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Arboricultural Impact Assessment of Trees located on 42 Raymond Street, Eastwood

Malcolm Bruce

Contents

1. Introduction

1.1. Location of the site (See Figure 1)

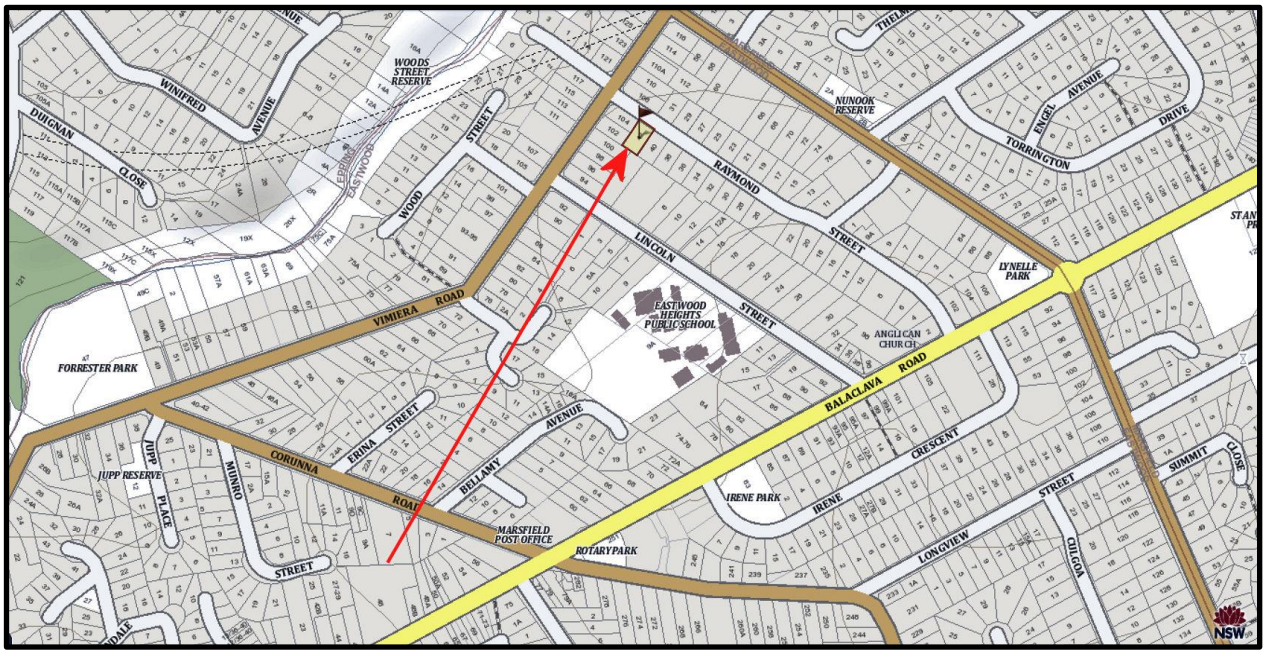

Figure 1: Location of Subject Site (From SixMaps viewed 2022)

1.2 The subject site was inspected on 19/4/2022;

1.3 This report was prepared for Clarendon Homes.

2 Aims

2.1 To examine the nominated trees and assess the trees' health, structure and environmental conditions;

2.2 To identify and describe any health, structural or environmental issues relating to the subject trees;

2.3 To calculate the required Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) for the trees;

2.4 To provide and recommend workable solutions to ameliorate and health, structural or environmental issue detected during the assessment process and to recommend suitable actions for the trees, if necessary.

3 Methods

3.1 The Crown Width was measured, by a laser distance measuring instrument, from the centre of the tree out to the edge of the crown along the four points of the compass, North, South, East and West;

3.2 The diameter of the trunk is measured at 1.4 metres above the soil by measuring the diameter using a diameter tape. This is the Diameter at Breast Height (DBH). (AS 4970-2009). Additionally, the diameter of the trunk at above the start of the root buttress is measured using a diameter tape. This Root Buttress Diameter (RBD) is for the calculation of the Structural Root Zone or Root Plate;

3.3 The height was calculated by multiplying the percentage angle, measured by a Suunto Inclinometer, by a distance from the tree, measured by a laser distance measuring instrument;

3.4 The lean of the tree was measured using a Suunto clinometer;

3.5 Tree Protection Zone (TPZ) is the principal means for protecting trees on development sites. It is an area isolated from the construction disturbance so that the tree remains viable.

