

## Arborist Report

Commissioned By:	Root Projects Australia Level 5, 23-31 Macquarie Place SYDNEY NSW 2000
Site:	MCA Redevelopment Project
Date:	25 / 11 / 08
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#### Summary

Australis Tree Management has been commissioned by Root Projects Australia Pty Ltd on behalf of the Museum of Contemporary Art (MCA) to prepare an arborist report. This report will be used for the project planning application for the MCA's proposed redevelopment. It aims to identify the health and condition of the trees, potential impacts of the proposed development on the trees and to provide recommendations regarding tree removals and retentions.

During November 2008, Australis Tree Management inspected the site and surrounding area of the existing Museum of Contemporary Art building and inspected twenty eight (28) trees, which are located within the vicinity of the proposed redevelopment.

A modified Tree Survey Form (Matheny & Clark 1994) was completed along with supporting photographs of the trees.

The proposed design for the redevelopment of the MCA will involve the removal of trees within the vicinity of the existing car parking facility , West Circular Quay and George Street. The redevelopment includes new landscaping, which provides an opportunity to improve the visual amenity of the area by planting more suitable trees that will tolerate the environmental conditions.

The Jacaranda trees surveyed were in poor form and stunted caused by salt winds and soil compaction. The assorted Palm Trees were also small in size and of little significance. The dominant Chinese Nettle Trees are likely to have self sown and are a vigorously growing species and also of little significance. Tree no 28 a Sydney Blue Gum may require pruning for construction work clearance.

A detailed tree schedule is included in Appendix a.

Tree defects and symptoms that were encountered have been discussed on page 12.

In summary:

- \* the trees to be removed to enable the redevelopment of the MCA have no major environmental or habitat value.
- \* tree no. 25 must be protected during construction.

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#### Abbreviations

LGA	Local Government Authority
NPWS	National Parks and Wildlife Service
TSC Act	Threatened Species Conservation Act, 1995
NW Act	Noxious Weeds Act, 1993
RPA	Root Protection Area
TPO	Tree Preservation Order

## Figure 1. Location Map

Museum of Contemporary Art 140 George St, Sydney.



Source: Googleearth.com





## 1.0 Introduction

1.1 **Brief:** I am instructed by Root Projects Australia Pty Ltd to inspect the selected trees at the Museum of Contemporary Art at 140 George St, Sydney including trees on surrounding streets. Preparation of an arboricultural report on the potential impacts on the trees from the proposed MCA redevelopment to be submitted as part of the planning application.

#### 1.2 **Aims:**

- \* Undertake field surveys for tree health, condition and life expectancy.
- \* Conduct a literature review on tree defects and assess potential development impacts.
- \* Locate and identify trees on supplied site survey maps.
- \* Search databases for relevant tree species information including Tree Preservation Order's.
- \* Provided recommendations regarding alterations to the proposed development for the retention of trees.
- \* Provide tree protection measures.
- 1.3 **Qualifications and experience:** I have based this report on my site observations and the provided information, and I have come to conclusions in the light of my experience and follow up research. I have level 5 qualifications in arboriculture and include a summary in Appendix g.
- 1.4 **Acknowledgements:** The following documents and information were provided by Root Projects Australia Pty Ltd.
  - \* Existing site plan with tree locations (Appendix c).
  - \* Proposed site plans with tree locations (Appendix c).
  - \* Arboricultural Assessment Garry Clubley, Arborist and Landscape Consultant dated April 2008.
- 1.5 **Scope of this report:** This report is only concerned with health and condition of the subject tree and the potential impacts from the proposed development. It takes no account of root mapping or invasive structural strength assessments of the trees. It includes a detailed assessment based on the site visit and the documents provided, listed in 1.4 above.

Recommendations may be provided regarding alterations to the proposed development for the retention of trees.

1.6 **Proposed Development:** Proposed is the redevelopment of the MCA site. This will involve the removal of trees within the vicinity of the existing car parking facility, West Circular Quay and George Street. The redevelopment includes new landscaping, which provides and opportunity to improve the visual amenity of the area by planting more suitable trees for the site.

