

Statement of Environmental Effects,
Proposed Wollongong Hospital
Carpark

APPENDIX

D

ARBORIST REPORT (MOORE TREES)

Moore Trees
Arboricultural Services

ABN 26009753751

Arboricultural Development Assessment Report

3-11 Dudley Street
Wollongong NSW 2515
Lot 3-11 DP 1043216

31.5.2013
FINAL



Member 2013



Registered
Consultant

Prepared for: TSA Management Pty Ltd
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Sydney NSW 2000

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Summary

This report has been compiled for TSA Management Pty Ltd. The report concerns a proposed Development Application for 3-11 Dudley Street, Wollongong NSW 2500. This arborist report refers to six (6) trees.

This report contains the following information required in Wollongong City Council Development guidelines:-

- 1) All trees were assessed for Safe Useful Life Expectancy (SULE).
- 2) Genus and species of each tree identified.
- 3) Impact of the proposed development on each tree.
- 4) Impact of retaining tree on the proposed development.
- 5) The Tree Protection Zone (TPZ) for each tree to be retained.
- 6) Any root barriers necessary, type and location.
- 7) Any branch or root pruning that may be required for trees.
- 8) List trees within fifteen (15) metres of the site boundary.

However, items 5, 6 and 7 are not required for this site.

Trees 1- 6 are not significant trees to the site and are proposed to be removed for the purpose of the development.

It would appear the only area available for compensatory planting are the road verges which are ultimately Council property. The Dudley Street frontage has existing power lines and as such a small shrub species rather than a tree species is recommended.

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1 INTRODUCTION

- 1.1** This report has been conducted to assess the health and condition of six (6) trees located at 3-11 Dudley Street Wollongong NSW 2515. This report has been prepared for TSA Management Pty Ltd of Level 16, 207 Kent Street, Sydney NSW 2000 as required for a Development Application with Wollongong City Council at this site.

This report has been requested post the design of the proposed car park unit and as such has not considered retention of any tree however the site trees were found to be reasonably small or not highly significant to the site.

The subject trees were assessed for their health and condition. As specified in the Wollongong City Council Development Application guidelines the following data was collected for each tree:

- 1) A site plan locating all trees over three (3) metres in height, including all street trees.
- 2) All trees were assessed for Safe Useful Life Expectancy (SULE), health and amenity value.
- 3) Genus and species of each tree.
- 4) Impact of the proposed development on each tree.
- 5) The Tree Protection Zone (TPZ) for each tree to be retained.
- 6) Any branch or root pruning that may be required for trees.

However, some of this information is not relevant for this site. Also noted for the purpose of this report were:

- Health and Vigour; using foliage colour and size, extension growth, presence of deadwood, dieback and epicormic growth throughout the tree.
- Structural condition using visible evidence of bulges, cracks, leans and previous pruning.
- The suitability of the tree taking into consideration the proposed development.
- Age rating; Over-mature (>80% life expectancy), Mature (20-80% life expectancy), Young, Sapling (<20% life expectancy).

1.2 Documents and information provided: For this Arborist report I was given a site plan of the location and drawings of the proposed development, undertaken by Cardno for Project No. NA80813070. (Also see 2.7).

1.3 Location: The proposed development site is located at 3-11 Dudley Street Wollongong NSW 2515, known as Lots 3-11 DP 1043216. The proposed development site from hereinafter will be referred to as "the Site".

