Arboricultural Implication Assessment and Arboricultural Method Statement

For proposed apartment development 39-41 Chertsey Avenue, Bankstown, NSW



Compiled for Ghazi Al Ali Architect 9 Redmyre Road, Strathfield, NSW 2135.

Prepared 15th August, 2015 by Victor John Molyneaux B.E.;M.Eng.Sc.;M.B.A.; AQF Level 5 Arboriculture



Horticultural Resources Consulting Group Admin Postal Address: PO Box 1020 Eastwood NSW 2122 Sydney NSW 2000 Tel: (02) 9874 9888 Fax: (02) 9874 9899

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Executive Summary

An arborist assessment of the existing trees and the proposed development activities has been undertaken and found that:-

- There are no actual site trees worthy of retention. However the two front street trees will be retained and adequately protected.
- All neighbour's trees and shrubs surrounding the site were examined and assessed for any potential impact from the proposed development. No adverse effects are anticipated although one of these trees will need to be placed under management, as it is in severe decline this course of action has the neighbour's blessing.
- This report has three main subject areas;-

Section 1 details the formal assessment made of each tree, categorizes them using internationally accepted approaches and makes recommendations about the trees that are valued and suitable for retention and those that should be removed.

Section 2 formally assesses the impact of the proposed excavation, building, pipe work hydraulics and landscaping activities on the trees that are to be retained. The findings are that there are likely to be no significant negative effects on the trees to be retained.

Section 3 details the Root Protection Area requirements and all procedures required to safeguard the trees.

SECTION 1 FORMAL ASSESSMENT OF SITE TREES

Introduction

Client details

This report is undertaken on behalf of Ghazi Al Ali Architect, 9 Redmyre Road, Strathfield NSW 2135. Phone: (02) 806 515 44 Email : office@ghazia.com

Arborist Details

The site arboricultural survey and report compilation has been carried out by Victor John Molyneaux, Consulting Arborist with the Horticultural Resources Consulting Group. The HRC Group postal address is PO Box 1020 Eastwood NSW 2122. Telephone number (02) 9874 9888 Fax: (02) 9874 989. Email contact (preferred) victormolyneaux@hotmail.com mobile number 0410 755 338

Victor John Molyneaux has a Civil Engineering degree and Masters degrees in Science and Business Administration. Victor is a seasoned Arborist physically working with removal of large trees and progressing with his Arboriculture studies through all level of TAFE certification to Diploma Level 5 and migrating to a consulting Arborist role in his senior years. His extensive engineering background coupled with tree morphology knowledge is valued by project developers and building contractors.

Disclosure of any pecuniary or non pecuniary interests

Victor John Molyneaux and the HRC Group have no pecuniary or non pecuniary interests whatsoever.

The purpose of the report.

This Implication Study and Arboricultural Method Statement has been compiled to manage the existing trees during the planning and construction of the proposed apartment development 39-41 Chertsey Avenue, Bankstown, NSW.

This analysis has been undertaken to assess the established trees of the site destined for redevelopment, then assist with sound arboricultural advice to manage the existing trees during the planning, design and construction of the proposed residential re-development, including the definition of required tree protection measures, obtaining local government approval for the removal and pruning of relevant trees.

The short-term objectives are to assess the condition of each tree and assess their longer-term worth, and then determine their ability and the impact of the proposed development activities. When the actual site trees that will be retained are better defined, the report then develops practical and implementable measures for the long-term protection and tree stewardship.

Tree Data collection

An initial inspection and tree survey was undertaken on 9th August, 2015 to establish the high values tree(s) and interact with the design development process and then a site visit on 12th August to verify tree locations and soil conditions.

There were fifteen (15) significant trees, palms and tree groups observed on site and neighbouring blocks. These trees were numbered as shown in Appendix 1. A visual tree assessment was undertaken by Arborist, Victor John Molyneaux. All significant trees on site and neighbouring properties were identified and defined with a summary of key measurements and observations summarised in Table 1.

More detailed field notes are available if required and pictures of each tree are included in Appendix 2 so a detailed description is not included in this report.

Survey Plan

A detailed Survey Plan for the site was compiled by Michael Shannon & Associates Pty Ltd dated 8-05-2015 which clearly shows the position of most referenced site trees.

Status

The recommendations of this report are based on several discussions with Meng Jiang from Ghazi AI Ali Architects and their project plans and a Landscape Plan by Conzept Landscape Architects dated August 2015

A DA submission being imminent this is the draft edition of this arboricultural based report to brief all parties and may be superseded with typos corrected and any last minute amendments to the design.

