

# **JACKSONS NATURE WORKS**

34 CALOOLA CRESCENT, BEVERLY HILLS 2209

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## **ARBORICULTURAL IMPACT ASSESSMENT REPORT**

**At**

**3 Berith Street Wheeler Heights**

**Prepared for**

**Ms M Zhou**

**12<sup>th</sup> June 2019**

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<h2>DISCLAIMER</h2>
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The Client acknowledges that this Report, and any opinions, advice or recommendations expressed or given in it, are the information supplied by the Client and on the data inspections, measurements and analysis carried out or obtained by Jacksons Nature Works (JNW) and referred to in the Report. The Client should rely on The Report, and on its contents, only to that extent.

Care has been taken to obtain all information from reliable sources. All data has been verified as far as possible. However, Ross Jackson – Consulting Arborist can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

- Information contained in this report covers only the trees examined and reflects the health and structure of the trees at the time of inspection. The documented, observations, results, recommendations and conclusions given may vary after the site visit due to environmental conditions.
- The inspection was limited to visual examination from the base of the subject tree without dissection, probing or coring; and
- There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject trees may not arise in the future.

Ross Jackson.

Consulting Arborist

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# 1. BACKGROUND and METHODOLOGY

- 1.1 The purpose of this Tree Report is to inform and accompany the development application (DA2018/1828) works at 3 Berith Street, Wheeler Heights – The Site.
- 1.2 The report was commissioned by Ms M Zhou to respond to Council's requirements to consider the development impacts on trees located on and around the Site.
- 1.3 This report outlines the health and condition of the subject trees, the remaining life expectancy of the trees, identifies any visible defects or other problems, describes which trees require pruning, removal, retention or represent a potential hazard and comments on the impact on these trees in relation to the works proposed. The report also provides recommended tree protection measures (Tree Management Plan) to ensure the long-term preservation of the trees to be retained where appropriate.
- 1.4 The Site is a residential site with gardens at Wheeler Heights.
- 1.5 The trees were identified by ground level Visual Tree Assessment (VTA) <sup>1</sup> only in the data collection, taken on 6.6.2019. No aerial (climbing) was undertaken.
- 1.6 All site photographs were taken by the author at the site. All photographs were taken using a digital camera (Canon 7D) with no image enhancement either within the camera or on computer.
- 1.7 The subject trees were located on plans supplied. The trees have been plotted and can be found on Annexure B – Tree Location Plan.
- 1.8 The trees were identified and their genus species and common name used. The trees were identified by the use of data collected and compared to G Burnie, S Forrester et al (1997) **Botanica** Random House, Milsons Point, NSW, Australia.
- 1.9 DBH. The Trunk Diameter at Breast Height (1.4 metres above ground level) in centimetres was measured over bark using a metal tape which automatically converts to diameter and assumes a circular trunk cross section.
- 1.10 DRB. The trunk Diameter above Root Buttress in centimetres was measured over bark using a metal tape which automatically converts to diameter and assumes a circular trunk cross section.
- 1.11 Height. Estimated overall height in metres.
- 1.12 Spread. Measured with a metal tape measure and shown in metres.
- 1.13 Useful Life Expectancy (ULE)<sup>2</sup>.  
A systematic pre-development tree assessment procedure developed by Jeremy Barrell, Hampshire, England. It gives a length of time that the Arborist feels a

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<sup>1</sup> Mattheck, Dr. Clause & Breloer, Helge (1994) – Sixth Edition (2001) **The Body Language of Trees – A Handbook for Failure Analysis** The Stationery Office, London, England

<sup>2</sup> Barrell, Jeremy (1996, 2001) **Pre-development Tree Assessment** Proceedings of the International Conference on Trees and Building Sites (Chicago) International Society of Arboriculture, Illinois, USA

particular tree can be retained with an acceptable level of risk based on the information available at the time of the inspection. SULE 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).

1.14 The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) have been calculated in terms of AS 4970 – 2009 Protection of trees on development site Section 3.