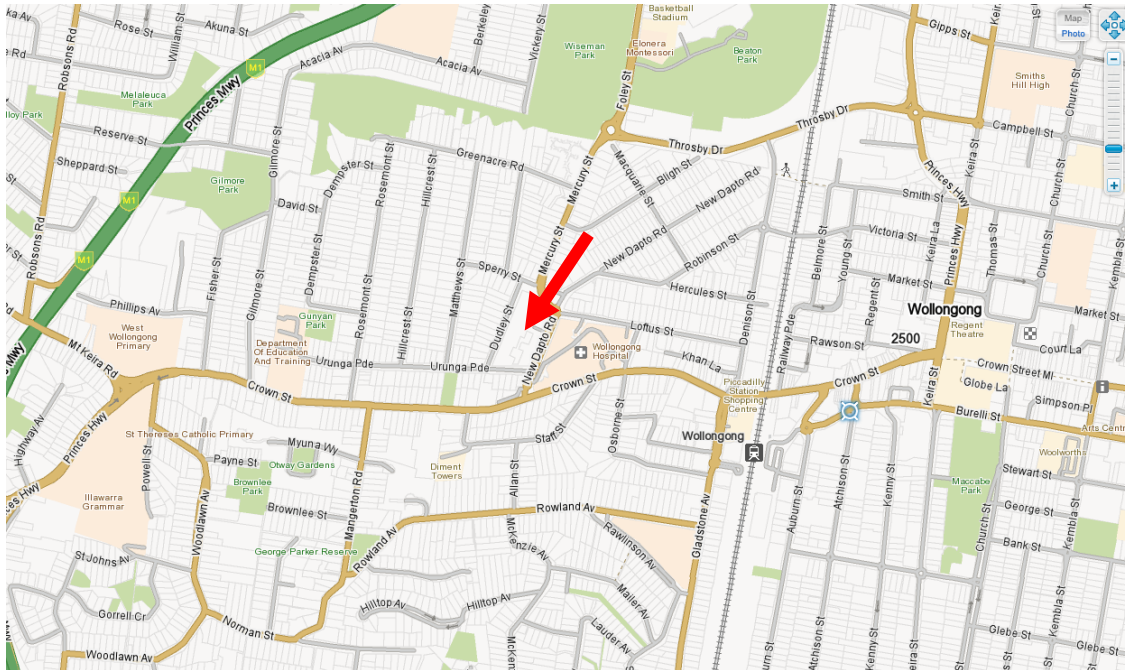


Diagram 1: Location of subject site, 3-11 Dudley Street (Red arrow, whereis.com.au, 2013)



Diagram 2: Location of the study area (Google earth, 2013).

2 METHODOLOGY

- 2.1 To record the health and condition of the trees, a Visual Tree Assessment (VTA) was undertaken on the subject trees on 27th May 2013. This method of tree evaluation is adapted from Matheny and Clark, 1994 and is recognised by The International Society of Arboriculture. Individual tree assessments are listed in Appendix 2 of this report. All inspections were undertaken from the ground. No diagnostic devices were used on these trees.
- 2.2 This report is only concerned with trees on the site that come under the Wollongong Council Tree Management Control Plan, 2009 (TMCP). It takes no account of any tree or shrub under three (3) metres in height.
- 2.3 **Height:** The heights and distances within this report have been measured with a Bosch DLE 50 laser measure.
- 2.4 **Tree Protection Zones (TPZ):** The Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. The TPZ is a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable. TPZ's have been calculated for each tree should they be required to be retained for any instance. The TPZ calculation is based on the Australian Standard *Protection of trees on development sites*, AS 4970, 2009.
- 2.5 **Structural Root Zone (SRZ):** The SRZ is a specified distance measured from the trunk that is set aside for the protection of tree roots, both structural and fibrous. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The TPZ and SRZ are measured as a radial measurement from the trunk. No roots should be severed within this area. A detailed methodology on the TPZ and SRZ calculations can be found in Appendix 4.
- 2.6 **SULE:** The subject trees were assessed for a Safe Useful Life Expectancy (SULE). The SULE rating for each tree can be seen the Tree Assessment Schedule (Appendix 2). A detailed explanation of SULE can be found in Appendix 3.