## 2.0 **Methodology**

- 2.1 **Methods:** The following relevant information was compiled for consideration of the proposed works. All photographs were taken by me during the site visit.
  - \* **Tree Survey Form** (Matheny & Clark, 1994), which includes tree identification, dimensions, age, condition etc. Definitions in appendix a.
  - \* **Safe Useful Life Expectancy** (Barrell, J. 2001), which indicates suitability for retention. Definitions in appendix e.
  - \* **Root Protection Area** (BS 5837 2005) appendix f.

#### 2.2 **Species identification**;

- \* PHILLIPS, R. (1978) Trees in Britain, Europe and North America.
- \* ROWELL, R.J. (1991) Ornamental Flowering Trees in Australia.
- \* JONES, D.L. (1996) Palms In Australia, Over 450 Native and Exotic Species.
- 2.3 **Tree Measurements:** Tree trunk diameters are measured with a diameter tape at 1.3m high. Tree heights measured with a clinometre.
- 2.4 **Tree Preservation Order**: Trees no. 1 13, 18, 19, 21 and 23- 28 are protected under The City of Sydney Tree Preservation Order (2004) This Order applies to any tree (whether exotic, endemic or indigenous) with:
  - (i) a height equal to or exceeding five (5) metres OR
  - (ii) for a single trunk species, a trunk circumference of 300mm at a height of one metre above ground level; OR
  - (iii) for a multi-trunk species, a trunk circumference exceeding 100mm at a height of one (1) metre above ground level.

Exempt species: *Celtis spp* – Only if height is less than 10m and diameter at 1.0m is less than 300mm.

#### 2.5 **Legislation:** The following databases were searched and sited.

- \* Biodiversity Guide for NSW Local Government
- \* Environment Protection and Biodiversity Conservation Act 1999
- \* Noxious Weeds Act 1993
- \* Threatened Species Conservation Act 1995
- \* Tree Protection Act 2005

## 3.0 Site Visit and Observations

- 3.1 **Field visit:** I carried out the unaccompanied site visit on the 20<sup>th</sup> and 24<sup>th</sup> of November 2008 and I spent approximately 2 hours on site. All my observations were from ground level without detailed investigations. The weather at the time of inspections on the 20<sup>th</sup> was rainy and wet with poor visibility and on the 24<sup>th</sup> clear and sunny with good visibility.
- 3.2 **Threatened Species:** NSW State (*Threatened Species Conservation Act, 1995*). The subject tree species identified are not listed in the act.
- 3.3 **Noxious Weeds:** NSW State (*Noxious Weeds Act, 1993*) The subject tree species are not listed in the act.
- 3.4 **Brief site description:** The Museum of Contemporary Art is located in the city suburb of The Rocks and near Circular Quay. The MCA is on the eastern side of the road and surrounded by public parkland and a Police Station. The surrounding topography is relatively flat and the site is exposed to salt winds.
- 3.5 **Identification and location of the trees:** The trees in question are located to the east, west and north east to the MCA building and have been located on the supplied site plans and identified accordingly. These plans are for illustrative purposes only and it should not be used for directly scaling measurements.
- 3.6 **Collection of basic data:** From inspection of the trees and I collected information on species, height, diameter and maturity, which is recorded in the tree schedule included as Appendix a. The inspection was of a preliminary nature and did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level.
- 3.7 **Tree significance:** It is suggested that the Chinese Nettle Trees are likely to have self sown therefore of little significance. The Jacaranda trees are also in poor condition and failing to perform well.

## 4.0 Summary of Results

A complete survey of all trees is located in appendix A.

#### 4.1 **Trees proposed for retention.**

Table 1.

Tree No.	Species / Common name	SULE
25	Populus deltoides (American Black Poplar	3C
28	Eucalyptus saligna (Sydney Blue Gum)	2B

#### 4.2 **Trees proposed for removal**.

Table 2.