1.15 To prepare this report we have reviewed the following documents:

- Contour plan plotted by G Blue, dated 14.2.2018;
- Architectural & Footpath plans by Barry Rush & Associates Pty Ltd, dated 9.10.2018;
- Landscape plan by Greenland Design Pty Ltd, dated September 2018, Issue A;
- Northern Beaches Council, B4.22 Preservation of Trees or Bushland Vegetation (TPO); &
- Australian Standard AS 4970 – 2009 Protection of trees on development sites.

## **2. OBSERVATIONS as seen on the days of inspection (6.6.2019)**

2.1 Our tree observations can be found in Annexure A.

## **3. DISCUSSIONS**

3.1 We have been commissioned by Ms M Zhou, to examine the health and condition of the trees on and around this development site.

It is proposed to demolish the existing and the construction of a new seniors living on Site and a public footpath to Rose Avenue (development works).

3.2 We have examined the trees on site and can suggest the following considerations for the development works:

1. The following trees are classified as Exempt trees in Council's TPO and can be removed without consent: Tree 8 *Liquidambar styraciflua*, tree 9 *Cupressus sempervirens*, tree 10 *Plumaria rubra var. acutifolia* and tree 12 *Jacaranda mimosifolia*. Note these trees for removal in the Tree Management Plan (TMP);

2. Tree 1 *Liquidambar styraciflua* shows good vitality with a single trunk supporting an upright form. The following structures are within the TPZ of this tree: new pedestrian footpath from the recycling area to the driveway, front fence and pathway to the front door – refer Annexure C. It is acknowledged there are surface roots emanating from this tree, but only one growing in an easterly direction – refer plate 1. The proposed public footpath can be constructed at or just above grade, using a combination of asphalt within the TPZ radius, then reverting to traditional concrete. Plus, the pathway can meander around this tree rather than being a straight path. By using asphalt, the roots will not require removal and if they heave the pathway, it can be easily removed and replaced to an even finish. The front fence can be constructed by using piers with beams in between to minimise potential root damage. The majority of the pathways on site are outside the TPZ radius of this tree, which will not



haver an adverse impact on this tree. By employing these design considerations, the retention of this tree will be achieved. Note this tree for retention and trunk protection in the TMP.



Plate 1: root from Tree 1 with pathway beyond this root

It was also observed that one (1) branch will require pruning to allow a safe passage of the future residents and user of the new public pathway – refer plate 2. The pruning of this branch will not spoil the shape, form and weight distribution of this tree and it represents less than 10% of the live canopy. Permission to prune this tree shall be obtained from Council. All pruning shall conform with AS 4373 – 2007 *Pruning of amenity trees* Section 2.40 & 7.2.4 *Selective pruning*.



Plate 2: Tree 1 branch pruning at red arrow. Note linear root structure



3. Tree 2 *Eucalyptus haemastoma* shows good vitality with minor deadwood, located along the front southern boundary – refer plate 3. The development works have an encroachment within this trees TPZ of 15% - refer Annexure C. A 10% encroachment is considered acceptable in AS 4970 – 2009, above this level, it is considered to be a major to be a “major” encroachment. However, there is not definition as to what is acceptable above the threshold of 10% in AS 4970 – 2009. To minimise the extent of impacts the pathway and recycling can be constructed at or just above grade to limit the extent of excavations. There is an exiting boundary fence that will be retained. By employing these construction methods, the retention of this tree will be achieved. This tree should be “deadwood” to ensure the safety of the future residents in accordance with AS 4373 – 2007. Note this tree for retention and trunk protection in the TMP;



Plate 3: tree 2

4. Tree 3 *Araucaria heterophylla* is just a mature specimen with good vitality – refer plate 4. This tree is within the OSD area and has a drainage pit / pipework within its TPZ – refer Annexure C. In this situation this tree is assessed to be of low landscape retention value as it can be easily replaced in the proposed landscape works and it will need to be removed to undertake the proposed works. Removal is supported. Note for removal in the TMP;