2.7 Plans provided: marked as follows:

DA-0000 COVER SHEET
DA-1000 SITE PLAN
DA-1001 MULTI-STOREY CARPARK GA PLAN - LEVEL 1
DA-1002 MULTI-STOREY CARPARK GA PLAN - LEVEL 2
DA-1003 MULTI-STOREY CARPARK GA PLAN - LEVEL 3
DA-1004 MULTI-STOREY CARPARK GA PLAN - LEVEL 4
DA-1005 MULTI-STOREY CARPARK GA PLAN - LEVEL 5
DA-1006 MULTI-STOREY CARPARK GA PLAN - LEVEL 6
DA-1007 EXISTING LEVEL 5a CARPARK MODIFICATIONS
DA-1010 MULTI-STOREY CARPARK ELEVATIONS - SHEET 1
DA-1011 MULTI-STOREY CARPARK ELEVATIONS - SHEET 2
DA-1015 MULTI-STOREY CARPARK SECTIONS - SHEET 1
DA-1016 MULTI-STOREY CARPARK SECTIONS - SHEET 2
DA-1030 LEVEL 1 TRAFFIC CIRCULATION PLAN
DA-1031 LEVEL 2 TRAFFIC CIRCULATION PLANS
DA-1032 LEVEL 3 TRAFFIC CIRCULATION PLANS
DA-1033 LEVEL 4 TRAFFIC CIRCULATION PLANS
DA-1034 LEVEL 5 TRAFFIC CIRCULATION PLANS
DA-1035 LEVEL 6 TRAFFIC CIRCULATION PLANS
DA-1040 SITE GENERAL ARRANGEMENT PLAN
DA-1050 TEMPORARY ON-GRADE CARPARK PLAN

2.8 Impact Assessment: An impact assessment was conducted on the site trees. This was conducted by assessing the site survey and plans provided by TSA Management Pty Ltd. The plans provided were assessed for the following:

- Reduced Level (R.L.) at base of tree.
- Incursions into the Tree Protection Zone (TPZ).
- Assessment of the likely impact of the works.

3 RELEVANT BACKGROUND INFORMATION

- 3.1 The site is a west facing slope containing an old single story residential dwelling along the New Dapto Street frontage and newer infrastructure buildings along Dudley Road. As such the trees on site are a mixture of native and exotic tree species in varying condition of health. The proposed works entail demolition of all building and construction of a multistorey car park.
- 3.2 **Environmental Significance:** A Tree Management Control Plan (TMCP) applies to the whole of the Wollongong Local Government Area and is part of the Wollongong City Council Development Control Plan, 2009. This TMCP protects all trees above three (3) metres in height with a girth of twenty (20) centimetres or more, measured at a distance of one hundred (100) centimetres above the ground. As Council is the consent authority regarding the site trees, Council may not agree with the views expressed in this report and condition that certain trees are to be retained. This may entail redesign or minor alterations of the project. In this instance, the Architect or Draftsperson should refer to the TPZ and SRZ measurements to enable adequate distances to be maintained between the tree and any proposed works.
- 3.3 **Illegal tree removal:** Damaging or removing trees can result in heavy fines. Local Government does have the authority to issue on the spot fines known as penalty infringement notices (PINS) starting from \$1,500 or can elect to have a potential tree damaging incident addressed in the Local Court. Recent cases, for example, include two (2) mature trees removed for development (Sutherland Shire Council (SSC) v Palamara, 2008) costing \$4,500 in fines and \$5,000 in court costs. SSC v El-Hage, 2010 concerning illegal tree removal of a single tree costing \$31,500 in fines and \$5,000 in costs. Poisoning trees can also incur substantial fines (SSC v Hill) resulted in a single tree fine that totalled \$14,000 plus a \$10,000 bond for a replacement tree. All of the above cases resulted in a criminal conviction for the guilty parties.

