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Attention: Robert Fenn

RE: Arborist Report – Riverbend Lane, Denmark WA

## Arborist Report – Riverbend Lane, Denmark WA

Prepared for LandCorp

Prepared by: Brett Moir

Dip. Hort (Arboriculture)  
Quantified Tree Risk Assessment –  
Licensed User No: 3417

PO Box 5227, West Busselton WA 6280  
PH: 08 9755 4361 | MOB: 0488 119 051  
E: [brett@arborguy.com.au](mailto:brett@arborguy.com.au)

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## **1.0 Introduction**

- 1.1** Instructions were received from Robert Fenn, Senior Development Manager from LandCorp to inspect a tree and provide a report on its health and structural integrity.

The tree is within a study area for a proposed new bridge over the Denmark River. LandCorp have been engaged by the Shire of Denmark to project manage the development.

There is substantial community support for the retention of this tree through the planned development and LandCorp have engaged Arbor Guy to undertake the assessment of this tree to allow for informed decision-making as to the management of this tree.

- 1.2** For this assessment I was provided with the address of the site, StreetView photos of the tree and a general brief on the nature of the development and the significance of the tree to both the general community and to the local aboriginal people.

## **2.0 Methodology**

- 2.1** A site assessment was carried out by Brett Moir, Dip. Arb on the 4<sup>th</sup> and 5<sup>th</sup> of October 2016. The assessment was carried out from ground level using the Visual Tree Assessment method to determine tree health and structure. No diagnostic devices were employed to confirm the VTA assessments nor were they determined to be required.

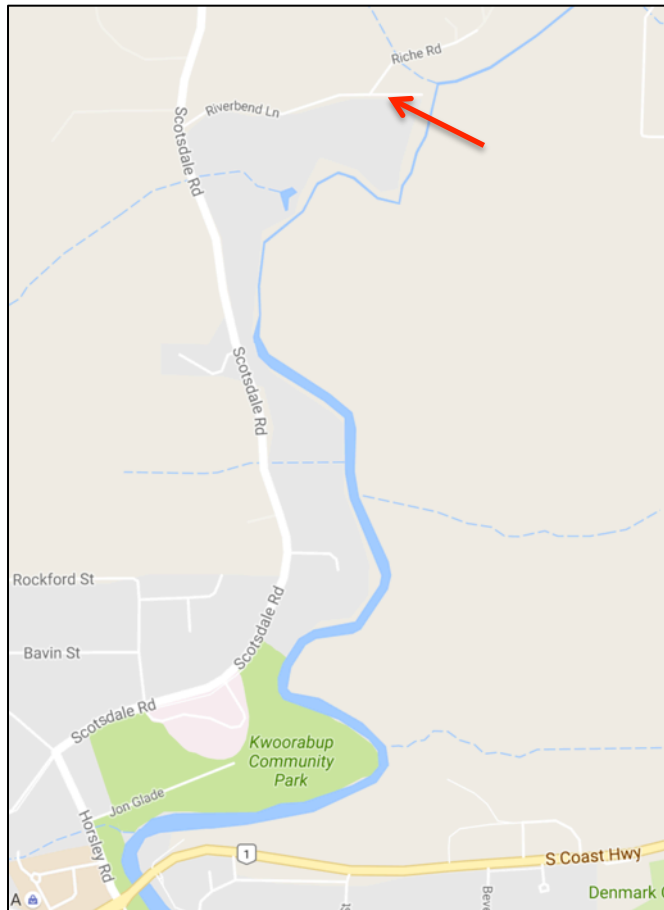
Excavation by hand was employed to determine the location and size of structural roots and to check for decay around the root collar.

- 2.2** Tree Height as noted in the report was measured using a rangefinder. Trunk diameter is measured at 1.4m above ground level.

### 3.0 The Site

- 3.1 The subject tree is located at the intersection of Riverbend Lane and Riche Road in Denmark, WA.

Riverbend Lane runs west/east from Scotsdale road to the banks of the Denmark River. The lane is bordered by urban residential properties to the south, a tourist accommodation property at the south east and by a rural residential property to the north.



**Image 1: Location of the subject tree**

- 3.2 The eastern end of the lane enters remnant native forest. This forest is predominantly Marri (*Corymbia calophylla*) and Karri (*Eucalyptus diversicolor*).
- 3.3 The subject tree is located in the 'V' between Riverbend lane and Riche Road. Located as it is between the two roads, approximately two-thirds of the root zone is compacted road base.

#### 4.0 The Tree

- 4.1 The tree is identified as a Karri (*Eucalyptus diversicolor*). It has a height of 48m and a trunk diameter of 2.0m.