Plate 4: tree 3

5. Tree 4 *Corymbia gummifera* shows fair to good vitality but with a very small canopy form (apparently this was originally a twin trunked tree – the second trunk has been pruned some time ago as epicormic branchlets are growing from the stump) - refer plate 5. The proposed development works are located on all sides of this tree which will lead to the demise of this tree. While this tree is assessed as fair to good vitality, its form has been spoiled by the loss of the second trunk and the removal of all branches to 6m, thus resulting in the small canopy. Therefore, it is suggested this tree be removed and replaced with a new tree in a more appropriate location to provide the on-going benefit of trees in this location. Note for removal in the TMP;



Plate 5: Tree 4

6. Tree 5 *Eucalyptus haemastoma* shows poor vitality with only one stem showing live foliage and with possible attack by the Armillaria fungus and a suspect lightning strike – refer plate 6 & 7. This tree has an ULE Rating 4a “Dead, dying, suppressed or declining tree because of disease or inhospitable conditions”, which supports its removal despite being within the building footprint. Removal is highly recommended. Note for removal in the TMP;



Plate 6 – mushrooms at base of tree 5





Plate 7: tree 5 showing 1 live branch & loss of bark from lightning strike

7. Tree N1 has been removed by the neighbour.

8. Tree N2 *Syzygium smithii* shows good vitality with crown lifting to 5m. The development works have less than 10% encroachment within this neighbour's tree (9.4%), which is assessed as being acceptable in AS 4970 – 2009. Note for retention in the TMP;

9. The following trees are within the proposed building footprint: Tree 6 *Callistemon viminalis*, tree 7 *Melaleuca quinquenervia*, tree 13 *Liquidambar formosa*, tree 14 *Callistemon viminalis*, tree 15/16 *Hibiscus tiliaceus*, tree 17 *Duranta repens* 'Geisha Girl' and tree 18 *Eucalyptus haemastoma*. All of these trees have attributes that support their removal:

a. Tree 6 has fair vitality with extensive suppression by English Ivy that has reduced this trees vitality – refer plate 8. Plus, it has twin trunks that have created a rounded bun form, as opposed to its natural single trunk – refer plate 9;



Plate 8: tree 6

b. Tree 7 has twin trunks with bifurcation between their stems and then the northern stem has bifurcation at 1.5m & 5m – refer plate 9. This is a structural defect that can fail at any time, especially with the removal of the surrounding trees that have reduced the winds.



Plate 9: tree 7 with multiple bifurcations & tree 6 in background

c. Tree 13 is related to the exempt tree Liquidambar and should be considered as an undesirable species. However, this tree has had a complete failure with the stems being epicormic regrowth which has a weak attachment to the decaying stump – refer plate 10. Remove this tree to make safe this site.



Plate 10 – tree 13

d. Tree 14 has poor form and is covered with a vine that has contributed to its low landscape rating – refer plate 11.  
e. Tree 15/16 has also suffered a partial trunk failure and isn't recoverable – refer plate 11 & 12.





Plate 11; tree 14 & 15/16 in background

f. Tree 17 shows good vitality and is considered a large shrub – refer plate 12. Although in good vitality it isn't considered to be a restriction on the proposed development due to its small size and exotic heritage (American tropics).



Plate 12: tree 17 & tree 15/16 in foreground

g. Tree 18 has been suppressed in form with all canopy on a long low stem, plus it has a large open injury from 1m to ground level with decay into the heartwood – refer plate 13. No amount of sound horticultural care could restore this tree's structural integrity and long-term viability. Removal is warranted despite any development impacts.