The Site

The subject property consists of two (2) amalgamated residential blocks totaling about 1900 square metres in a quiet suburban area. The site has an AHD elevation of about 17 to 18 metres – relatively flay observed areas of water pooling. Average annual rainfall for the localized area is rather low for medium sized trees estimated as being about 850 mm per annum.

Soils

Soils of this immediate area are typical of the Blacktown Soil Landscape Group (as classified in the Soil Landscapes of the Sydney 1:100,000 Sheet) ¹, consisting of graduating rises on Wianamatta Group shales and Hawkesbury shales. These local soils

¹ GA Chapman & CL Murphy (1989)

Soil Landscapes of the Sydney 1:100,000 Sheet

Soil Conservation Service of NSW. Sydney

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are known for their low soil fertility and poor soil drainage.

The site soil has been significantly disturbed and compacted by vehicles in both the front yard and rear yards.

This site can therefore sustain large native trees provided supplemental irrigation is available during periods of extended drought.

The Original Vegetation

The original vegetation of this area consisted of a Eucalypt overstory woodland and tall semi-open sclerophyll Forest² which is now mostly cleared form existence in the local area.

It is important to appreciate the indigenous vegetation which proved over millennia to be the appropriate species of the localized area. However, it is also important to note at this juncture that the annual rainfall is now lower and more variable, further most rainfall on residential blocks is now captured and piped from the site, **so sustaining the large native Eucalypts (or other mature large trees) is now not feasible without reliable supplemental irrigation.**

With an appreciation of the above **Soils** and **Original Vegetation** circumstance, we are pleased to note that the proposed Landscape Plant Schedule specifies enduring natives. These are considered sustainable provided they are established with supplemental irrigation and mulching.

Appendix 2 displays a photograph of each significant tree

² Urban Bushland By Oculus Landscape Architecture Urban Design Environmental Planning April 2001 Booklet and Map

TABLE 1 SHRUBS and TREES MEASUREMENTS and OBSERVATIONS SUMMARY

	Ref. No.		AREA													
ld	Species	Maturity	Height	All	S N	prea	d E	W	DBH	Health	Condition	Age	ULE	Landscape Significance	Retention Value	End verdict
1	<i>Lophostemon</i> <i>confertus,</i> Brush box Prominent position street tree on nature strip outside No. 41	М	4.5	4					340	Good maintained under service wires	stable, good foliage cover	40	40+	SIGNIFICANT	HIGH	Retain and Protect
2	Lophostemon confertus, Brush box Prominent position street tree on nature strip outside No. 39	М	4.5	2					240	Mushroom shaped dwarfed but good	stable, good foliage cover	40	40+	SIGNIFICANT	HIGH	Retain and Protect
3	Nerium oleander Oleander Front yard boundary fenceline of No 37	М	6	3					malli	Poorly maintained untidy but neighbour's	vigorous	20	15+	LOW	LOW	PROTECT Neighbour's shrub - no stress issues to be concerned about
4	<i>Lagerstroemia indica,</i> <i>Crape Myrtle</i> Front yard boundary fenceline of No 37	м	7	3					Mallie form eq 320	good	vigorous	18	15+	MEDIUM	MEDIUM	PROTECT Neighbour's shrub
5	Syzygium paniculatum, Brush Cherry mid property No. 37 fenceline	ом	9	4					430	Poor – in decline struggling dieback	Defoliated and extensive deadwood	40	7	Low	Low	RETAIN neighbour's tree Construction stress will further impact this failing tree
6	Murraya paniculata, Murraya,	SM	4	1					140	good	vigorous	5	15+	LOW	LOW	Remove low amenity shrub of no retention value
7	<i>Melaleuca linariifolia,</i> Snow-In-Summer	ом	12		7	3	5	5	790	Leaning at 45 degrees to North blown over when in formative stage	Poor form extensive dead wood completely misshaped	50	7	Low As deformed	low	REMOVE as unlikely to be sustain- able and very poor condition form

