1 Station Lane

Penrith NSW 2750

Predevelopment Tree

Assessment Report

Prepared for:

Mr. Antoine Saouma

Prepared By:

Nada Kbar

Consulting Arboriculturalist (AQF level 5)

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1.0 Synopsis

The report was commissioned by Mr. Saouma on behalf of Station Lane Pty Ltd ATF the Station Lane Trust, to assess the health, condition, and potential impacts of the proposed development on trees growing on the site of the proposed development 1 Station Lane, Penrith NSW 2750 and to provide recommendations as a part of the process in obtaining a Development Application.

The proposed development is to build a Proposed residential flat building @ Lot B2, DP 161921, No 1 Station Lane Penrith.

The report is aimed at determining trees that may be retained as part of the surrounding landscape in the long term and guiding the design process of the development to comply with the council's development consent conditions. This report is concerned only with health and condition of the subject trees that are located on the site and the potential impacts from the proposed development. It takes no account of root mapping or the invasive structural strength assessment of the trees.

A Visual Tree Assessment (VTA) was conducted from ground level employing techniques developed by Mattheck & Breloer 1994. The trees have been given a unique number for this site as (T1 till T13). (Refer to image 2 & Appendix 1)

The subject site 1 Station Lane, Penrith, NSW 2750 is within the Penrith City Council. It is not noted to be within a "Heritage Conservation Area". Also it is not located in a designated 10/50 vegetation clearing entitlement area"

On the 28th of July and 7 of August 2018, I attended the site 1 Station Lane, Penrith NSW 2750 and inspected the trees. The trees were given a SULE (Safe and Useful Life Expectancy) and Sustainable Retention Index Value (SRIV) rating to determine its retention value in accordance with the landscape significance of the tree. The tree was placed into three categories for retention; High (retain), Moderate (retain if possible) and low or very low (remove). All detailed assessment based on site visit and data will be documented in the appendices.

Recommendations for removal or retention will be based on the proposed works and compatibility of the trees as well as the trees hazard potential or the Rating mentioned above. The report will assess any potential impacts for trees nominated to be retained and attempt to remove or minimize them where possible. Recommended tree protection measures, as set out in the Australian Standard AS4970 Protection of trees on development sites will be nominated as required.

According to DCP 2010/ C2 Management at Penrith City Council; any works related to the tree (prune/remove) should have permission from the council.

The trees are mix of exotic and native Australian species; none of the assessed trees had any special significance in regards to heritage/environment values as indicated in the Penrith Local Environment Plan 2010 (LEP).

The site was neglected; the trees were left unattended for a prolonged period of time allowing of many invasive species to grow. The majority of trees on the subjected site have had lack of maintenance over the past few years. This has resulted in the presence of many structural and major defects amongst the trees. Some trees have been invaded by climbing Cactus (*Epiphyllum hookeri*) and Flame vine (*Pyrostegia venusta*). Regardless of their location from the proposed development, amongst the thirteen trees that have been mentioned on the site plan only 2 trees are to be considered healthy and in a good condition (T1 & T7), all others trees are either dead or declined.

None of the assessed trees have any special significance in regards to heritage as indicated in Penrith Local Environment Plan 2010 (LEP)

All trees on the site were identified for removal based on their situation.

Tree protection Zone (TPZ's) and structural rooting zones (SRZ's) were calculated for each tree in accordance with AS4970-2009 Protection tree of development sites.

General tree protection measures were identified and documented in an effort to preserve the trees and maintain the landscape amenity of the site. Alteration of the proposed development is recommended if it helps in the trees' retention.

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2. Introduction

This report has been commissioned by Mr. Saouma on behalf of Station Lane Pty Ltd ATF the Station Lane Trust to assess the trees, which are growing on the proposed site development (1 Station lane, Penrith NSW 2750), to provide an arboricultural report on the potential impacts on the trees from the proposed development works at the site. The client stated that the trees have been nominated to be inspected in relation to a development application.
The proposed development is to build a Proposed residential flat building containing 17 units over 2 basements car parking) @ Lot B2, DP 161921, No 1 Station Lane Penrith.