Plate 13: tree 18

For the identified facts above, all these trees are recommended for removal in this development application. Note for removal in the TMP;



10. Tree 11 *Eucalyptus botryoides* shows average form (suppression and small canopy) with a significant lean to the east. Despite have an acceptable encroachment within its TPZ, removal is supported with the proposed replanting of more appropriate trees that will outperform this tree. Note for removal in the TMP;

11. The following are street trees in Berith Street: Tree 20 *Eucalyptus racemosa*, tree 21 & 22 *Angophora costata*. Tree 23 *Eucalyptus racemosa* is in the front yard of the corner residence in Berith Street. Our examination of the street trees and the neighbour's tree has concluded the majority of the roots from Trees 20, 21 & 22 are on the street side of the root plate and the roots of tree 23 are not evident – refer plate 14 & 15. The same construction methodology can be used within these trees as for tree 1, i.e. use asphalt within their TPZ radii then reverting to concrete outside these dimensions – plus some meandering can be used near tree 20. It appears there is an informal track (footpath) along this street – refer plate 14. By employing these design considerations, the retention of these trees will be achieved. N.B no canopy pruning is required. Note these trees for retention and trunk protection in the TMP. Footpath location to be confirmed by Council's Engineering department.



Plate 14: tree 20 with informal footpath on the east



Plate 15: tree 21, 22 & 23

## 4. RECOMMENDATIONS

In consideration of the data collected recommendations are provided for the removal or retention of trees including specific tree protection measures required to reduce the anticipated impacts from the proposed construction on those trees proposed to be retained.

The report specifically recommends:

- a. Retain the following street trees: Tree 1, 20, 21 & 22;
- b. That the footpath along Berith Street be constructed on the east side of these trees using asphalt within the TPZ radii of these trees (Tree 1: 4.2m, tree 20: 6.8m, tree 21: 4.3m & tree 22: 2.9m), then reverting to concrete. The path shall meander around these trees to avoid being against their trunks and to avoid potential root damage by being at or just above grade. Details to be provided by Council's Engineers;
- c. Retain the following trees on site: Tree 2;
- d. Remove the following trees on site: Tree 3, 4, 5, 6, 7, 11, 13, 14, 15/16, 17 & 18;
- e. Remove the following Exempt trees on site: Tree 8, 9, 10 & 12,
- f. Retain the following neighbour's trees: Tree N2 & 23;
- g. Tree removal work shall be carried out by an experienced tree surgeon in accordance with *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal (2016)*;
- h. Install the following Tree Protection Measures around the retained trees: Tree protection measures shall be a temporary fence of chain wire panels 1.8 metres in height (or equivalent), supported by steel stakes or concrete blocks as required and fastened together and supported to prevent sideways movement. Existing boundary fences or walls are to be retained shall constitute part of the tree protection fence where appropriate. A sign is to be erected on the tree protection fences of the trees to be retained that the trees are covered by Council's tree preservation orders and that "No Access" is permitted into the tree protection zone;
- i. Trunk protection shall consist of a padding material such as hessian or thick carpet underlay wrapped around the trunk. Timber planks (50mm x 100mm or similar) shall be placed over the padding and around the trunk of the tree at 150mm centres. The planks shall be secured with 8-gauge wire or hoop steel at 300mm spacing. Trunk protection shall extend a minimum height of 2 metres or to the maximum possible length permitted by the first branches – Annexure D, on the following trees: Tree 1, 2, 20, 21 & 22;
- j. That a Tree Management Plan be prepared as part of the Construction Certificate by a consulting arborist who holds the Diploma in Horticulture (Arboriculture), Level 5 under the Australian Qualification Framework including a Tree Transplanting Method Specification;
- k. An AQF Level 5 Project Arborist shall be engaged to supervise the building works and certify compliance with all Tree Protection Measures;
- l. The tree locations can be found in Annexure B;

m. Tree impact plan can be found in Annexure C.

A handwritten signature in black ink, appearing to read 'Ross Jackson', with a large, stylized initial 'R'.

