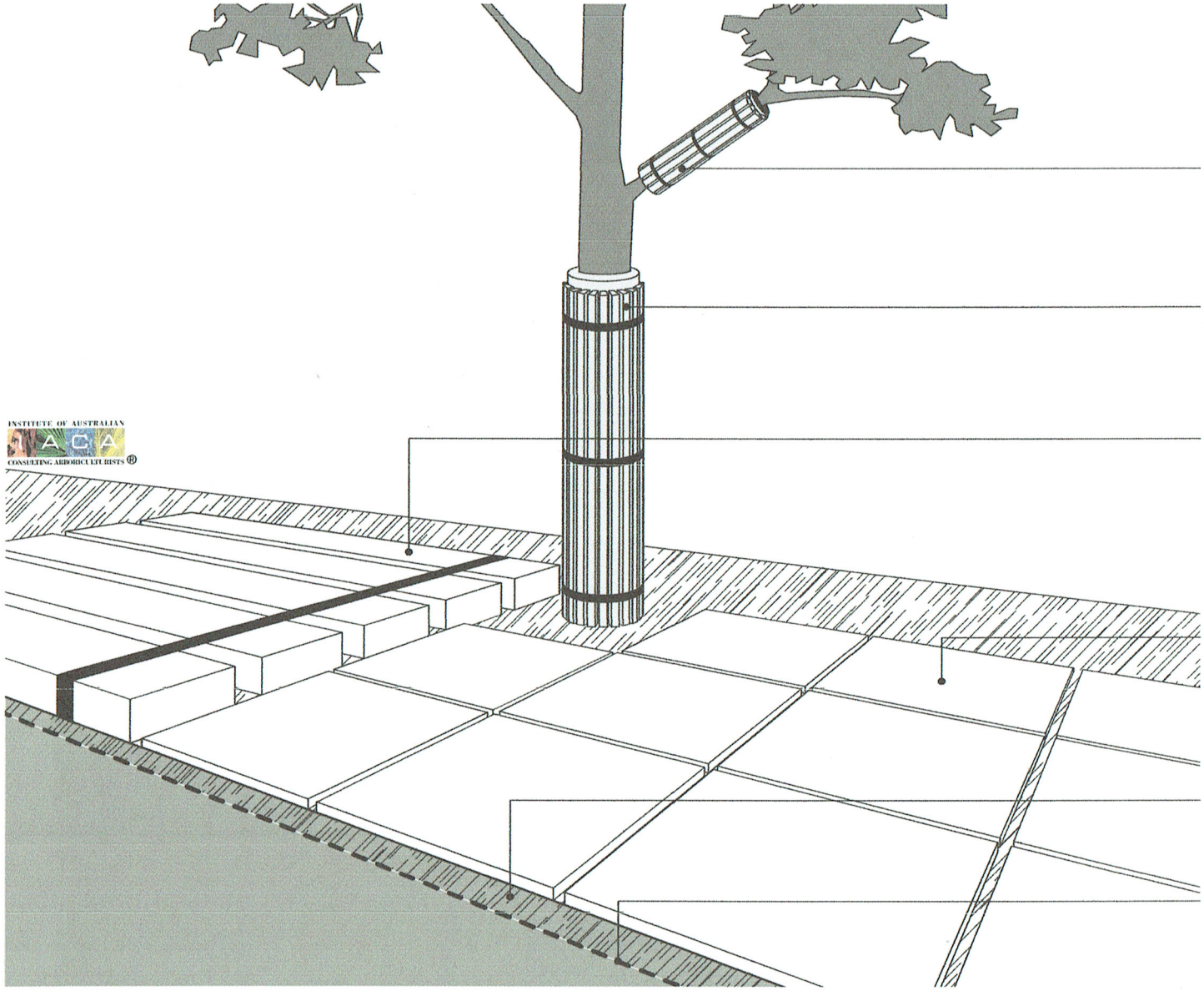
Photograph 1: Illustrating the tree as viewed from within the site.

Photograph 2: Illustrating the existing conditions in the tree's TPZ within the site.

Photograph 3: Illustrating the existing carport in the TPZ.

Photograph 4: Illustrating pruned branch at 12 metres on the NW.

APPENDIX B



Branch Protection - use boards and padding to prevent damage to bark on branch. Boards are to be strapped, not screwed or nailed to the branch.

Trunk Protection - use boards and padding to prevent damage to bark (minimum 2m). Boards are to be strapped, not screwed or nailed to the trunk.

Ground Protection - use device strapped over mulch or aggregate layer. Ground protection device should be of a suitable thickness to prevent soil compaction and root damage.

Steel plates (or approved equivalent) with or without mulch or aggregate layer below.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer.

Geotextile fabric underneath mulch or aggregate layer.

04 Examples of Branch, Trunk and Ground Protection

Not to Scale