The discussed trees within this report appear to be planted as specimen trees. Majority of these trees have been invaded by climbing Cactus (*Epiphyllum hookeri*) and Flame vine (*Pyrostegia venusta*). This has resulted in the presence of many structural and major defects amongst the trees.

Image 1: Aerial view of the site shows its context and location.

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3. Aim

The report is aimed to assess the health condition of existing trees and potential impacts of the proposed development on the trees, also to give advises and recommendations about the trees conditions for its future management, in order to identify individual tree that may be preserved as a sustainable part of landscape in the long term.

4. Methodology:

4.1 Tree assessment

The tree was assessed visually from the ground, no aerial inspections or invasive testing were used. The tree was marked on the Proposed "Detail Survey Lot B2 In DP 161921, has done by John Lowe and Associations Pty Ltd Consulting Land and Engineering Surveyors, on 11/07/2017".

The following tree assessment is based on the international society of arboriculture criteria and the Tree Survey form (Matheny & Clark, 1998), which includes: Botanical & common name, tree identification, dimension, age, condition etc. (Appendix A)

The following data was collected for each tree after Visual Tree Assessment:

The trees were assessed visually from the ground on the 28th of June and 7 of August 2018 by using the method of Visual Tree Assessment (Mattheck & Breloer 1994). All my observations were made from ground level without detailed investigations and I estimated all dimensions unless otherwise indicated. All photographs were taken by myself during the site visit.

- The DBH diameter of the trunk at breast height was measured by using a diameter tape, at 1.4 m above the ground, expressed in centimeters.
- The DAB diameter of the trunk above the buttress was measured at the beginning of the basal part of the trunk by using diameter tape, expressed in meter.
- The heights and crown clearance were measured approximately, expressed by meters.
- Canopy spread was measured approximately along the four compass points (north, east, south and west) from the centre of the trunk of the edge of the drip-line, expressed in metres.
- Health and condition of the foliage, canopy density, signs/symptoms of pests/ diseases and quantity of deadwood>20mm diameter, dieback, stubs from previous pruning, epicormic growth or any signs of stress.
-Structural condition; using visible evidence of bulges, cracks, lean, inclusion, wounds, fractures, cavities, and evidence of structural decay in the branches and stem, also the stability of the tree, soil cracking, exposed roots, excessive lean and root damage.

- The tree's status: considering whether the tree is listed as a heritage tree, or a significant tree under a tree preservation order.
- No aerial inspections were performed at the time of assessment, however aerial inspection may be included as a part of the recommendation of this report.
- Map of site location (Google Sixmaps Photos).
- Soil compaction was tested by forcing a screwdriver into the soil surface, adjacent to the tree (1m distance from the trunk, South West and north east orientation). I stress that my inspection was of preliminary nature and it did not involve any climbing or detailed investigation beyond what was visible from accessible points at ground level.
- Tools: using a diameter tape, compass, Canon Camera, Teflon hammer, binoculars,

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screw driver and recording instruments.

4.3 Tree retention value

4.3.1 Retention value (SRIV):

According to the institute of Australian Consulting Arboriculturists, IACA Publications (2010) 'Sustainable Retention Index Value (SRIV), provides a dual method of objectively rating the viability of urban trees for development sites based on general tree and landscape assessment criteria, and a numeric index for each tree as a tree management tool', represented in a special matrix. (Appendix C)

SRIV is designed to achieve a quick and readily understood value for a tree but does not replace the need for a comprehensive assessment of a tree and as a tool is intended to be used in conjunction with or complementary to a detailed tree assessment. As a management tool the ongoing SRIV© assessment of a tree may indicate its response to remedial works or other modifications to its growing environment over time. (IACA organization)

4.3.2 SULE (Safe & Useful Life Expectancy): The tree was given a Safe and Useful Life expectancy rating (Barell.J, 1996). SULE gives an estimate of the remaining sustainability of a tree in the landscape expressed as arrange of years. SULE has been calculated by estimating the maximum life expectancy (in years) of the tree species, growing in an urban environment in the Sydney basin. The calculated life expectancy has been modified in consideration of the tree's health, vigour, condition and it's sustainability on the site. The estimated SULE rating is located in (Appendix B).