- 3.4 The Site Trees:** The site was inspected on 27th May 2013. Each tree has been given a unique number for this site and can be viewed on the Tree Protection Plan (Appendix 1). This plan is based on the plan provided by TSA Management Pty Ltd.
- 3.5 Tree 1** is a mature exotic Frangipani (*Plumaria acutifolia*) located on the New Dapto Street frontage (Plate 1). The tree has a decurrent asymmetrical canopy that is in good health and appears structurally sound.
- 3.6 Trees 2 and 3** are both mature native Willow gum (*Eucalyptus scoparia*) located within the existing car park area (Plate 2). Both trees have decurrent symmetrical canopies that are dominant in the surrounding area. Both canopies have storm damage likely due to wind tunnelling that occurs around the existing car park complex. Dead wood is also present throughout the canopy.
- 3.7 Tree 4** is a young exotic Date palm (*Phoenix canariensis*) growing against the existing car park building (Plate 3). The tree has an excurrent symmetrical canopy in excellent health and condition. Many Local Government Areas (LGA) consider this species a weed species.
- 3.8 Tree 5** is a hedge planting of Mock Orange (*Murraya paniculata*) that forms a partial, if not, token screen (Plate 3). The trees are in good health and appear structurally sound.
- 3.9 Tree 6** is a mature native Tallowwood (*Eucalyptus microcorys*) located on the Dudley Street frontage. The tree has a decurrent symmetrical canopy however it has undergone extensive pruning on the western side to allow for power line clearance (Plate 4). It was also noted, several metres away, a large mature Brushbox that has been lopped at 2.5 metres for wire clearance. Tree 6 is in good health and appears structurally sound. However the continued line clearance will certainly be an ongoing issue.

- 3.10 Exempt trees:** Wollongong City Council lists several species of trees as being exempt from the provisions of the TMCP under Section 3 of the TMCP. As such, Tree 4 is a small Date palm (*Phoenix canariensis*) that is on the exempt species list and does not require Council consent for removal.
- 3.11** The area between the existing building and the proposed development site near Tree 6 contains several Heath Banksia (*Banksia ericifolia*) that would be considered to be small shrubs.

4 RECOMMENDATIONS

4.1 Trees 1- 6 are not significant trees to the site and are proposed to be removed for the purpose of the development.

4.2 It would appear the only area available for compensatory planting are the road verges which are ultimately Council property. The Dudley Street frontage has existing power lines and as such a small shrub species rather than a tree species is recommended.

4.3 Some suggested species that grow well under power lines and require minimal ongoing pruning are as follows:

- *Acmena smithii* var 'Minor' Dwarf Lilly
- *Albizia julibrissin* Silk Tree
- *Angophora hispida* Dwarf Apple
- *Buckinghamia celsissima* Ivory Curl Flower
- *Banksia ericifolia* Health-leaved Banksia
- *Banksia robur* Swamp Banksia
- *Callistemon citrinus* Crimson Bottlebrush
- *Callistemon salignus* 'Eureka' Eureka Willow Bottlebrush
- *Callistemon viminalis* Weeping Bottlebrush
- *Gordonia axillaris* Fried Egg Plant
- *Hakea salicifolia* Willow-leaved Hakea
- *Hakea sericea* Silky Needle
- *Leptospermum laevigatum* Coast Tea Tree
- *Leptospermum petersonii* Lemon-scented Tea Tree
- *Melaleuca bracteata*
- *Melaleuca ericifolia*

If you have any questions in relation to this report please contact me.



Paul Vezgoff

Consulting Arborist

Dip Arb (Dist), Arb III, Hort cert, AA, ISA

31 May 2013



www.mooretrees.com.au

5 IMAGES



Plate 1: Tree 1. P. Vezgoff.



Plate 2: Trees 2 and 3. P. Vezgoff.



Plate 3: Trees 4 (Red arrow) and the hedge. P. Vezgoff.



Plate 4: Image showing Tree 6 and the extensive pruning for wire clearance. P. Vezgoff.

Appendix 1

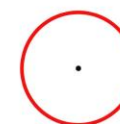
Plan 1

Tree Location Plan



Tree Location Plan

MOORE TREES



Tree to be removed

Not to scale.