The tree has a lean to the north over the bridge on Riche Rd. A mature Marri tree (*Corymbia calophylla*) arises near the base of the subject tree and leans away to the east.



**Image 1:** Looking east towards the tree.

- 4.2 It is evident from the crown structure that the tree is over-mature.

The upper canopy is undergoing a natural retrenchment and the internal and lower canopy are well developed. There are many large dead limbs in the upper crown to approximately 600mm diameter.

The limbs arising from the lower and mid trunk are epicormic shoots that have matured and become enveloped in the growth rings of the parent stem.

Considering the maturity of this tree, it is in good health and appears to have good vitality.



**Image 2:** The crown is undergoing a natural retrenchment with many large 1<sup>st</sup> order limbs having failed or died-back and a secondary internal crown structure having developed.

- 4.3** There are multiple large hollows visible in the stubs from broken limbs. A local resident reported seeing both ducks and Cockatoos nesting in these hollows.
- 4.4** Soil is mounded around the lower trunk to a height of 1m above the surrounding ground level and there are large mounds of termite mud around the base of the tree.



**Image 3:** The base of the tree with termite mud encircling the trunk.

## **5.0 Root Investigations**

- 5.1** Using a probe and a shovel I excavated around the southern and western side of the trunk in order to determine the presence and size of any structural roots. These roots are those loaded in tension by the lean of the tree.
- 5.2** On the southern side of the tree, 1m from the trunk I uncovered a large root 300mm in diameter 400mm below the road surface.
- On the western side, 1m from the trunk and 500mm deep I uncovered a root 700mm in diameter.
- 5.3** Both these roots were healthy and of a typical diameter for a tree of this size and species. Using a probe I encountered numerous obstructions that are likely to be roots but it is neither feasible nor necessary to uncover these.
- 5.4** I conclude that the root system of this tree is well developed and the tree is unlikely to root heave.



## 6.0 Termite damage

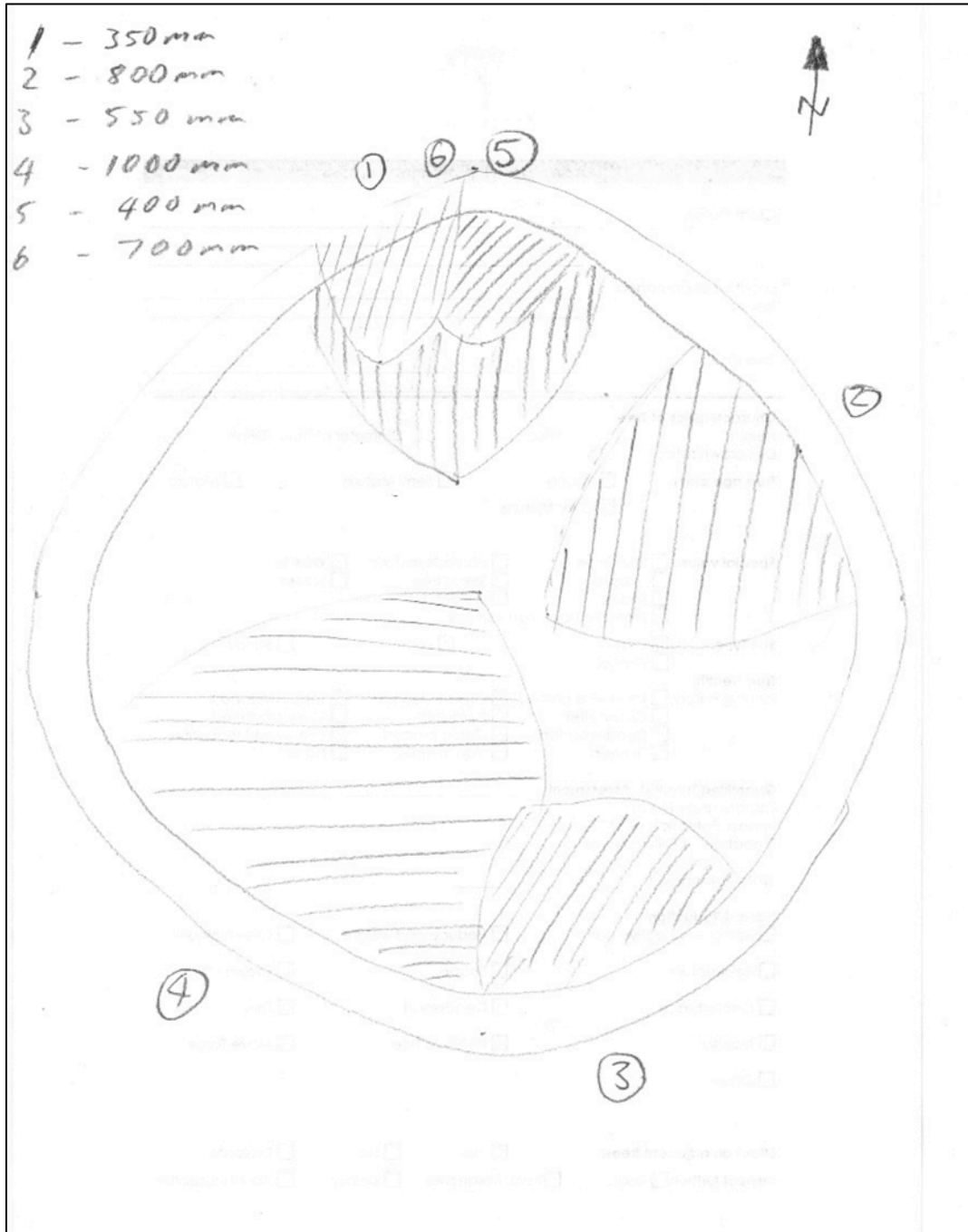
- 6.1 In order to investigate the extent of any damage from termites I used a shovel to remove the soil and termite mud from around the base of the tree. During this process I was able to confirm the termites are still active.
- 6.2 Following the removal of the mud a number of entry-points for the termites were evident on the trunk. I plotted these entry-points on a diagram and used spray-paint to highlight them so they can be located in photographs.