4.3.3 Landscape significance

The landscape significance of each tree has been determined by evaluating the following:

- The amenity value of the tree: considering the live crown size, canopy density, and visual impact in the landscape.
- The environmental values of the tree: considering the identified environmental status of the tree; its botanical importance and its status as an identified habitat tree.
- The heritage values of the tree: considering cultural heritage, obriginal heritage, historical significance and natural heritage status.

4.4 **Determining Tree Retention Value.**

Tree Retention Value Matrix							
	Landscape Significance Rating						
Estimated life expectancy (SULE)	1 Significant	2 Very high	3 High	4 Moderate	5 Low	6 Very low	7 Insignificant
Long > 40 years	High Retention Value						
Medium 15-40 years			Moderate				
Short 5-15 years				Low Ret. Value			
Less than 5 years					Very low Retention Value		
Dead or Hazardous							

Table 1. Source ANDREW MORETON 2006

Weighing up sustainability and landscape significance to arrive at a retention value is the next step in the process. We have seen that these two elements must be assessed independently, since they have a relationship with one another. The health, condition and

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longevity of an item (in this instance a tree) increase or diminish depending on its level of intactness, quality and potential longevity.

4.5 Tree protection zones (TPZ)

According to the standard AS 4970-2009 Protection of trees on development sites, section 3 Determining the Protection Zones of the existing trees, clause 3.2 (Determining the TPZ) "The radius of the TPZ is calculated for each tree by multiplying its DBH * 12, (TPZ = DBH*12), where the DBH= trunk diameter measured at 1.4 m above the ground level."(p.11)

4.6 Structural Root Zone (SRZ)

According to the standard AS 4970-2009 Protection of trees on development sites, clause 3.2.5 Structural root zone (SRZ) "an indicative SRZ. Radius can be determined from the trunk diameter measured immediately above the root buttress using the following formula:

SRZ radius = $(D \times 50)^{0.42} \times 0.64$ "(p. 12).

4.7 Encroachment into TPZ

According to the standard AS 4970-2009 (clause 3.3.2, and 3.3.3), the encroachment into TPZ is less than 10% of the area of the TPZ and is outside the SRZ is called minor encroachment and detailed root investigation should not be required. If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s)would remain viable.
Measurement should be done from the centre of the trunk and expressed in meters. (P.11, 12).

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5. Observations

5.1 The Site visit: I carried out a site visit on the 28 of July and 7 of August 2018. Based on the visits I noticed the following:

All my observations were from ground level without detailed investigations and I estimated all dimensions unless otherwise indicated.

All trees are located on the subject site. Although the trees (T1 & T7) are healthy, they should be removed alongside the other 11 unhealthy trees, as they are impacted by the proposed development.

The trees have been located on the supplied Proposed Detail and Level Survey plan and numbered. This plan is for illustrative purposes only and it should not be used for directly scaling measurement. Refer (Image 2).