The TPZ is calculated using the formula: -

TPZ = DBH (diameter at breast height) *x* 12

Where multiple trunks the DBH is calculated as:-

$DBH = \sqrt{(DBH_1)^2 + (DBH_2)^2 + + + + + + + + (DBH_x)^2}$

The TPZ is the above formula expressed in terms of a radius from the trunk of the tree. For palms the TPZ is Crown Width plus 2 metres (From AS 4970-2009);

3.6 The Structural Root Zone (SRZ) is the area required for tree stability.

Structural Root Zone (SRZ) is calculated using the formula: -

SRA Radius = $(RBD \times 50)^{0.42} \times 0.64$

The SRA expressed in terms of a radius from the trunk of the tree. (From AS 4970-2009);

3.7 Health of the trunk and branches was assessed by examination for insect and pathogen invasion, scarring, bark splitting and excess shedding, death of major branches and known structural weakness indicators, using the Visual Tree Assessment Method (VTA) to Stage 1, which includes use of a sounding (acoustic) hammer. (Mattheck & Breloer 1994, pp. 12–13, 145). No internal examination of any trees was conducted;

3.8 Crown Health was assessed by examination for excessive leaf drop, sparse crowing, small and medium branch death, yellow or discolouration of the leaves and insect and pathogen invasion of the leaves. Additionally, Crown Health was assigned a number based on comparison with illustrations in Figure 2: Crown Health Assessment. Within this comparison system the lower the number the better the health of the tree's crown. The assessed number has can be found in Table 4;

3.9 Soil compaction was arbitrarily assessed by pushing a 200mm flat bladed screwdriver into the soil;

3.10 The tree assessment has been conducted using the SULE method (Barrel 2001) (See Table 1) and Significant Retention Value (See Table 2);

3.11 Size of the impact has been calculated using the devise located in http://www.proofsafe.com.au/tpz_incursion_calculator.html

