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Re Arboricultural Impact Assessment (AIA) for 135 Seaforth Cres, Seaforth

Prepared by

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Standfast Tree Services Pty Ltd

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1 Introduction

- 1.1.1 This AIA has been commissioned by Nick McCarthy of Urban Escape to look at the likely impacts that the existing trees at 135 Seaforth Cres, Seaforth will be subjected to if the proposed swimming pool and deck areas are constructed.
- 1.1.2 This report will comply with AS 4970-2009, Protection of trees on development sites.
- 1.2.1 Nine trees will be within the footprint or 5m of the proposed works and they are the subject of this AIA.
- 1.2.2 The property lies within the Northern Beaches LGA and the trees are subject to Council's Tree Preservation Order¹ in particular:
 - I) Trees over 5m high are protected by the TPO
 - II) *Olea* spp (olive trees) are on Council's Exempt Tree Species List
- 1.2.3 The property is not within the RFS 10/50 Clearing Entitlement.²
- 1.3.1 The Landscape Concept Plan prepared by Urban Escape and dated 1/5/2019 has been marked up to show the TPZs and SRZs of retained trees, T1, T3, T4, T8, T10 and T11 to generate the Tree Protection Plan (drawing) please refer to Appendix 1.

¹ <https://www.northernbeaches.nsw.gov.au/planning-development/tree-management/private-land>

² <https://www.rfs.nsw.gov.au/plan-and-prepare/1050-vegetation-clearing/tool>

- 1.4.1 A site visit was undertaken on 30/9/2019 when visual tree assessments (VTAs)³ from ground level were made of the trees and photographs and measurements were taken. Please refer to figure 1 for a photograph of the proposed development site.

2 Findings

- 2.1.1 Measurements and estimations of the vigour, TPZs and SRZs of the trees are found in Table 1 below. For definitions of terms please refer to Appendix 2, Terminology.

- 2.1.2 Trees within (4) and close (1) to the proposed footprint T2, T5, T6, T7 and T8 have been recommended for removal:

- I) T2, T5 and T8 approximately 6m – 10m high *Callitris rhomboidea* have been previously top-lopped and have been assessed with poor condition as a result.
- II) T6, an approx. 8m high *Glochidion ferdinandi* also has poor condition because it has been suppressed by adjacent trees and has no canopy in the eastern hemisphere.
- III) T7 is a poor specimen with DBH approx. 0.1m and height approx. 7m.

- 2.1.3 Trees that would be retained:

- I) T3, *Callitris rhomboidea*, T8, *Glochidion ferdinandi*, and T10, *Glochidion ferdinandi*
- II) T1 a *Washingtonia robusta* under 5m high and T11 an *Olea europaea* an exempt species will most likely be retained although neither one is protected under Council's TPO.
- III) T4, *Callitris rhomboidea*, and T9, *Eucalyptus* spp, are both more than 5m from the development and have not been assessed for the AIA.

- 2.1.4 Retained trees that would require tree protection measures as specified in AS 4970 2009, Protection of trees on development sites: T1, T3 and T8.

- I) The TPZ of T1 will be encroached by approx. 18%⁴ and the SRZ by approx. 10%.
- II) The TPZ of T3 will be encroached by approx. 7% and there would be no encroachment of the SRZ.

³ (Breloer, 1994), Appendix 2 Terminology

⁴ https://www.treetec.net.au/TPZ_SRZ_DBH_calculator.php for all TPZ and SRZ calculations

- 2.1.5 T10 and T11 are trees that will be retained with building activities taking place outside the TPZs.

3 Conclusions/Recommendations

- 3.1.1 The construction of the proposed swimming pool and deck areas would result in the removal of five trees, 6-10m high, all in poor condition.
- 3.1.2 T1 would experience a 10% encroachment of the SRZ but as it is an approx. 3m high palm tree it would not be destabilised as a result. Palms are more resilient than trees and T1 would be expected to survive the development.
- 3.1.3 The TPZ of T3 would see a minor encroachment of approx. 7%, an acceptable outcome for AS 4970-2009, Protection of trees on development sites.
- 3.2.1 Tree protection measures (Appendix 3) and the tree protection plan below must be adhered to ensuring that the retained trees survive the development in good health and vigour.

4 Tree Protection Plan

- 4.1.1 Apply stem protection to T1, T3.
- 4.1.2 Install tree protection fencing around the perimeters of the two TPZs and following the footprint of the proposal to prevent *Activities restricted within the TPZ⁴* from occurring.
- 4.1.3 Ensure tree protection measures specified in Appendix 4 are complied with throughout the life of the development.
- 4.1.4 Appoint a project arborist with an AQF level 5 qualification to certify that the development complies with construction milestones such as the installation of tree protection measures⁵ before the commencement of building activity.