Tree No.	Species / Common name	SULE
1	Jacaranda mimosifolia (Jacaranda)	3C
2	Livistona australis (Cabbage Palm)	2C
3	Livistona australis (Cabbage Palm)	2C
4	Livistona australis (Cabbage Palm)	2C
5	Livistona australis (Cabbage Palm)	2C
6	Livistona australis (Cabbage Palm)	2C
7	Livistona australis (Cabbage Palm)	2B
8	<i>Jacaranda mimosifolia</i> (Jacaranda)	3C
9	<i>Jacaranda mimosifolia</i> (Jacaranda)	3C
10	Jacaranda mimosifolia (Jacaranda)	3C
11	<i>Jacaranda mimosifolia</i> (Jacaranda)	3C
12	<i>Jacaranda mimosifolia</i> (Jacaranda)	3C
13	<i>Jacaranda mimosifolia</i> (Jacaranda)	3C
14	Fraxinus griffithii (Evergreen Ash)	5A
15	Fraxinus griffithii (Evergreen Ash)	5A
16	Fraxinus griffithii (Evergreen Ash)	5A
17	Phoenix canariensis (Canary Island Date Palm)	3C
18	Celtis sinensis (Chinese Nettle Tree)	$4\mathrm{F}$
19	Celtis sinensis (Chinese Nettle Tree)	$4\mathrm{F}$
20	Celtis sinensis (Chinese Nettle Tree)	$4\mathrm{F}$
21	Celtis sinensis (Chinese Nettle Tree)	4F
22	Celtis sinensis (Chinese Nettle Tree)	5A
23	Celtis sinensis (Chinese Nettle Tree)	4F
24	Celtis sinensis (Chinese Nettle Tree)	4F
26	Celtis australis (European Nettle Tree)	3B
27	Celtis australis (European Nettle Tree)	3B

\*SULE- Safe Useful Life Expectancy (Barrell, 2001)

## 5.0 **Discussion**

#### 5.1 **Trees proposed for retention.**

- 5.1.1 Tree no. 25 *Populus deltoides* (American Black Poplar) is located on Argyle St and proposed for retention. It is in good health but exhibiting poor canopy form.
- 5.1.2 Tree no. 28 *Eucalyptus saligna* (Sydney Blue Gum) is located within the foot path towards the southern end of the MCA building and is exhibiting adequate health and condition. The tree is likely to require pruning to provide adequate clearance for the proposed works. This pruning must be in accordance with Australian Standards for Pruning of Amenity Trees AS-4373-2007. All pruning must be made as close as possible to the branch collar or branch bark ridge, without cutting the collar.

#### 5.2 **Trees proposed for removal.**

- 5.2.1 Jacaranda mimosifolia (Jacaranda) Trees no. 1, 8 13 are all located within the proposed new landscaping area and are in poor form, stunted growth and twig dieback from salt winds. Salt spray damage is generally confined to the portion of the canopy exposed to wind-driven spray. Along the coast, for instance, the greatest damage would be on the windward side of the plant... Foliage of broadleaf plants may show marginal necrosis, defoliation, premature fall colouration, and delayed spring leafout (Costello and others, 2003). The root zones of Jacarandas 8 11 are in heavily compacted soil. Compaction of soils is a major cause of tree problems. After the top layer of the soil is compacted, roots begin to die. Death of roots in compacted soils is due to lack of oxygen as well as to lack of water. Roots do require oxygen to respire or to function properly. Non woody and woody roots may not grow into dense soils (Shigo, 1986).
- 5.2.2 *Livistona australis* (Cabbage Palm) Trees no. 2 7 are young palm trees generally in adequate health and condition. The tallest palm is approximately 8m in height. These trees are located within the proposed new landscaping and are proposed to be removed.
- 5.2.3 *Fraxinus griffithii* (Evergreen Ash) Trees no. 14 16 are all young and small trees that are also located within heavily compacted soils. These trees are proposed for removal due to their location within the re-landscaping.
- 5.2.4 *Phoenix canariensis* (Canary Island Date Palm) Tree no. 17 is located north of the row of Chinese Nettle Trees. The palm is young, small in adequate health.
- 5.2.5 *Celtis sinensis* (Chinese Nettle Tree) Trees no. 18 24 are a row of trees is located at the edge of the existing car parking facility and West Circular Quay. These trees are highly visible and the most dominant part of the landscape. The species is vigorous in growth and known to easily self-seed. The trees are in adequate health though some have pruning wounds with areas of potential decay. The lawn area adjacent to the tree is raised by 50cm to 1m, though the trees do not appear to be suffering from root suffocation. Some bark inclusions were sited

within the trees. Included bark means inner and outer bark that forms between the expanding cylinder of the branch and the trunk. The vascular cambium "turns" inward within the branch-trunk crotch. The branch bark ridge also turns inward to form an invaginated structure. The expanding wedge greatly weakens the branch and may cause it to break off under very slight loading (Shigo, 1986).