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8	Ligustrum lucidum, Large Leaved privet	м	6				260	Weed species remove						Remove weed
9	<i>Callistemon viminalis,</i> weeping bottle brush	м	10	6.5			290 300 340 250	Four main limbs all with included stem junctions so not worthwhile changing design to retain as large branches will soon fail due to structural instability	An excellent spreading tree at the end of its useful life with good foliage density	20	7	Medium	LOW Structural Issues	REMOVE to facilitate the development
10	<i>4X Nerium oleander</i> Oleander	м	4	3			Mallie form	Weed species remove	No amenity value					Remove weeds
11	3 X X Cupresocyparis leylandii, Leyland Cypress neighbour's privacy hedge No 36 2 M from boundary	М	6	3			280 350 270	Well maintained in virile condition	Excellent	30	20+	Medium	Medium	RETAIN neighbours screening trees
12	Archontopheonix cunninghamiana, Bangalow palm Neighbour's Palm	м	10	2.5			280	Strong, good foliage cover	good	30	40+	medium	medium	RETAIN PROTECT neighbour's palm
13	Archontopheonix cunninghamiana, Bangalow palm	М	10	2.5			280	Strong, good foliage cover	good	30	40+	medium	medium	REMOVE a Palm will not fit landscape concept
14	Syzygium paniculatum, Brush Cherry	М	7	3			265	Struggling, defoliated on boundary but project side Very poor condition	Poor	25	7	LOW	LOW	REMOVE Poor health Preference for new screen planting
15	Callistemon viminalis, weeping bottle brush	М	4	1.5			230	Lopped re-growth – has lost form	Good but poor specimen	25	0	LOW	LOW	REMOVE and replace with better style for Landscape concept

Height is measured in metres from ground level to the highest point of the tree using tape measures and clinometers.

Diameter at breast height (DBH) is measured and rounded down to the nearest ten millimeters at 1.4m above ground level using specialist tapes. Where a tree divides into multiple stems below 1.4m it will be measured at a representative point above the root flare to give a clear indication of equivalent trunk mass or the relative dimensions of several trunks are given.

Canopy spread is measured in metres listing North, South East then West extent in metres. Symmetrical canopies have only two entries.

Maturity is divided into young, semi-mature, mature, over mature, and veteran or senescent. This is an indication of which stage a tree is at in its natural life cycle, allowing for an assessment of how energy and growth will be prioritised within a tree. In general, younger trees are more able to cope with disturbance or stress.

Biological health and physiological condition are assessment of the health and vigour of the trees and include an evaluation of the size, colour and density of the foliage. Trees in good physiological condition are better able to cope with disturbance or stress.

Structural health and mechanical condition is an indication of the structural integrity of the tree. This is given as good, average, fair or poor.

Amenity value is a qualitative value sometimes mentioned which is assessed using a combination of factors such as species, size and location, also a tree in a similar group of trees has a higher amenity value.

Initial Category Ratings

Category ratings are now allocated based on the current condition of a tree in its current surroundings <u>assuming the recommendations of this report are carried out.</u> No consideration is given to any specific development proposal when allocating category ratings.

Category A – a HIGH tree retention rating is given for trees which have high visual amenity value, are in good structural and physiological condition and are expected to contribute for at least another 40 years.

Category B - **MODERATE tree retention rating for trees** which would be considered as category A trees but which are of lower value, poorer structural condition, or which are expected to contribute for less than 40 years.

Category C - a LOW tree retention rating are those which have low amenity value, are in poor condition, or are expected to contribute for less than 20 years.

Category R trees are those which are expected to contribute for less than 10 years due to serious defects. As is common in risk management, where there is doubt, the

precautionary principal may be applied. In certain circumstances trees may be considered of higher value due to cultural or ecological reasons.

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#	<i>Botanical Name/</i> Common Name	Category
1	<i>Lophostemon</i> <i>confertus, Brush box</i> Prominent position street tree on nature strip outside No. 41	CATEGORY A HIGH RETAIN AND PROTECT street tree
2	Lophostemon confertus, Brush box Prominent position street tree on nature strip outside No. 39	CATEGORY A HIGH RETAIN AND PROTECT street tree
	Nerium oleander	CATEGORY C LOW
3	Oleander Front vard boundary	Retain neighbour's tree
	fenceline of No 37	This is a weed species and not under threat from the development
	Lagerstroemia indica,	CATEGORY B Medium
4	boundary fenceline of No 37	Retain neighbour's tree
		CATEGORY C LOW
5	Brush Cherry mid	Retain neighbour's tree
	property No. 37 fenceline	This tree is in decline and will be subject to further stress from this development
6	Murraya paniculata,	CATEGORY C LOW
	Murraya,	Remove unwanted shrub
		CATEGORY C LOW
7	<i>Melaleuca linariifolia,</i> Snow-In-Summer	REMOVE as this tree has fallen over and still survives – its shape and poor state makes it not suitable for retention – it can not be incorporated into the landscape concept plan
8	Ligustrum lucidum, Large Leaved privet	CATEGORY R Remove (weed)
		CATEGORY B MEDIUM
	Callistemon viminalis	Remove to facilitate the development
9	weeping bottle brush	Has suspect branch junctions would lose branches in the future if retained
10	4X Nerium oleander Oleander	CATEGORY R REMOVE (Weeds)
11	3 X X Cupresocyparis	CATEGORY B MEDIUM