⁵ Appendix 3, Tree Protection Measures

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Nigel Dean', with a long horizontal stroke extending to the right.

Nigel Dean
Standfast Tree Services Pty Ltd

Works Cited

- AS 4970-2009, Protection of trees on development sites (2009).
- Breloer, C. M. (1994). Field Guide for visual tree assessment (VTA). *Arboriculture Journal*, 18, 1-23.
- Richard W. Harris, J. R. (2004). *Arboriculture, Integrated Management of Landscape Trees, Shrubs and Vines*. Upper Saddle River: Pearson Education Inc.

Table 1, Tree data

#	Genus species	Health	Cond	Height approx m	Spread approx m	DBH approx m	Radius ⁶ TPZ m	DAB approx m	Radius ¹ SRZ m	Comments
T1	<i>Washingtonia robusta</i>	VG	VG	3	1	0.2	2.4	0.35	2.1	Less than 5m high, will most likely be retained
T2	<i>Callitris rhomboidea</i>	G	P	6	4	0.2				Previously top-lopped, within proposed footprint, remove
T3	<i>Callitris rhomboidea</i>	G	P	6	2	0.17	2.0	0.2	1.7	Previously top-lopped, suppressed by adjacent trees with no canopy in the eastern hemisphere, retain
T4	<i>Callitris rhomboidea</i>									More than 5m away from the proposed footprint, not assessed for this AIA, retain
T5	<i>Callitris rhomboidea</i>	G	P	6	4	0.2				Adjacent to trampoline, previously top lopped, within proposed footprint, remove

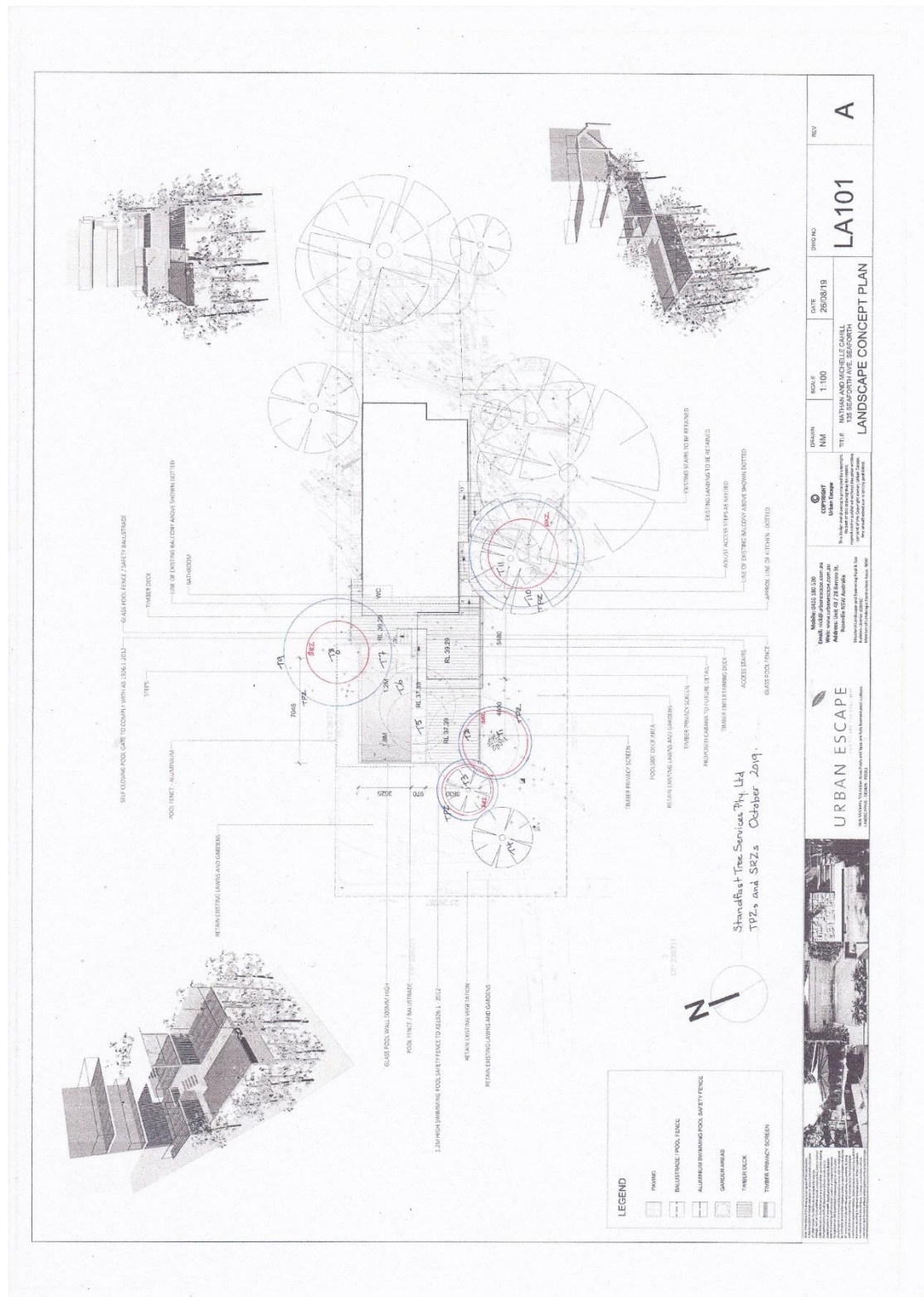
⁶ http://www.treetec.net.au/TPZ_SRZ_DBH_calculator.php