Ross Jackson M.A.A. & M.A.I.H.  
Consulting Arborist 1695  
Graduate Certificate in Arboriculture AQF Level 8  
Diploma Horticulture (Arboriculture) – AQF Level 5  
Certificate III in Horticulture  
Certificate in Horticulture (Landscape – Honours



### Annexure A: Observations as seen on the day of inspection of trees

Tree No	Botanical Name	Age Class	Height (m)	Spread (m)	D.B.H. (cm)	D.R.B. (cm)	TPZ (radius m)	SRZ (radius m)	Condition comments as seen on site	ULE
1	<i>Liquidambar styraciflua</i>	M	9	10	35	45	4.2	2.4	G vitality, ST, surface roots	2a
2	<i>Eucalyptus haemastoma</i>	M	9	12	52	110	6.2	3.4	G vitality, possibly cracking retaining wall	2a
3	<i>Araucaria heterophylla</i>	M	7	6	20	24	2.4	1.8	G vitality	2a
4	<i>Corymbia gummifera</i>	M	10	6	34	47	4.1	2.4	G vitality	2a
5	<i>Eucalyptus haemastoma</i>	M	12	11	43, 55	100	8.4	3.3	P vitality, suspected lightning strike to right side of tree 1/2 dead, left side top dead, Armillaria spp suspected at base	4a
N1	Not found									
N2	<i>Syzygium smithii</i>	M	8	4	42	50	5.0	2.5	G vitality. ND	2a
6	<i>Callistemon viminalis</i>	M	7	7	30 x 2	80	5.1	3.0	F vitality, covered in vine	2b
7	<i>Melaleuca quinquenervia</i>	M	10	12	43, 50	90	7.9	3.2	G vitality, bifurcated, included bark @ 1m	2b
8	<i>Liquidambar styraciflua</i>	M	18	11	50	63	6.0	2.7	Exempt species	-
9	<i>Cupressus sempervirens</i>	M	12	8	50	60	6.0	2.7	Exempt species	-
10	<i>Plumeria rubra</i> var. <i>acutifolia</i>	M	<5	-	-	-	-	-	Exempt species	-
11	<i>Eucalyptus botryoides</i>	M	7	8	40	46	4.8	2.4	F - A vitality, large amount of ER, thin canopy	3b
12	<i>Jacaranda mimosifolia</i>	M	8	-	-	-	-	-	Exempt species	-
13	<i>Liquidambar formosa</i>	M	8	7	16x2	23	2.7	1.8	P vitality, complete tree failure has occurred	4a
14	<i>Callistemon viminalis</i>	M	6	6	4 x 10	35	2.4	2.1	P vitality	3b
15/16	<i>Hibiscus tiliaceus</i>	M	6	2	10, 8	26	2.0	1.9	P vitality, partial tree failure, decay in trunk	3b
17	<i>Duranta repens</i> 'Geisha Girl'	M	6	6	3 x 10	30	2.1	2.0	G vitality	2b
18	<i>Eucalyptus haemastoma</i>	M	6	8	30	43	3.6	2.3	G vitality, major trunk injury @ 1m to GL, decay in trunk, trunk lean	2b
20	<i>Eucalyptus racemosa</i>	M	10	10	2 x 40	64	6.8	2.7	G vitality, ST	2a
21	<i>Angophora costata</i>	M	9	8	36	42	4.3	2.3	G vitality, ST	2a

Tree No	Botanical Name	Age Class	Height (m)	Spread (m)	D.B.H. (cm)	D.R.B. (cm)	TPZ (radius m)	SRZ (radius m)	Condition comments as seen on site	ULE
22	<i>Angophora costata</i>	M	7	7	24	35	2.9	2.1	G vitality, ST	2a
23	<i>Eucalyptus racemosa</i>	OM	8	3	32	40	3.8	2.3	P vitality, Extensive pruning leaving 1 main stem. Lower trunk injury	4e

### Terms used in Tree Survey & Report:

#### Age Class

**(Y) – Young** refers to a well-established but juvenile tree. Less than 1/3 life expectancy

**(SM) – Semi-mature** refers to a tree at growth stages between immaturity and full size. A tree has reached First Adult Form i.e. displays adult characteristics. 1/3 to 2/3 life expectancy

**(M)- Mature** refers to a full size tree with some capacity for future growth. Older than 2/3 life expectancy

**(OM) – Over-mature** refers to a tree approaching decline or already declining. Older than 2/3 life expectancy and showing signs of irreversible decline.