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	<i>leylandii,</i> Leyland Cypress neighbour's privacy hedge No 36 2 M from boundary	Retain neighbour's trees
12	<i>Archontopheonix</i> <i>cunninghamiana,</i> Bangalow palm Neighbour's Palm	CATEGORY B MEDIUM Retain neighbour's palm
13	<i>Archontopheonix</i> <i>cunninghamiana,</i> Bangalow palm	CATEGORY B MEDIUM Remove –Palm would not suit intended landscape Concept Plan
14	Syzygium paniculatum, Brush Cherry	CATEGORY C LOW Unhealthy tree in severe decline - REMOVE
15	<i>Callistemon viminalis,</i> weeping bottle brush	CATEGORY C LOW misshaped shrub severely loped a very poor specimen

Preliminary assessment of retention value of site trees.

From Table 1 and 2 there are many trees low amenity value trees, shrubs and palms that are impractical to retain on this developments site and they should be eliminated from further assessment.

Preferred Trees

The two street trees should be retained and protected.

Also all neighbour's trees will be retained.

There are no actual site trees that are worthy of further consideration as the proposed Landscape Concept Plan will not benefit with any existing site trees to be retained.

It will be recommended that a Level 5 Project Arborist to be appointed with an approved budget to provide, install and maintain the Tree Protection Fencing around the street trees and the neighbours trees.

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Final Considerations

Final considerations about the retention value of the trees can now be made. First by appreciating the allocated tree category in the table above before any development implications are considered, then considering the proposed development pressures that will be placed on the trees, with any conservation or remedial measures we can incorporate.

After due consideration of this evaluation process and the proposed development stress imposed on retained Trees 1, 2, 3, 4, 11 and 12, it is our considered opinion it would be practical to retain and protect these trees.

It should be noted at this juncture that neighbour's Tree 5 is in severe decline. The tree will be dead by natural causes within about 5 years. It is not considered appropriate to place undue concerns on conservation measures to conserve this tree. Further the neighbouring site is destined for redevelopment in the near future. This declining tree will not be retained in any site re-development next door.

The owner of the neighbouring property will be contacted and requested to consider submitting a Tree Management Application requesting that the tree be removed.

Height of crown clearance of the all trees to be retained appears to be satisfactory. There are no concerns about the lower branches of trees being damaged during the construction process by machinery and materials movement.

Soil Compaction is a serious issue in the critical root zone of all trees and the protected tree will need to be fenced off from any machinery or building material storage.

Recommendations

Recommendation 1

That Trees; 6, 7, 8, 9, 10, 13, 14 and 15 be removed for the stated reasons.

Recommendation 2

That neighbour's Tree 5 be placed under separate management. It is likely that a Tree Management Application signed by the owner will be lodged with Council for the tree removal in parallel with this project DA if Council officers are concerned about thus tree. OR the neighbouring site will lodge its own DA application in the not too distant future which will include the removal of this dying tree. This tree has a very limited life expectancy and it is not appropriate to spend any substantial effort to retain and protect a dying tree. Tree 5 has sufficient space to comply with AS4970 so the development can proceed with this tree insitu. It is just flagged at this juncture that this tree is dying and some mechanism to have it legally removed will eventually be applied. However, it is not appropriate for the project to recommend its removal of a neighbour's tree under this development Application and it should be considered a separate case.

This report assumes that this tree will be retained. The intimate fate of this tree will depend on the result of the Tree Management Application or the DA for the neighbouring property in due course.