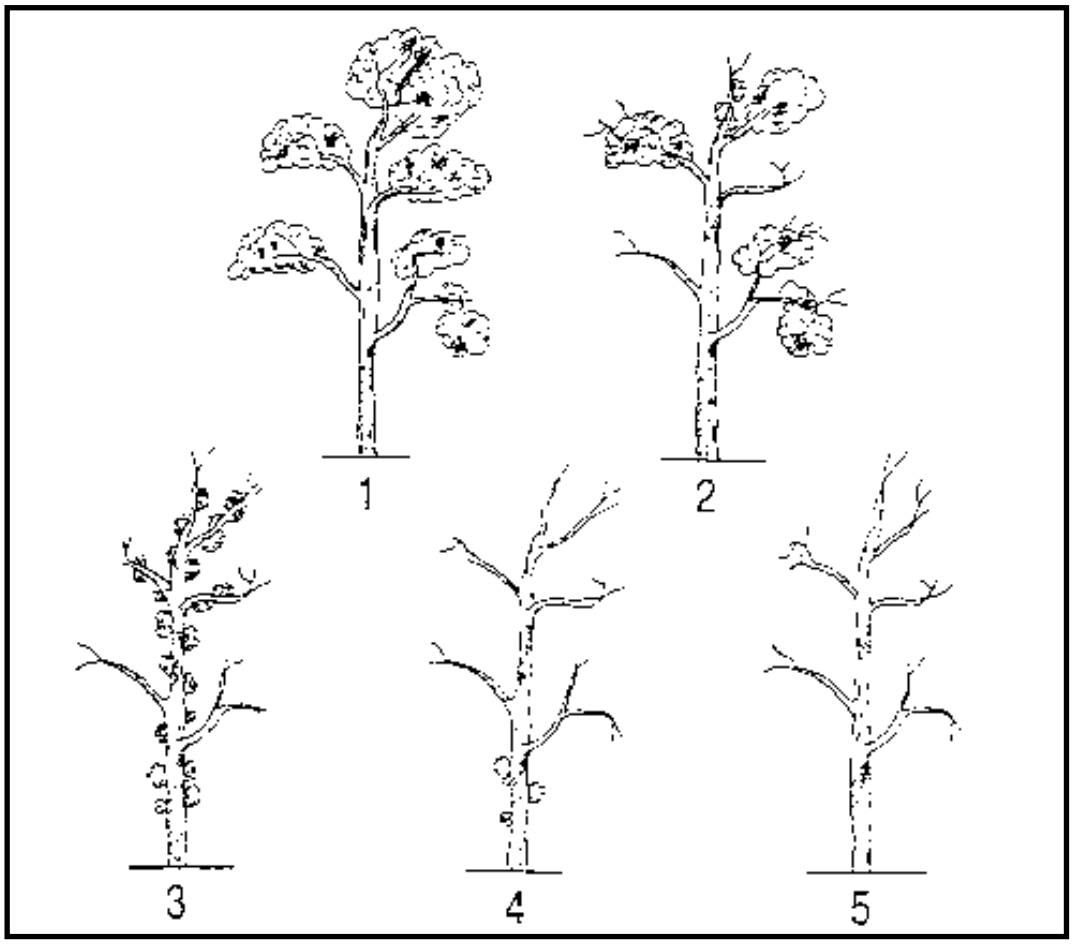

Figure 2: Crown Health Assessment

Table 1: SULE Table (After Barrel 2001)

	1	2	3	4	5
	Long:	**Medium:**	**Short:**	**Remove**	**Small, Young or Regularly Pruned**
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk	**Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk**	**Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk**	**Trees which should be removed in the next 5 years**	**Tree that can be reliably removed moved or replaced**
A	Structurally sound trees in positions that can accommodate future growth	Trees which may only live between 15 and 40 years.	Trees which may only live between 5 and 15 years.	Dead, dying, suppressed or declining trees because of disease or inhospitable conditions	Small trees less than 5m in height
B	Trees which could be made suitable for long-term retention by remedial care	Tree which may live for more than 40 years but would be removed for safety or nuisance reasons	Trees which may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees because of instability or recent loss of adjacent trees	Young trees less than 15 years old but over 5m in height
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention	Trees which may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting	Trees which may live for more than 15 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting	Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form	Formal hedges and trees intended for regular pruning to artificially control growth
D		Trees which could be made suitable for retention in the medium term by remedial care	Trees which require substantial remedial tree care and are only suitable for retention in the short term	Damaged trees that are clearly not safe to retain	Damaged trees that are clearly not safe to retain
E				Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting	Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting
F					Trees that are damaging or may cause damage to existing structures within 5 years
G					Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f)
H					Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review

Table 2: Significant Retention Value

Retention Value	Significance Description
High	A mature tree that contributes positively to a site due to its botanical, historical or local significance in combination with good physiological characteristics such as health, form, structure and future development. Significant efforts should be made to retain this tree and it should be considered for retention within a proposed development
Medium	A semi-mature to mature tree which exhibits fair or good characteristics of health, structure or form and/or may provide some amenity value to the surrounding area or habitat value. Should be considered for retention, if possible, within a development design proposal and may be modified to allow for construction (e.g.: canopy pruning, root pruning etc).
Low	A tree that provides minimal contribution to the surrounding landscape and/or may be in poor or declining health. This tree may have a poor structure, poor form, be a noxious/poisonous or listed weed species or a combination of these characteristics. It may be in an inappropriate location. This tree is not worthy of being a constraint to a development design proposal.
Nil	A tree with no landscape significance and its retention is inappropriate. The removal of this tree would be of benefit to the landscape.

4 Observations

4.1 Tree Data

Table 3: Tree Data and TPZ Calculations

No	Scientific Name	Common Name	Estimate Age(years)	Trunk Diameter (metres)	Calculated TPZ radius	Root Buttress Diameter	Calculated SRA radius	Crown Width (Metres				Height
								N	S	E	W	
1	*Jacaranda mimosafolia*	Jacaranda	40 plus years	0.45	**5.4**	0.5	**2.5**	**6.58**	**4.00**	**4.87**	**5.70**	**12.00**
2	*Prunus persica*	Peach	**Fruit Tree Exempt Species**									
3	*Eriobotrya japonica*	Loquat	**Fruit Tree Exempt Species**									