5.2.6 *Celtis australis* (European Nettle Tree) 26 & 27 are semi mature trees growing on the George St foot path and will require removal for the proposed works. They are in adequate health though a limb has been torn out of the trunk of tree no. 26 leaving an extensive wound. Both trees are planted close to the curb and likely to cause damage to the foot path and road surface in the future. Tree no 25 is causing cracking to the existing pebbled soil cover. Given the vigorous growth root systems this species is not recommended for the particular location.

See Glossary for further information.

#### 6.0 **Conclusion & Recommendations**

After inspecting the trees within the vicinity of the MCA site and follow up research I came to the following conclusions.

6.1 *Jacaranda mimosifolia* (Jacaranda) Trees no. 1, 8 - 13 are small, stunted and have poor form caused by salt winds and compacted soils. This species is not suited to this environment.

Recommendation – The trees are not worthy of retention and should be removed.

6.2 *Livistona australis* (Cabbage Palm) Trees no. 2-7 are in adequate health and condition, though young and small. These trees can be can be relocated if required but may be too costly.

Recommendation – The palms should be removed.

6.3 *Fraxinus griffithii* (Evergreen Ash) Trees no. 14 – 16 are also all young and small trees of no significance.

Recommendation - The trees should be removed.

6.4 *Phoenix canariensis* (Canary Island Date Palm) Tree no. 17 is young and small and of no significance.

Recommendation – The palm should be removed.

6.5 *Celtis sinensis* (Chinese Nettle Tree) Trees no. 18 – 24 are vigorous in growth and known to easily self-seed. The trees are in adequate health but with numerous pruning wounds and defective branch attachments.

Recommendation – The trees are not worthy of retention or causing redesign the development and should be removed.

6.6 *Celtis australis* (European Nettle Tree) 26 & 27 are in adequate health tree no. 26 has a wound on the trunk. The species is not suited to long term retention in this situation due to their vigorous growth and root systems.

Recommendation – The trees are not worthy of retention or causing redesign the development and should be removed.

6.7 *Eucalyptus saligna* (Sydney Blue Gum) tree no. 28 is in adequate health and may be pruned to allow construction work clearance.

Recommendation – Pruning be in accordance with AS4373- 2007 by a suitably qualified arborist.

Signed,

msill

Meredith Gibbs. Dip Hort (Arb). M.I.S.A. M.I.S.A.A.C. M.A.I.H. Australis Tree Management

## 7.0 Tree Protection Measures

These specifications are for the trees identified on adjoining properties and any tree that may be selected for retention.

- 7.1 A 1.8m chain wire fence with concrete footings placed according to tree protection zones. Tree protection zone distances measured from the tree trunk.
- 7.2 Shade cloth must be attached to protective fencing to prevent run off or building materials from entering the tree protection zone.
- 7.3 Signage Tree Protection Zone, No entry. To be attached to the protective fencing.
- 7.4 No storage of building wastes or materials should occur within tree protection zones.
- 7.5 No vehicle or heavy foot traffic will occur within the tree protection zones.
- 7.6 During occupation all tree protection zones and trees must be monitored, assessed and recorded by a qualified arborist according to council's requirements.
- 7.7 All care must be given not to injure any part of the tree during construction.
- 7.8 Any work that must occur within a tree protection zone requires the tree trunk to be protected with wooden boards surrounding the tree trunk.
- 7.9 Any work that must occur within a tree protection zone must be witnessed and directed by a qualified Arborist.
- 7.10 All trees must be thoroughly water once a week and mulched with a composted leaf mulch no thicker than 70mm.
- 7.11 No activity within the Tree Protection Zone during construction including landscaping (garden installation) or cultivation unless approved by a qualified arborist.
- 7.12 Any pruning required must be in accordance with AS 4373 (2006). *Pruning of Amenity Trees*, Standards Australia, Standards Association of Australia, NSW, Australia and completed by level 3 qualified arborist.
- 7.13 Monitoring and documentation should regular occur to council's requirements.