Recommendation 3

That a Level 5 Project Arborist be appointed to inspect and document with Certificates of Compliance to the certifying authority as stipulated in SECTION 5 MONITORING AND CERTIFICATION of AS4970-2009

PROJECT PHASE	ACTIVITIES	PROJECT ARBORIST to
Initial Site Preparation	Establish/delineate TPZs Install protective measures and undertake soil rehabilitation for Trees 1 and 2 Certification of tree protection measures	Project Arborist to mark Tree Protection Zones and install fences, mulch, irrigation and signage Issue a Certification of Compliance of tree protection measures being in place and soil rehabilitation undertaken
Construction work	Liaison with site manager, compliance and any deviation from approved plan	Maintain or amend protective measures Supervision and monitoring formal notification of any deviation from approved tree protection plan
100mm PVC pile installation through TPZ, Implement hard and soft landscape works	Installation of pipes, irrigation services Control of compaction work Installation of pavement and retaining walls and fences	Install pipework, remove selected protective measures as necessary and perform remedial tree works Issue a Certificate of Compliance
Practical completion	Tree vigour and structure assessment and undertake soil rehabilitation for Trees 1 and 2.	Remove all remaining tree protection measures Certification of tree protection and soil rehabilitation for Trees 1 and 2
Defects liability/ maintenance period	Tree vigour and structure	Undertake any required remedial tree works Certification of tree protection if necessary

Recommendation 4

To proceed with the proposed development layout and apply appropriate tree protection measures.

SECTION 2 ARBORICULTURAL IMPACT ASSESSMENTS

The Architect sought arboricultural advice about the *"tree constraints"* of this site and how best to protect the two street trees.

Through an interactive design process in liaison with the arborist, the geometry of the proposed buildings, driveways, provision for tanks, pits and storm water pipes reflects a sound development layout that will not adversely impact on the protected trees.

Distances for Tree Protection Zones

The Australian Standard for the Protection of Trees on Development Sites AS 4970-2009 suggests a setback of 12 times the trunk diameter as a guide to a Tree Protection Zone (TPZ). The intent is to avoid damage to major roots by severing or by soil compaction. In ideal situations there should be no excavation or construction within the Tree Protection Area in order to ensure that there is no damage to the root network. There will definitely not be any excavation allowed in the Structural Root Zone as specified in AS4970.

Protective fencing

The protective fence for all neighbour's trees will be using temporary fencing panels and incorporation them into the parameter safety fence.

Two additional square enclosure around Tree 1 and Tree 2 using 50X50 mm 2.1 M high (at least 300 mm into the ground – so use a 2.4 M lengths), hardwood stakes surrounded by shadecloth with Tree Protection Signage will be used. Tree protection and prohibited activities signs should be attached to each enclosure. The TPZ fencing shall be a rigidly formed around the tree to allow easy passing by cars and pedestrians.

The main purpose of these enclosures it to protect the tree trunks and lower branches for materials handling incidents that are extremely common on all construction sites. The tree areas will be fertilized and watered by the Project Arborist before, during and after the construction works.

Care should also be taken to prevent fenced areas being knocked or contaminated with chemical spillages, including petrol, diesel and oils. In addition, water run-off from areas of construction activity should be diverted away from the fenced area.

Unless otherwise specified in this report the fenced protection areas should be considered complete construction exclusion zones; there should be no pedestrians, vehicles, materials, equipment or machinery in the critical root fenced area. There should be adequate signs informing all relevant persons that access is denied.

The soil moisture surrounding the root ball areas of Trees 1 and 2 shall be monitored on a regular basis.

Table 3 defines the tree protection zone, areas available and incursions into the tree driplines. According to the generous allowance preferred by Australian Standard 4970 there would be adequate tree protection areas for the retained trees.