Table 4: Tree Health Assessment

No	Scientific Name	Common Name	Trunk and Branch Health	Crown Health	Crown health Assessment Code	Overall Health	SULE Rating	Observed Issues	Retention Value
1	*Jacaranda mimosafolia*	Jacaranda	Poor	Fair	1	Poor	4C	leaning tree with bark inclusion related to increment strip on trunk	Low
2	*Prunus persica*	Peach	Fruit tree, exempt species						Low
3	*Eriobotrya japonica*	Loquat	Fruit tree, exempt species						Low

4.2 Location of Tree and calculated TPZ and SRZ and Crown Limits

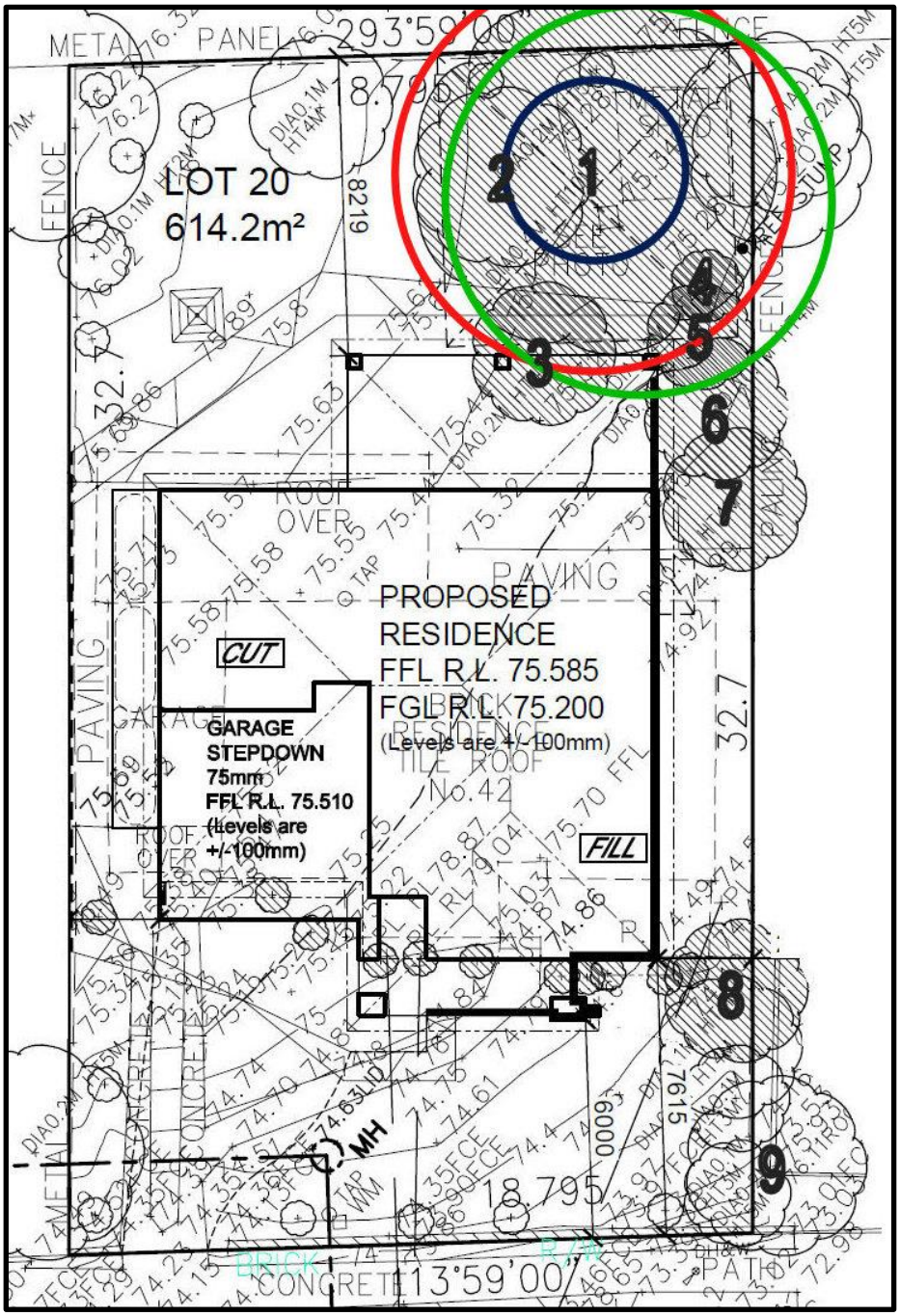

Figure 3: Position of the trees with calculated Tree Protection Zones outlined in red and the calculated Structural Root Zones outlined in blue. Scale 1:200. From Site Plan of 42 Raymond Street, Eastwood by Clarendon Homes, dated 9/2/2022