#### 8.0 **Pruning Locations**

Australian Standards for Pruning of Amenity Trees. AS4373-2007



(a) Up to but not including the branch collar



(b) In the absence of a collar using the branch bark ridge

Ap	pendix	а
- <b>-</b> P	penan	u

## **Tree Schedule**

# **Tree Schedule Definitions** (Matheny & Clark, 1994) modified

Location:	N	S Nature St	rip <b>O</b> S	S On Site	<b>AP</b> Ac	djoining P	roperty		
<u>DBH:</u>	Di	ameter at b	reast height	(1.3m)					
Dimensions:	Ap	proximate 1	height, cano	opy spread	d				
<u>Type:</u>	Ē	<b>d</b> emic <b>I</b>	<b>nd</b> igenous	Native	Noxious v	veed Pla	anted 1	<b>Rem</b> nant	<b>S</b> eeded
Age Class:	Y	Young- rece	ently planted		<b>S</b> Semi	mature- <	20% of li	ife expectanc	:y
	M	Mature- 20-	-80% of life e	expectancy	<b>O</b> Over	mature- >	80% of l	ife expectanc	су
Crown Class:	D	Dominant c	rown extend	s above ge	neral canop	oy; not rest	ricted by	other trees.	
	С	Co-dominat	nt crown for	ms the bull	k of the gen	eral canop	y but cro	owded by oth	er trees.
	Ι	Intermediat	e crown exte	nds into de	ominant/ c	o dominan	t canopy	but quite cr	owded on
		all sides.							
	S	Suppressed	crown develo	opment res	stricted fron	n overgrow	ving trees	5.	
Crown Condi	tior	<u>n:</u> Overall vig	gour and vita	lity					
	0	Dead							
	1	Severe decli	ne (<20% ca	nopy dens	sity; major c	lead wood)	)		
	2	Declining (2	20-60% cano	py density	; twig and b	ranch dieb	oack)		
	3	Average / le	ow vigour (60	) <b>-</b> 90% can	opy density	; twig dieb	ack)		
	4	Good (90-10	00% canopy	density; lit	tle or no di	eback or ot	ther prob	olems)	
	5	Excellent (1	00% canopy	density; n	o deadwood	d or other p	problems	5)	
Root Zone:	Cı	<b>np</b> Compac	tion	<b>D</b> Dama	ged / woun	ided roots	ER Exp	posed roots	
	Ga	<b>t</b> Tree in gar	den bed	<b>Gi</b> Girdle	ed roots		<b>Gr</b> Gra	ISS	
	K	Kerb close to	o tree	L+ Raise	d soil level		<b>M</b> Mul	lched	
	LF	<ul> <li>Lifting Pave</li> </ul>	ement	L- Lower	red soil leve	el	<b>Pa</b> Pavi	ing etc	
Wildlife:	S S	Scats	<b>M</b> Markir	ngs <b>N</b>	Nests	<b>TH</b> trunk	hollow	<b>BH</b> Bran	ch hollow
Services / Ad	jace	ent structures	<u>:</u> <b>H</b> House	F	Fence	<b>G</b> Garage		<b>PL</b> Powe	rlines
Defects:	<b>A</b> /	Ants		<b>B</b> Borers			<b>BI</b> Basa	al Inclusion	
	BV	🛿 Basal Wou	nd	C Cavity			<b>D</b> Deca	ıy	
	DI	L Decline		<b>DW</b> Dead	dwood		EP Epi	cormic Grow	/th
	<b>F</b> 1	Fruiting bodi	es	HW Hare	dware (nails	s, wire)	I Inclus	sions	
	K	Kino		<b>L</b> Lean			LP Lop	ped	
	M	<b>A</b> Multiple A	ttachments	MT Mult	i trunks		<b>PF</b> Prev	vious failures	
	S S	Sap		<b>SB</b> Splits.	/ Cracks		SCI Sca	affold Inclusi	on
	T '	Termites		<b>TH</b> That	imasticorid		<b>TI</b> Tru	nk Inclusion	
	T۱	🛿 Trunk Wo	und	W Wound	d				

## Appendix b Photographs



Figure 3. Trees no. 1 to 8.