#	Genus species	Health	Cond	Height approx m	Spread approx m	DBH approx m	Radius TPZ m	DAB approx m	Radius SRZ m	
T6	<i>Glochidion ferdinandi</i>	VG	G	8	3	0.18				The other side of trampoline to tree #5. It is within the footprint of the proposed development. Two stems and suppressed by adjacent trees, it has no canopy in the eastern hemisphere, remove
T7	<i>Callitris rhomboidea</i>	G	P	7	0.5	0.1				Poor specimen, approx 7m high and DBH of 0.1m, within new footprint, remove
T8	<i>Glochidion ferdinandi</i>	VG	P	10	6	0.3	3.6	0.35	2.1	Between trampoline and existing deck and scaffold. Incursions of the TPZ (approx. 25%) and SRZ (approx. 9%), previously top-lopped, remove
T9	<i>Eucalyptus</i> spp.									5.3m from proposed development footprint. Positioned in neighbour's property, westerly lean, retain
T10	<i>Glochidion ferdinandi</i>	VG	VG	12	8	0.3	3.6	0.4	2.25	The area within the TPZ taken up with the proposed development consists of solid rock with no disruption of soil/grade. Retain
T11	<i>Olea europaea</i> subsp. <i>cuspidata</i>									Exempt species. The area within the TPZ taken up with the proposed development consists of solid rock with no disruption of soil/grade. Retain



Figure 1, proposed development site

Appendix 1, Tree Protection Plan (drawing)



Appendix 2, Terminology

Age Classes:

Juvenile refers to a well-established but young tree (J).
Semi Mature refers to a tree at growth stages between juvenile and full size (SM).
Mature refers to a full-sized tree with some capacity for further growth (M).
Over Mature refers to a tree about to enter decline or already declining (OM).

Health:

Refers to a tree's vigour and is assessed by looking at crown density, leaf colour, presence of epicormic shoots and degree of dieback. Classes are Very Good (VG) Good (G) Poor (P) Very Poor, declining (VP).

Condition:

The state of the scaffold (trunk and major branches) is assessed. Defects such as cavities, included branches and trunk unions and the fruiting body of a fungus would be indicative of compromised condition. Classes are Very Good (VG) Good (G) Poor (P) Very Poor (VP).

Note: Trees may be found to be in VG health but in VP condition and vice versa

DBH:

Diameter at Breast Height refers to the tree trunk diameter measured at breast height or 1.4 metres above ground level.

DAB:

Diameter Above the Buttress refers to the tree trunk diameter measured above the root buttress and is used to calculate the radius of the SRZ.

VTA:

Visual Tree Assessment⁷ – a systematic inspection usually conducted from ground level looking for defects in a tree. Further investigation would be carried out if necessary by aerial inspection or with specialised equipment to test the extent of a defect and the implications for the tree. A VTA is the accepted starting point and often the end point for assessing trees for defects.

Defect:

Tree defects are injuries, growth patterns, decay, or other conditions that reduce a tree's structural strength. While a defect identifies the point at which a tree may fail or why it may fail it does not mean the tree will fail. Defects should be tested until their full extent is established.

Hazard:

⁷ (Breloer, 1994)

Something that has the potential to cause harm or loss; this does not mean that it will cause harm or is likely to cause harm.

Note: all trees are hazardous.

Risk:

The likelihood of a particular harm or loss occurring (Likelihood x Consequence). Often risk associated with trees is small enough to be ignored or small enough that no reasonable practicable solution exists to reduce risk. Consequence refers to the target that would be affected by tree or branch failure.

TPZ:⁸

Tree Protection Zone The radius of the TPZ is calculated for each tree by multiplying the DBH x 12. To establish the TPZ this radius is measured from the centre of the stem at ground level and it is an area that is to be isolated from construction disturbance. Any encroachment into the TPZ of more than 10% is considered to be a major encroachment.