Position of Trees under Protection



TABLE 3 TREE PROTECTION ZONES AND ROOT AREAS AVAILABLE

Tree	Name	DBH	SRZ	work in	12 DBH	Actual Area	Comments
		mm	М	SRZ	radius M	immediately	
					sq area	available %	
1	Lophostemon confertus,	340	2.1	None Intentionally by design	4.08 52 sq M 10% intrusion 2.8 M	52 square metres	No dripline encroachment Development is 8.8 M distant OK ARBORICULTURALLY ACCEPTABLE
	Brush box						DESIGN
2	<i>Lophostemon</i> <i>confertus,</i> Brush box	240	1.82	None Intentionally by design	2.9 M 26 sq M 10% intrusion 2.0 M stockpile 3.3 metres distant OK	26 square metres	No dripline encroachment Development is 8.8 M distant OK ARBORICULTURALLY ACCEPTABLE DESIGN
3	Nerium oleander Oleander Front yard boundary fenceline of No 37	Mallie form Eq 280	1.9	No activity	3.4 M 10% slice allows 2.3 M from development	Development is allowable distance away.	Development wall is about 2.3 M away sufficiently away for this tree which is protected by communal fence TPZ Fence with TPZ signs ACCEPTABLE DESIGN
4	<i>Lagerstroemia</i> <i>indica, Crape</i> <i>Myrtle</i> Front yard boundary fenceline of No 37	Mallie form Eq	1.9	No activity	3.4 M 10% slice allows 2.3 M from development	Development is allowable distance away.	Development wall is about 2.3 M away sufficiently away for this tree which is protected by communal fence TPZ Fence with TPZ signs ACCEPTABLE DESIGN
5	<i>Syzygium</i> <i>paniculatum,</i> Brush Cherry mid property No. 37 fenceline	430	2.3		5.1 M 83 sq M 10% intrusion <mark>3.5M</mark>	83 sq M	There is about 3.5 M available for this tree which is mostly garden bed. The distance is sufficient to comply with AS4970 however this failing tree will experience construction related stresses from this project. As discussed the tree does not warrant any significant tree conservation measures and it is already dyeing will be removed by a TMA of by the redevelopment of the neighbouring block. No further consideration of this tree is deemed necessary.

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	3 X X Cupresocyparis	280		4.2 M 55 sq M	55 Sq M	Development is 7.7 M distant OK ARBORICULTURALLY ACCEPTABLE
	leylandii, Leyland	350	2.1	10% intrusion 2.9M		DESIGN
11	Cypress neighbour's privacy hedge No 36 2 M from boundary	270				
12	Archontopheonix cunninghamiana, Bangalow palm Neighbour's Palm	280		4 M 50 sq M 10% intrusion 2.9 M	50 sq M	Development is 9 M distant No issues ARBORICULTURALLY ACCEPTABLE DESIGN

Development Impact Assessment

The design layout as shown on the plan has been assessed in accordance with British BS5837:2005 Section 6 plus the generous Root Protection Zone areas of AS4970 and the findings are that there are likely to be no significant negative effects on the trees to be retained:-

- The building structures are located outside an acceptable distance for the species.
- Absolutely no development activity is required within the Structural Root Zone (SRZ)
- Stormwater pipes installation with TPZs will be supervised by the Project Arborist.
- Tree drip-lines are not encroached
- The retained trees are a significant distance away from any proposed living space and are unlikely to cause undesired or excessive shade to either the house or the usable garden space.
- All services will be excluded from the TPZ except the outlets pipework which will be supervised by the Project Arborist.

The Project Arborist will be onsite if necessary, during this minimal excavation for pipe excavation/installation to ensure that no significant tree roots are damaged or severed if at all possible.

SECTION 3 TREE MANAGEMENT AND PRESERVATION Preparation for development

Protective fencing

The protective fences should be constructed around Trees 1 and 2 as specified on page 13. The site perimeter fencing will sufficiently protect trees using temporary fencing panels with tree protection and prohibited activities signs.

The temporary fencing panels should be constructed in such a way as to exclude construction activity and be appropriate to the degree and proximity of likely works. A minimum of one hundred and eighty centimeter (180cm) high weld mesh panels securely fixed onto a braced scaffold framework are usually suitable. Standard temporary fencing panels area acceptable. The Project Arborist will be directly involved in the layout of the fencing and indicate where it is to be installed by yellow spray paint.

Care should also be taken to prevent fenced areas being knocked or contaminated with chemical spillages, including petrol, diesel and oils. In addition, water run-off from areas of construction activity should be diverted away from the fenced area.

Unless otherwise specified in this report the fenced protection areas should be considered complete construction exclusion zones; there should be no pedestrians, vehicles, materials, equipment or machinery in the critical root fenced area. There should be adequate signs informing all relevant persons that access is denied.

Soil Rehabilitation

The area around and defined by the Tree 1, Tree 2 and tree 5 driplines will be rehabilitated on two occasions. Before the commencement of site activities when the tree protection fence in installed, and then when the fence is removed. On both occasions the Project Arborist will:-

- Water thoroughly and apply a soil wetting agent eco-hydrate preferred.
- Apply Seasol® to stimulate and promote new root growth
- Apply mycorrihiza inoculant beneficial micro- biological organisms so that the existing root system can assimilate high amounts of nutrients Neutrog juice preferred
- • Fertilize the tree surrounds with soluble nutrients and absorbable nitrogen compounds
- Supply and apply a 70-00 mm mulch layer depth and maintain a 50mm clearance from the trunk.
- Monitor for vigour, stability, pest and disease.