**Images 4 & 5: With the termite mud removed the entry-points for the termites were visible.**

**6.3** In all I uncovered 6 entry-points and using a 10mm diameter steel probe I was able to gauge the extent of the damage to the lower trunk.

The diagram below shows the location and depth (mm) that I was able to insert the probe by hand. The shaded areas represent my interpretation of the extent of the defective wood.



**Image 6:** Diagram of probe locations.





**Image 7:** Probe location no.6 – The handle of the 1100mm probe is visible protruding from the trunk.



**Image 8:** Probe location no. 4. The probe was able to be inserted 1000mm into the trunk on the tension side of the trees lean.

## **7.0 Conclusion**

**7.1** This remnant Karri is the largest tree within eyeshot of the site and contributes massively to both the environment and to the visual amenity of the area. In particular the presence of large hollows is significant given the time it takes for such hollows to form and the scarcity of them.

**7.2** Tree health is good considering the tree is senescent and undergoing a process of crown retrenchment.

**7.3** The root system appears viable and I think it is unlikely the tree will root heave.

**7.4** The termite damage and associated decay in the lower trunk is extensive. Even allowing for the healthy reaction-wood that encircles the decayed area, the area affected by termites and decay is proportionally large.

This degraded wood constitutes such a large percentage of the cross-section of the lower trunk that the tree is not structurally viable.

**7.5** If left to senesce naturally, it is my opinion that the tree will fail due to fracture of the lower trunk well before the upper crown degrades to a point where the load on the weakened trunk is sustainable.

In the event of tree failure, the tree can only fall along the lie of its lean to the north – towards the bridge on Riche Rd. Any development within the fall zone of this tree that increases vehicle and/or pedestrian traffic would create an unacceptable risk of harm.

**7.6** Based on my findings I assess this tree as remaining structurally viable for less than 20 years from the date of this assessment.

## **8.0 Management Options**

**8.1** Any development in the vicinity of this tree has the potential to degrade the trees health or further degrade tree structure. Should the preference be to retain the tree then I recommend that at a minimum, no development or disturbance – including any grade changes – be carried out within 15m of the tree. This area, known as a Tree Protection Zone is isolated from construction influences as a means avoiding further compromising the trees health and structure.

**8.2** This trees structural integrity is compromised to such an extent that any development within the fall zone of the tree or site changes that would increase vehicle and/or pedestrian traffic beneath the tree would create an unacceptable risk of harm.

If the proposed road alignment is to pass within the fall zone to the north of the tree then the removal of the tree or shortening it to a height that it could not strike infrastructure would be the only feasible option.

**8.3** If the tree is to be removed then I recommend LandCorp engage the services of a suitably qualified Arboricultural Contractor who can remove the tree in such a way that it does not injure or kill any fauna potentially living in the tree.

In addition I recommend that hollows within the tree are preserved if possible and installed as nesting boxes in trees that are to be retained.

## 9.0 Disclaimer

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