4.3 Geology and Soils

The soil surrounding the subject trees is classified as Glenorie Landscape soil (See Figure 4) with the soils derived from Wianamatta Shale. (Chapman and Murphy 1989, P.66) The original vegetation has been cleared from the area with Chapman and Murphy 1989, P.67 describing the landscape as being dominated by species that are components of either Blue Gum High Forest or Sydney Turpentine Ironbark Forest.

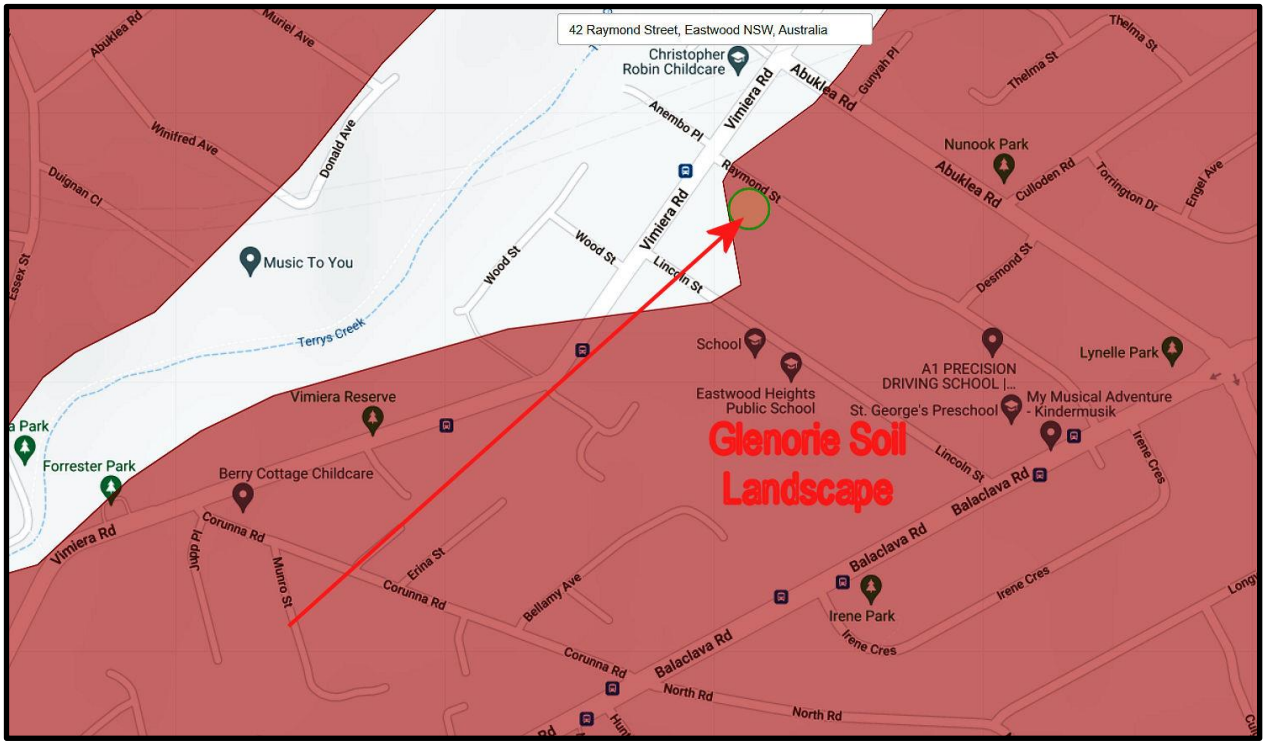

Figure 4: Subject site, showing Glenorie soil landscapes (From eSpade V2.2 2022)