Date: 26.5.13
 Drawn: P.Vezgoff
 Site Address: New Dapto Street
 Wollongong NSW

Appendix 2

Tree health & condition **assessment schedule**

TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE – 3-11 Dudley Street, Wollongong NSW

Tree	species	Height (m)	Spread (m)	DBH (mm)	Live canopy %	Defects	SULE	Condition	Age	Comments	TPZ (m)	SRZ (m)
1	Frangipani (Plumaria acutifolia)	4	3	200	100	No visual defects	2a May only live for 15-40 years	Good	Mature	On asymmetrical lean	2m	1m
2	Willow gum (Eucalyptus scoparia)	15	5	300	90	Storm damage, Deadwood.	3a May only live for 5-15 years.	Fair	Mature	Codom with tree 3	3.5	2.5
3	Willow gum (Eucalyptus scoparia)	13	5	350	90	Storm damage	3a May only live for 5-15 years.	Fair	Mature	Codom with tree 2	3.5	2.5
4	Date palm (Phoenix canariensis)	4	4	500	100	No visual defects	5a Small tree <5 m in height.	Good	Mature	Exempt from TPO		
5	Murraya paniculata	3	1.5	Multi	100	No visual defects	5a Small tree <5 m in height.	Good	Mature	Hedge planting.	1	1
6	Tallowwood (Eucalyptus microcorys)	13	3.5	360	80	No Value	2a May only live for 15-40 years	Fair	Mature	Lopped for power line clearance on western side.	4	2.5

KEY

Tree No: Relates to the number allocated to each tree for the Tree Protection Plan.

Height: Height of the tree to the nearest metre.

Spread: The average spread of the canopy measured from the trunk.

DBH: Diameter at breast height. An industry standard for measuring trees at 1.4 metres above ground level, this measurement is used to help calculate Tree Protection Zones.

Live Crown Ratio: Percentage of foliage cover for a particular species.

Age Class: Young:	Recently planted tree	Semi-mature:< 20% of life expectancy
Mature:	20-90% of life expectancy	Over-mature:>90% of life expectancy

SULE: See SULE methodology in the Appendix 3

Tree Protection Zone (TPZ): The minimum area set aside for the protection of the trees trunk, canopy and root system throughout the construction process. Breaches of the TPZ will be specified in the recommendations section of the report.

Structural Root Zone (SRZ): The SRZ is a specified distance measured from the trunk that is set aside for the protection of the trees roots both structural and fibrous.

Appendix 3

SULE categories (after Barrell, 2001)¹

SULE Category	Description
Long	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
1a	Structurally sound trees located in positions that can accommodate for future growth
1b	Trees that could be made suitable for retention in the long term by remedial tree care.
1c	Trees of special significance that would warrant extraordinary efforts to secure their long term retention.
Medium	Trees that appeared to be retainable at the time of assessment for 15-40 years with an acceptable level of risk.
2a	Trees that may only live for 15-40 years
2b	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons
2c	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide for new planting.
2d	Trees that could be made suitable for retention in the medium term by remedial tree care.
Short	Trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable level of risk.
3a	Trees that may only live for another 5-15 years
3b	Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
3c	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
3d	Trees that require substantial remedial tree care and are only suitable for retention in the short term.
Remove	Trees that should be removed within the next five years.
4a	Dead, dying, suppressed or declining trees.
4b	Dangerous trees because of instability or loss of adjacent trees
4c	Dangerous trees because of structural defects
4d	Damaged trees not safe to retain.
4e	Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
4f	Trees that are damaging or may cause damage to existing structures within 5 years.
Small	Small or young trees that can be reliably moved or replaced.
5a	Small trees less than 5m in height.
5b	Young trees less than 15 years old but over 5m in height.

1 (Barrell, J. (2001) "SULE: Its use and status into the new millennium" in *Management of mature trees*, Proceedings of the 4th NAAA Tree Management Seminar, NAAA, Sydney.