**Health** refers to a tree's vigour, growth rate, disease and/or insects.

**Vitality** summarises observations about the health and structure of the tree on a scale of: **(G) Good, (F) Fair, (P) Poor & (D) Dead.**

**Good:** Tree is generally healthy and free from obvious signs of structural weaknesses or significant effects of pests and diseases or infection;

**Fair:** Tree is generally vigorous although has some indication of being adversely affected by the early effects of disease or infection or environmental or mechanical damage. Appropriate tree maintenance can usually improve overall health and halt decline;

**Poor:** Tree in decline and is not likely to improve with reasonable maintenance practices or has a structural fault such as bark inclusion;

**Dead:** Tree no longer capable of sustained growth.

**Deadwood (DW)** – deadwood found in canopy as a percentage.

**Over Head Power Lines (OHPL)** – upper canopy pruned to accommodate power lines at a given height.

**Height** expressed in metres refers to estimated overall height of tree.

**Next Door tree (ND)** – tree located in the neighbour's property.

**Street Tree (ST)** – tree located in Councils footpath reserve.

**Spread** expressed in metres refers to estimated spread of crown at the drip line.

**(DBH) Diameter at Breast Height** expressed in millimetres refers to the trunk diameter at 1.4 metres above ground level. Where there are multiple trunks the combined diameter has been calculated in terms of Appendix A – AS 4970 – 2009, shown in brackets.

**(DRB) Diameter above Root Buttress** expressed in millimetres refers to the trunk diameter above root buttress.

**(TPZ) Tree Protection Zone & Structural Root Zone (SRZ)** as defined by AS 4970 – 2009 Section 3

**(ULE)** The various ULE categories indicate the useful life anticipated for an individual tree or trees assessed as a group. Factors such as the location, age, condition and vitality of the tree are significant to the determination of this rating. Other influences such as the tree's effect on better specimens and the economics of managing the tree successfully in its location are also relevant to ULE (Barrell 1993, 1995, 2001).

**ULE RATING (UPDATED 1/4/01) BARRELL**

<b>1.Long ULE:</b> Trees that appear to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	<b>2.Medium ULE:</b> Trees that appear to be retainable at the time of assessment for more than 15-40 years with an acceptable level of risk.	<b>3.Short ULE:</b> Trees that appear to be retainable at the time of assessment for more than 5-15 years with an acceptable level of risk.	<b>4.Remove:</b> Trees that should be removed within the next 5 years.	<b>5.Small, young or regularly pruned:</b> Trees that can be reliably moved or replaced.
(A) Structurally sound trees located in positions that can accommodate future growth	(A) Trees that may only live between 15 and 40 more years.	(A) Trees that may only live between 5 and 15 more years.	(A) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.	(A) Small trees less than 5 Metres in height.
(B) Trees that could be made suitable for retention in the long term by remedial tree care.	(B) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.	(B) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.	(B) Dangerous trees because of instability or recent loss of adjacent trees.	(B) Young trees less than 15 years old but over 5 metres in height.
(C) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	(C) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	(C) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.	(C) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.	(C) Formal hedges and trees intended for regular pruning to artificially control growth.
	(D) Trees that could be made suitable for retention in the medium term by remedial tree care.	(D) Trees that require substantial remedial tree care and are only suitable for retention in the short term.	(D) 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.	
			(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.	



BEARINGS SHOWN HAVE BEEN DETERMINED FROM LAND & PROPERTY INFORMATION PLANS AND ARE RELATED TO MAGNETIC NORTH. TRUE NORTH IS APPROXIMATE ONLY AND FURTHER INVESTIGATION WOULD BE REQUIRED TO DETERMINE ACCURATE TRUE NORTH.