SRZ:⁹

Structural Root Zone The radius of the SRZ is calculated using the following formula:

$r(SRZ) = (D \times 50)^{0.42} \times 0.64$ where D is the DAB measured in metres. It is the area around a tree that is required for tree stability and is usually applied on construction sites after there has been a major encroachment of the TPZ.

$t/R < 0.30$ ¹⁰

t = width of sound wood, R = radius of the trunk. Regarded as the threshold for action when the ratio of the width of sound wood to the radius of the trunk is less than 0.3 for a cavity or decay in the stem of a tree.

Canker:

A localised area of exposed wood on the trunk or a branch with no bark or cambium caused by invading decay fungi. The bark and cambium does not grow back and the wood can become brittle and the point at which a stem or branch fails⁴.

Crown maintenance:

'Pruning according to the growth habit of the tree. It includes deadwooding, crown thinning, selective pruning and formative pruning....It does not reduce the volume of the crown and retains the structure and size of the tree.' AS 4373-2007, Pruning amenity trees.

⁸ AS 4970-2009, Protection of trees on development sites

⁹ AS 4970-2009, Protection of trees on development sites

¹⁰ (Richard W. Harris, 2004)

Crown modification:

'Pruning that changes the form and habit of the tree. It includes reduction pruning, crown lifting, pollarding and remedial (restorative) pruning.' AS 4373-2007, Pruning amenity trees.

Appendix 3, Tree Protection Measures

Tree Protection Fence (TPF)

The TPZ should be isolated from construction disturbance by a Tree Protection Fence (TPF) around the tree or groups of trees to be retained. Existing structures such as fences or walls can be part of the TPF.

The TPF should be erected before any machinery or materials are brought onto the site and before the commencement of works including demolition.

A TPF complying with AS 4687 would:

- Be constructed of chain wire mesh panels with shade cloth attached (if required) to reduce the transport of dust, other particulate matter and liquids into the protected area.
- Have fence posts and supports with a diameter greater than 20mm.
- Be held in place with concrete feet.
- Be 1.8m high.
- Have signs that are visible from within the development site identifying the TPZ placed around its edge. The lettering on the signs should comply with AS 1319.

Stem and branch protection

The purpose of stem and branch protection is to prevent physical damage being done to the tree from plant and machinery and other construction activities.

Stem and branch protection should consist of boards and padding that will not damage the bark.

Boards should be strapped to trees and not nailed or screwed.

A minimum height of 2m is recommended.

Ground protection

If temporary access for machinery is required within the TPZ ground protection measures will be required.

The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Ground protection measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards.

Root protection during works within the TPZ and SRZ

Some approved works within the TPZ and SRZ have the potential to damage roots. These activities include:

- Regrading
- Installation of piers
- Landscaping

If the grade is to be raised the material should be coarser or more porous than the underlying material. Depth and compaction should be minimised.

Manual excavation should be carried out under the supervision of the project arborist to identify roots critical to tree stability. Relocation or redesign of works may be required.

Roots pruned within the outer edge of the TPZ and SRZ should:

- Have the final cut made to undamaged wood.
- Be pruned with sharp tools such as secateurs, pruners, handsaws or chainsaws.
- Should not be treated with dressings or paint.
- Should not be 'pruned' with machinery such as a backhoe or an excavator.

When roots within the TPZ and SRZ are exposed by excavation temporary root protection should be installed to prevent them from drying out. This may include jute mesh or hessian sheeting as multiple layers over the exposed roots and the excavated soil profile extending to the full depth of the root zone. Root protection sheeting should be pegged in place and kept moist during the period that the root zone is exposed

Other excavation works in proximity to trees, including landscape works such as paving, irrigation and planting can adversely affect root systems.

Installing underground services within the TPZ

All services should be routed outside the TPZ.

If underground services must be routed within the TPZ they should be installed by directional drilling or in manually excavated trenches.

The directional drilling bore should be at least 600mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees.

For manual excavation of trenches the project arborist should advise on roots to be retained and should monitor the works. Manual excavation may include the use of pneumatic and hydraulic tools.

Scaffolding

Scaffolding should be erected outside the TPZ.

Where it is essential for scaffolding to be erected within the TPZ branch removal should be minimised. When pruning is unavoidable it must be specified by the project arborist and comply with AS 4373.

The ground below the scaffolding should be protected with boarding, eg scaffold board or plywood sheeting. Where access is required a board walk or other surface material should be used to minimise soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed.

Activities restricted within the TPZ

1. machine excavation including trenching
2. excavation for silt fencing
3. cultivation
4. storage
5. preparation of chemicals, including preparation of cement products
6. parking of vehicles and plant
7. refuelling
8. dumping of waste
9. wash down and cleaning of equipment
10. placement of fill
11. lighting of fires
12. soil level changes
13. temporary or permanent installation of utilities and signs
14. causing physical damage to the tree.