Figure 4. Trees no. 9 & 10.



Figure 5. Trees no. 11 & 12.



Figure 6. Tree no. 13.



Figure 7. Trees no. 15 & 16.



Figure 8. Trees no. 17 – 24.



Figure 9. Raised garden bed.



Figure 10. Trees no. 26 & 27.



Figure 11. Tree no. 28.

## Appendix cPlan 1Existing Site Plan







#### Appendix d Glossary

Shigo, A.L. (1986) A New Tree Biology Dictionary, Shigo and Trees Associates, New Hampshire, USA.

\*Docktor, D (2001) *City of Palo Alto, Tree Technical Manual*, The City of Palo Alto Department of Planning and Community Environment. Palo Alto, California, USA.

Bark*	All tissue outside the vascular cambium. Bark is usually divided into inner bark
	active phloem and aging and dead crushed phloem.
Basal	Lower trunk area of the tree.
Branch*	Organ which supports leaves, flowers and fruit.
Branch collar*	Trunk tissue that forms around the base of a branch between the main stem and the
	branch wood and trunk wood to meet. Formed b y compaction or expansion as the
	girth of the branch and trunk increase.
Canopy	The part of the crown composed of the leaves and small twigs
Cavity	An open wound, characterized by the presence of decay and resulting in a hollow.
	(Matheny & Clarke, 1994).
Co dominant sten	<b>ns*</b> Stems or trunks of about the same size originating from the same position
	from the main stem.
Compaction	Compaction of soils causes roots to die due to lack of oxygen and water.
Compartmentaliz	<b>ation*</b> Dynamic tree defence process involving protection features that resist the
	spread of pathogens.
Crown*	Portion of the tree consisting of branches and leaves and any part of the trunk from
	which branches arise.
Decay*	Degeneration and delignification of plant tissue, including wood, by pathogens or
	micro organisms.
Decline	Decline is a general loss of vitality over the entire tree either caused by a systemic
	disease or by a series of events that disrupt the essential life processes.
Dieback	Dieback is the reduction in the dynamic mass of a tree as twigs and branches die and
	are walled off by protection boundaries.
Epicormic shoots	* Shoots produced by dormant buds within the bark or stems of a tree as a result of
	stress, lopping or increase light. Epicormic shoots usually have a weaker form of
	branch attachment.
Hollows	Hollows from when wood-digesting microrganisms digest wood within the
	boundaries set by the reaction zone or the barrier zone.
Included bark*	Inwardly formed bark at the junction of branches or codominant stems.
Kino	A dark red to brown resin-like substance produced by the trees in the genera
	<i>Eucalyptus</i> and other related genera. Kino forms when living cells are injured and
	infected.
Live Crown Ratio	The size of the canopy of coniferous trees relative to their overall height.
Lopping*	Random cutting of branches or stems between branch union or at internodes on
	young trees.
Mycorrhiza	A symbiotic, non pathogenic, or weakly pathogenic association of fungi and non
	woody, absorbing roots of plants. The common belief is that the mycorrhiza help the
	tree with mineral absorption, especially phosphorus.
Microorganisms	An organism of microscopic size. Bacteria, the tree pathogens, may be as small as 3
<b>D</b> 1	microns wide by 5 microns long.
Pathogen	Any agent that causes disease.
Photosynthesis	A process where chlorophyll in plants traps the energy of the sun in a molecule of
<b>D</b>	carbon dioxide and water that is called sugar.
KOOTS	An organ of a tree that serves to maintain mechanical support, to provide water and
6	essential elements from the soil through absorption, and to store energy reserves.
Stem <sup>*</sup>	Urgan which supports branches, leaves flowers and fruit.
1 ree*	Long lived woody perennial plant greater than (or potentially greater than) 3m in
ጥ 1 ፊ	neight with one or relatively lew stems.
	I ne main stem.
wound*	An opening that is created when the bark is cut, removed or injured.

#### Appendix e Safe Useful Life Expectancy Categories

Barrell 2001 (Updated 01/04/01)

**1: Long** SULE: Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.

- (a) Structurally sound trees located in positions that can accommodate future growth.
- (b) Trees that could be made suitable for retention in the long term by remedial tree care.
- (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.