The soil moisture surrounding the root ball area shall be monitored on a regular basis. Should an irrigation system be installed advice from the Consulting Arborist shall be sought in regard to volume and frequency of water applied.

Penalty Infringement Notices

Council has introduced a policy of inspections of Tree Protection Fencing on Development Sites. If the fences are not adequately installed and or materials or spoil stockpiles are within the Tree Protection Zone, the council may issue penalty infringement notices to the builder, typically \$1,500 or \$3,000.

Site inspections

A program of Project Arborist inspections, operations and the issue of formal Certificates of Compliance to the certifying authority will be undertaken. Every opportunity should be taken to explain to the builder, sub-contractors and owner the necessity of the tree protection effort.

It is very important that the Project Arborist be present on site when any excavation near Tree 1 is undertaken to ensure roots that maybe uncovered are identified and evaluated. Accurate and clinical severing of any tree roots will be necessary in the unlikely event that they are located under the driveway.

Development Phase

The Root Protection Zone (RPZ)

The Root Protection Zone (RPZ) is the area of ground which is desirable to leave undisturbed during development. AS4970 and BS5837:2005 specifies an idealized circle around the tree trunk 10-12 times the tree trunk diameter at breast height.

Table 3 defines the preferred areas set aside for the trees and the indicative Root Protection Zone fencing as does Appendix 1. It is proposed to erect an enclosure around tree 1 using standard temporary fencing panels. <u>The site fencing layout will be defined</u> <u>onsite by the Project Arborist and installed.</u>

The Project Arborist will personally erect and place the signage of the fixed Tree Protection fence. Under no circumstances is this fence to be moved to facilitate ease of construction or allow more excavation to install formwork etc. without the Project Arborist present. All sub-contractors are to be briefed about the importance of care in these sensitive locations.

Appendix 1 Shows fenced Root Protection Zones dotted in yellow

Changes in ground level

Ground levels should not be lowered within the tree root protection area as this would cause serious damage to tree roots. Soil levels can not be raised as this will starve the roots of oxygen and nutrients.

Occasionally ground levels may need to be raised within the tree root protection area. This can be achieved by the use of a granular material with a no fines content to allow the vertical diffusion of gasses. A detailed plan agreed by the assigned Project Arborist would be needed in such cases.

Removal of protective fencing

When the development phase is complete, all drainage and service runs are in place, and the main site machinery has been removed, the protective fencing may be dismantled. This must be done with care and should be supervised by the Project Arborist. Any post holes should be filled with river sand. A soil rehabilitation program around Tree 1 will be undertaken at this stage.

Post Construction Landscaping

The trees on the site will be subject to landscaping or seeding beneath the canopy after the main development phase has been completed. At this stage, it is inevitable that the protective fencing will have to be removed. In view of this fact, the landscaped works should be carried out in such a way as to avoid ground level changes or deep digging. Tractor mounted tillers or other mechanised cultivation methods should be avoided near the tree.

No heavy machinery should be brought into the vicinity of trees to be retained. Herbicides should be appropriate for the purpose and should not be used in such a way as will damage any vegetation to be retained. Where possible, it is preferable for the trees to be located within a mulched, shrub planted, garden bed. This minimises long term disturbance or compaction to the tree rooting environment and encourages occasional irrigation by the residents.

During the summer months all three trees should be irrigated by hand. Some organic matter and granular material is to be added to the soil to aid water penetration around the protected trees.

Completion meeting

Upon completion, it is proposed that the Project Arborist and the Local Authority's Tree Management officer are invited to meet on site to check that all works are completed satisfactorily and to discuss any remedial works required. A Compliance Certificate will be issued to the Compliance Authority at this time.

I trust the draft edition this report dated, 15th August, 2015 provides all the required information to progress the project. However, if further advice is needed then please contact me.

Victor John Molyneaux

B.E.;M.Eng.Sc.;M.B.A.; Diploma Level 5 Arboriculture

General guidance

All tree works should be carried out by suitably qualified, experienced and insured contractors in accordance with Australian Standard 4373-1996 - Pruning of Amenity Trees and the WorkCover Code of Practice for the Amenity Tree Industry.

This report is based upon a visual survey. The consultant shall not be responsible for events which happen after the date of survey due to factors which were not apparent at the time of the survey.

Any defects seen by a contractor that were not apparent to the consultant must be brought to the consultant's attention immediately.

No liability can be accepted by the consultant in respect of the trees unless the recommendations of this report are undertaken within the time period recommended.