1. COUNTIES SHOWN HAVE BEEN INTERPOLATED FROM SPOT LOCATIONS TAKEN ON-SITE AND ARE A REPRESENTATION OF THE "TYPICAL" ONLY.
2. DIVERSIFIED SOILS (SANDHILLS & EXPANSIVES) HAVE BEEN DETERMINED BY LAND AND MOISTURE INFORMATION PLANS ONLY. BOUNDARIES HAVE NOT BEEN ACCURATELY DETERMINED.
3. COUNTIES SHOWN HAVE BEEN LOCATED WHERE POSSIBLE BY FIELD SURVEY. LOCATIONS OF COUNTIES NOT SHOWN WERE DETERMINED BY POSTAL CODES.
4. COUNTRIES OF ANY TREES SHOWN ON THE PLANS ARE APPROXIMATE.

MS ZHOU

CURTIS REFERENCE: SU10074

ROSE AVENUE  
N.C. 28355  
ORIGINAL JOB

LOT A DP 411784  
3 BERTH STREET  
WHEELER HEIGHTS, NSW

CONTOUR PLAN

100

1.297/300464

07/07/2017

100

DATE	TIME	TYPE	WIND	QUANTITY
7/1	0.30	50		71
7/2	0.40	70		72
7/3	0.50	60		73
7/4	0.50	1500		74
7/5	0.50	1500		75
7/6	0.50	70		76
7/7	1.00	1200		77
7/8	0.40	50		78
7/9	0.40	50		79
7/10	0.40	50		80
7/11	0.40	1000		81
7/12	0.50	1000		82
7/13	0.50	400		83
7/14	0.50	50		84
7/15	0.50	50		85
7/16	0.50	50		86
7/17	0.50	50		87
7/18	0.50	50		88
7/19	0.50	50		89
7/20	0.50	60		90
7/21	0.50	60		91
7/22	0.50	60		92
7/23	0.50	70		93

	BENCH MARK
	PHOTO POINT
	GULLY PIT
	VERTICAL CROSS-SECTION OF BANK
	BOTTOM OF BANK

23. ELECT. CO. BOST.  
 24. ELECTRIC. METER  
 25. GVA. METER  
 26. INDIANAT.  
 27. INDIAN. STATE  
 28. INDIAN. STATE  
 29. INDIAN. STATE  
 30. INDIAN. STATE  
 31. INDIAN. STATE  
 32. INDIAN. STATE  
 33. INDIAN. STATE  
 34. INDIAN. STATE  
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### LEGEND





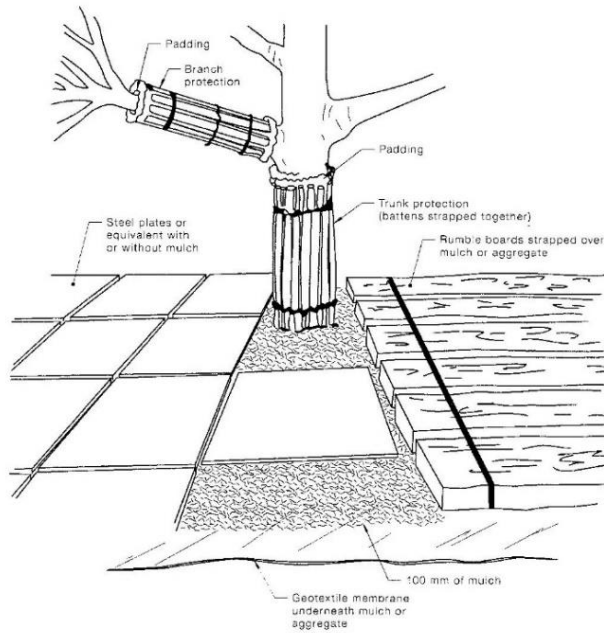




## 22



## Annexure E: Trunk protection & sample



### NOTES:

- 1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.
- 2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

FIGURE 4 EXAMPLES OF TRUNK, BRANCH AND GROUND PROTECTION