**2: Medium** SULE: Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk.

- (a) Trees that may only live between 15 and 40 more years.
- (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
- (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.
- (d) Trees that could be made suitable for retention in the medium term by remedial tree care.

**3: Short** SULE: Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk.

- (a) Trees that may only live between 5 and 15 more years.
- (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
- (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.
- (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

**4: Remove:** Trees that should be removed within the next 5 years.

- (a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- (b) Dangerous trees because of instability or recent loss of adjacent trees.
- (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- (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.

**5: Small, young** or regularly pruned: Trees that can be reliably moved or replaced.

- (a) Small trees less than 5m in height.
- (b) Young trees less than 15 years old but over 5m in height.
- (c) Formal hedges and trees intended for regular pruning to artificially control growth.

## Appendix f Extract from BS 5837 (2005)

- 5.1 Root protection area (RPA)
- 5.1.1 The RPA should be calculated using Table 2 as an area equivalent to a circle with a radius 12 times the stem diameter for single stem trees and 10 times basal diameter for trees with more than 1 stem arising above 1.5m above ground level.

Number of stems	Calculation
Single stem tree	$RPA (m^2) = (\underline{stem \ diameter \ (mm) \ @. \ 1.5m \ x \ 12)^2} x \ 3.142$ 1000
Trees with more	
than one stem	RPA (m <sup>2</sup> ) = (basal diameter (measured immediately above root flare (mm) x 10) <sup>2</sup> x
arising below	3.142
1.5m above	1000
ground level	

NOTE The 12 x multiplier is based on NJUG 10 (9) and published work by Matheny & Clark (10)

- 5.1.2 The calculated RPA should be capped to 707m<sup>2</sup> (which is equivalent to a circle with a radius of 15m or a square with approximately 26m sides.
- 5.2 The RPA may change in shape, but not reduce its area whilst still providing protection for the root system.
  - (a) The likely tolerance of the tree to root distribution or damage is based on factors such as species, age and condition, and the presence of other trees. (For individual open grown trees only, it may be acceptable to offset the distance by up to 20% in one direction only (see note 1 of 11.3.5.)

11.3.5

1. Any excavations which have to be undertaken with the RPA should be carried out carefully by hand, avoiding damage to protective bark covering larger roots. Roots, while exposed, should be wrapped in dry, clean hessian seeking to prevent desiccation and to protect from rapid temperature changes. Roots less than 25mm in diameter may be pruned back, preferably to a side branch, using a proprietary cutting tool such as bypass secateurs or a hand saw. Roots over 25mm in diameter should only be severed following consultation with an arborist, as they may be essential to the trees health and stability.

## Appendix g Qualifications and Experience



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Advanced Certificate in Urban Horticulture, 1999 Horticulture Diploma (Arboriculture), Level 5, 2002 Occupational Health & Safety course 2002 Risk Management course 2002 Smart Train 008397 (valid to 2008) Quantified Tree Risk Assessment Licence 2008 Currently studying – Advanced Diploma in Applied Environmental Management

#### 2. Practical experience:

Australis Tree Management, Consulting Arborist. (Owner/Operator) Jan 2000 Silver Springs Nursery. (Owner/Operator) Feb 1997 Neil Clayton Lawns & Gardens. (Horticulturist) Mar 1998 – Apr 2001 Davidson's Nurseries Pty Ltd. (Horticulturist) Feb 1996 – Mar 1998

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International Society of Arboriculture International Society of Arboriculture Australian Chapter Australian Institute of Horticulture

#### 4. Continuing professional development:

NAAA Conference, Mature Trees, 2001. Claus Mattheck Seminar 2001. ISAAC Conference 2004. AILA Tree Management Forum 2005. Jeremy Barrell Tree AZ & Report Writing Workshop 2006 A Practitioner's Guide to Visual Tree Assessment – Mike Ellison 2007 Quantified Tree Risk Assessment Workshop – Mike Ellison 2007 ISAAC Conference 2008 ISAAC Conference Workshop Dr. David Lonsdale 2008 ISAAC Conference Workshop Phillip Gibbons 2008









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