Appendix 4

TPZ and SRZ methodology

Determining the Tree Protection Zone (TPZ)

The radius of the TPZ is calculated for each tree by multiplying its DBH x 12.

$$\text{TPZ} = \text{DBH} \times 12$$

Where

DBH = trunk diameter measured at 1.4 metres above ground

Radius is measured from the centre of the stem at ground level.

A TPZ should not be less than 2 metres no greater than 15 metres (except where crown protection is required.). Some instances may require variations to the TPZ.

The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1 metre outside the crown projection.

Determining the Structural Root Zone (SRZ)

The SRZ is the area required for tree stability. A larger area is required to maintain a viable tree.

The SRZ only needs to be calculated when major encroachment into a TPZ is proposed.

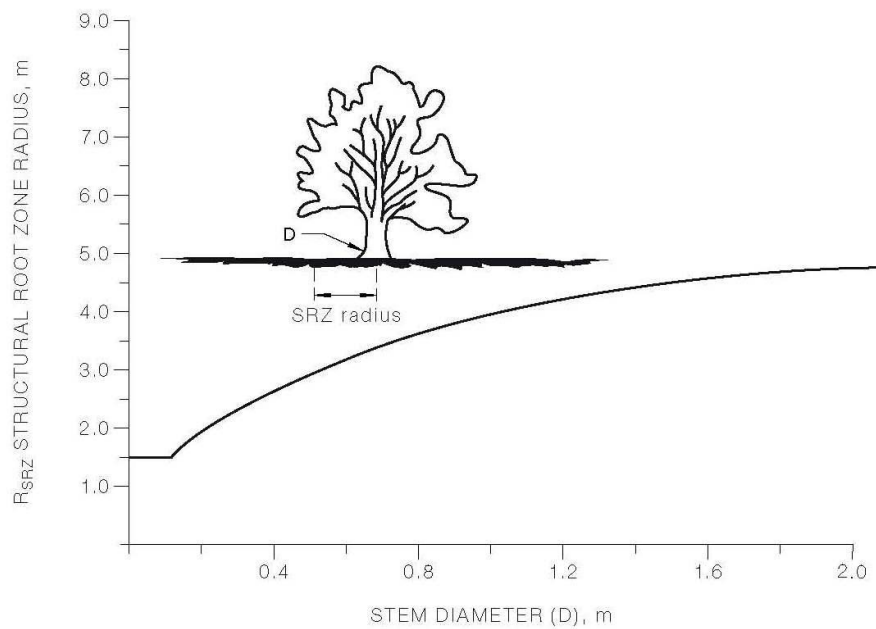
There are many factors that affect the size of the SRZ (e.g. tree height, crown area, soil type, soil moisture). The SRZ may also be influenced by natural or built structures, such as rocks and footings. An indicative SRZ radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula or Figure 1. Root investigation may provide more information on the extent of these roots.

$$\text{SRZ radius} = (D \times 50)^{0.42} \times 0.64$$

Where

D = trunk diameter, in m, measured above the root buttress

NOTE: The SRZ for trees with trunk diameters less than 0.15m will be 1.5m (see Figure 1).



The curve can be expressed by the following formula:
 $R_{SRZ} = (D \times 50)^{0.42} \times 0.64$

FIGURE 1 - STRUCTURAL ROOT ZONE

Notes:

- 1 R_{SRZ} is the structural root zone radius.
- 2 D is the stem diameter measured immediately above root buttress.
- 3 The SRZ for trees less than 0.15 metres diameter is 1.5 metres.
- 4 The SRZ formula and graph do not apply to palms, other monocots, cycads and tree ferns.
- 5 This does not apply to trees with an asymmetrical root plate.