5 Observations and Discussion of the Tree and Environment

5.1 Tree 1 is a mature *Jacaranda mimosafolia* (Jacaranda). (See Figure 5) Tree 1 is leaning at 14% or 8^0 with an unbalanced and asymmetrical crown. There is a long bark inclusion running up the trunk. alongside a rounded increment strip. Mattheck (2007) P.19 can develop into sheer crack or more seriously shear bombs. (See Figure 6) At the junction of the two first order branches a longitudinal crack has formed. (See Figure 7) Longitudinal cracks with included bark have been described by Mattheck as potentially dangerous (Mattheck and Breloer, 1994, P.60 and Mattheck, 2007, P.21). Lonsdale (2000) P. 20, supports Mattheck stating "*unions with included bark are most likely to fail in trees on exposed sites (especially if exposure has increased, as when surrounding trees are removed), or in dominant trees whose height makes them rather exposed. Gusts blowing between the forks are most likely to cause failure* ". Considering the tree has an asymmetrical, unbalanced crown, which Kuser (2013) P.247 states that "*Trees with unbalanced, asymmetrical crowns have weight distribution poorly over the stem. These*

trees are more prone to failure when combined with other defects, such as decay or root disease.", then the longitudinal crack's potential failure would be increased due to the unbalanced crown. Tree 1 should be removed;

Figure 5: Tree 1, showing slight lean and unbalanced, asymmetrical crown

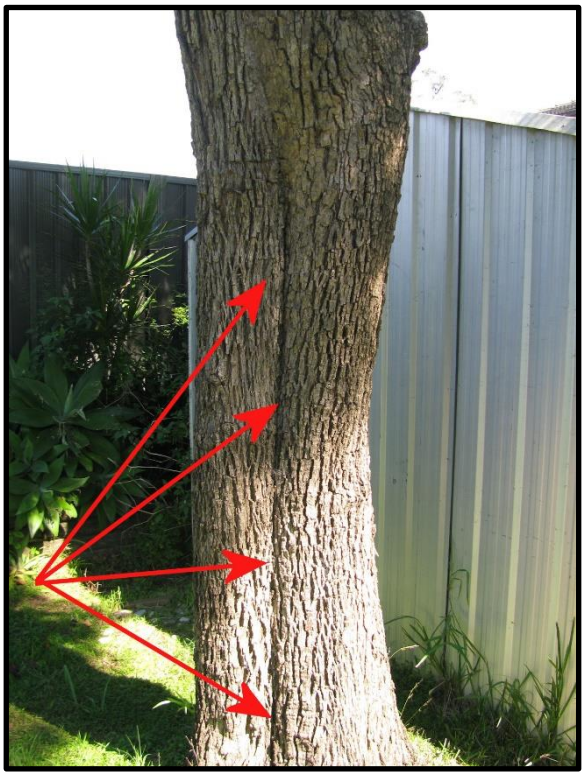

Figure 6: Bark inclusion running up the trunk of Tree 1 beside increment strip

Figure 7: Longitudinal crack in the branch union on Tree 1

5.2 Tree 2, a *Prunus persica* (Edible Peach) and Tree 3, a *Eriobotrya japonica* (Loquat) are fruit trees. (See Figure 8 and Figure 9) Under the City of Ryde Development Control Plan, 2014, Part 9.5.2.v.iii, Trees 2 and 3 can be removed without the need for consent (COR 2014);

Figure 8: Tree 2

Figure 9: Tree 3

5.3 Tree's 4 to 8 are all less than 5 metres, with a stem circumference less than 450mm. Under the City of Ryde Development Control Plan, 2014, Part 9.5.1.4.1a Tree's 4 to 8 do not come within the definition of a tree and can be removed without the need for consent (COR 2014)

5.4 Tree 9 is a *Cinnamomum camphora,* (Camphor Laurel). (See Figure 10) Tree 9 is located in the rear of 104 Vimiera Road. Although Tree 9 will be unaffected by the proposal, Tree 9 should be removed, as this species is a Weed of NSW under the *Biosecurity Act 2015* (DPI 2015), and within the *Greater Sydney Regional Strategic Weed Management Plan 2017-2022*, Appendix 2, (LLS 2019) and should be removed.

Figure 10: Tree 9

6 Recommendation

6.1 Trees 1 to 8 should be removed.

6.2 Removed tree must be replaced. The replacement trees should be locally endemic species, such as, *Elaeocarpus reticulatas* and *Syzygium smithii*, and grown as specified in AS 2303 of 2015 *Tree stock for landscape use* (Standards Australia, 2015), in 20 litre containers and between 1 and 2 metres in height.

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