It is advisable to have trees of any concern regularly surveyed by a suitably qualified and experienced arboricultural consultant. In this instance it is recommended that these surveys are made every two years.



Horticultural Resources Consulting Group

Admin Postal Address: PO Box 1020 Eastwood NSW 2122 Sydney NSW 2000 Tel: (02) 9874 9888 Fax: (02) 9874 9899





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I Name/ Common Name	Category					
n confertus, Brush box sition street tree on nature No. 41	CATEGORY A HIGH RETAIN AND PROTECT street tree					
on confertus, Brush box sition street tree on nature No. 39	CATEGORY A HIGH RETAIN AND PROTECT street tree					
nder	CATEGORY C LOW					
undary fenceline of No 37	Retain neighbour's tree This is a weed species and not under threat from the development					
ia indica, Crape Myrtle Front	CATEGORY B Medium					
y fenceline of No 37	Retain neighbour's tree					
	CATEGORY C LOW					
aniculatum, Brush Cherry	Retain neighbour's tree					
No. 37 tenceline	This tree is in decline and will be subject to further stress from this development					
iculata Murrava	CATEGORY C LOW					
realiana, monoya,	Remove unwanted shrub					
	CATEGORY C LOW					
nariifolia, Snow-In-Summer	REMOVE as this tree has fallen over and still survives – its shape and poor state makes it not suitable for retention – it can not be incorporated into the landscape concept plan					
icidum, Large Leaved privet	CATEGORY R Remove (weed)					
	CATEGORY B MEDIUM					
viminalis, weeping bottle	Remove to facilitate the development					
	Has suspect branch junctions would lose branches in the future if retained					
leander	CATEGORY R REMOVE (Weeds)					
	CATEGORY B MEDIUM					
<i>paris leylandii</i> , Leyland ghbour's privacy hedge No 36 ndary	Retain neighbour's trees					
eonix cunninghamiana,	CATEGORY B MEDIUM					
Im Neighbour's Palm	Retain neighbour's palm					
eonix cunninghamiana,	CATEGORY B MEDIUM					
Im	Remove –Palm would not suit intended landscape Concept Plan					
niculatum Brush Cheme	CATEGORY C LOW					
incomenty, prostronelly	Unhealthy tree in severe decline - REMOVE					
viminalis, weeping bottle	CATEGORY C LOW					
	misshaped shrub severely loped a very poor specimen					

ld	Species	Picture
1	<i>Lophostemon confertus,</i> Brush Box Prominent position street tree on nature strip outside No. 41	
2	<i>Lophostemon confertus,</i> Brush Box Prominent position street tree on nature strip outside No. 39	
3	Nerium oleander Oleander Front yard boundary fenceline of No 37	

4	<i>Lagerstroemia indica,</i> <i>Crape Myrtle</i> Front yard boundary fenceline of No 37	
5	Syzygium paniculatum, Brush Cherry mid property No. 37 fenceline	
6	Murraya paniculata, Murraya,	



10	<i>4X Nerium oleander</i> Oleander	
11	3 X X Cupresocyparis Ieylandii, Leyland Cypress neighbour's privacy hedge No 36 2 M from boundary	
12	Archontopheonix cunninghamiana, Bangalow palm Neighbour's Palm	

13	Archontopheonix <i>cunninghamiana,</i> Bangalow palm	
14	Syzygium paniculatum, Brush Cherry	
15	<i>Callistemon viminalis,</i> weeping bottle brush	

STRICTLY ENFORCED TREE PROTECTION ZONE

Lophostemon confertus, Brush Box NO MATERIALS TO BE STORED WITHIN SIX (6) METRES OF THIS TREE

Appointed Consultant Arborist

Victor John Molyneaux B.E.;M.Eng.Sc.;M.B.A.; Level 5 Arboriculture *Horticultural Resources Consulting Group* Admin Postal Address: PO Box 1020 Eastwood NSW 2122 Sydney NSW 2000 Tel: (02) 9874 9888 Fax: (02) 9874 9899

PROHIBITED ACTIVITIES

in TREE PROTECTION ZONES

No entry of machinery. No soil stockpile.

No Storage of heavy building materials.

No Parking of any kind. Erection or placement of site facilities.

Removal or stockpiling of soil or site debris.

Disposal of liquid waste including paint and concrete wash. Excavation or trenching of any kind. No Placement of waste disposal or skip bins.

Strictly Enforced call Project Arborist - Victor on 0410 755 338