Appendix 5

Explanatory Notes

- **Mathematical abbreviations:** > = Greater than; < = Less than.
- **Measurements/estimates:** All dimensions are estimates unless otherwise indicated. Less reliable estimated dimensions are indicated with a '?'.
- **Species:** The species identification is based on visual observations and the common English name of what the tree appeared to be is listed first, with the botanical name after in brackets. In some instances, it may be difficult to quickly and accurately identify a particular tree without further detailed investigations. Where there is some doubt of the precise species of tree, it is indicated with a '?' after the name in order to avoid delay in the production of the report. The botanical name is followed by the abbreviation sp if only the genus is known. The species listed for groups and hedges represent the main component and there may be other minor species not listed.
- **Height:** Height is estimated to the nearest metre.
- **Spread:** The maximum crown spread is visually estimated to the nearest metre from the centre of the trunk to the tips of the live lateral branches.
- **Diameter:** These figures relate to 1.4m above ground level and are recorded in centimetres. If appropriate, diameter is measured with a diameter tape. 'M' indicates trees or shrubs with multiple stems.
- **Estimated Age:** Age is estimated from visual indicators and it should only be taken as a provisional guide. Age estimates often need to be modified based on further information such as historical records or local knowledge.
- **Distance to Structures:** This is estimated to the nearest metre and intended as an indication rather than a precise measurement.

Appendix 6

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Standards Australia Ltd

Sydney

Curriculum Vitae

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EDUCATION and QUALIFICATIONS

- 2007 – Diploma of Arboriculture (AQF Cert V) Ryde TAFE. (Distinction)
- 1997 – Completed Certificate in Crane and Plant Electrical Safety
- 1996 – Attained Tree Surgeon Certificate (AQF Cert II) at Ryde TAFE
- 1990 – Completed two month intensive course on garden design at the Inchbald School of Design, London, United Kingdom
- 1990 – Completed patio, window box and balcony garden design course at Brighton College of Technology, United Kingdom
- 1989 – Awarded the Big Brother Movement Award for Horticulture (a grant by Lady Peggy Pagan to enable horticulture training in the United Kingdom)
- 1989 – Attained Certificate of Horticulture (AQF Cert IV) at Wollongong TAFE

INDUSTRY EXPERIENCE

Moore Trees Arboricultural Services

January 2006 to date

Tree Consultancy and tree ultrasound. Tree hazard and risk assessment, Arborist development application reports
Tree management plans.

Woollahra Municipal Council

Oct 1995 to February 2008

ARBORICULTURE TECHNICAL OFFICER

August 2005 – February 2008

Tree asset management, programmed inspection, inventory and condition surveys of council trees, hazard and risk appraisal,
Tree root damage investigation and reporting, assessment of impacts of capital works projects on council trees.

ACTING COORDINATOR OF TREES MAINTENANCE

June – July 2005, 2006

Responsible for all duties concerning park and street trees. Prioritising work duties, delegation of work and staff supervision.

TEAM LEADER

January 2003 – June 2005

TEAM LEADER

September 2000 – January 2003

HORTICULTURALIST

October 1995 – September 2000

Northern Landscape Services

July to Oct 1995

Tradesman for Landscape Construction business

Paul Vezgoff Garden Maintenance (London, UK)

Sept 1991 to April 1995

CONFERENCES AND WORKSHOPS ATTENDED

- International Society of Arboriculture Conference (Brisbane 2008)
- Tree related hazards: recognition and assessment by Dr David Lonsdale (Brisbane 2008)
- Tree risk management: requirements for a defensible system by Dr David Lonsdale (Brisbane 2008)
- Tree dynamics and wind forces by Ken James (Brisbane 2008)
- Wood decay and fungal strategies by Dr F.W.M.R. Schwarze (Brisbane 2008)
- Tree Disputes in the Land & Environment Court – The Law Society (Sydney 2007)
- Barrell Tree Care Workshop- Trees on construction sites (Sydney 2005).
- Tree Logic Seminar- Urban tree risk management (Sydney 2005)
- Tree Pathology and Wood Decay Seminar presented by Dr F.W.M.R. Schwarze (Sydney 2004)
- Inaugural National Arborist Association of Australia (NAAA) tree management workshop- Assessing hazardous trees and their Safe Useful Life Expectancy (SULE) (Sydney 1997).