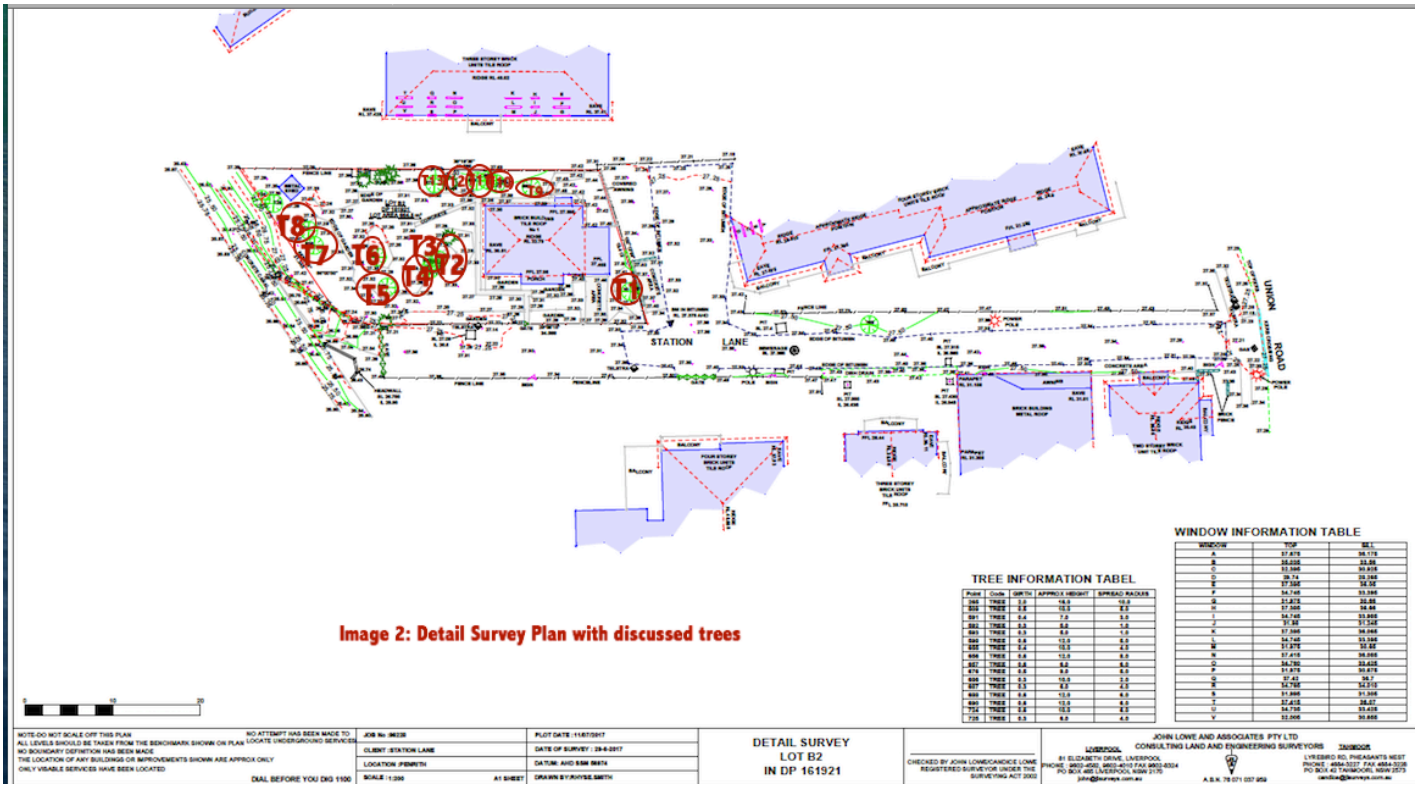

Image 2: Detail Survey Plan with discussed trees

-The site 1 Station Lane is rectangular by shape and located in the residential suburb of Penrith NSW 2750, within the Penrith City Council.

Property number “1” is on the west side of station lane, surrounded by similar residential developments. Pedestrian & vehicle entry is via only Station Lane; it is currently occupied by a single dwelling. The proposed site and the surrounding area‘s topography are flat.

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5.2 Summary of results:

(Key words Appendix A)

Tree no. 1

- Botanical Name**: Brachychiton acerifolius**
- Common Name: **Illawarra Flame Tree**
- Location**: OS**
- DBH (cm): **45**
- DAB (m): **0.5**
- Canopy spreading (m):
  (**N, S): 7 (E, W): 8**
- Height (m): **10**
- Canopy density (%): **90**
- Type (N, R, E, P, S, Nox): **N**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **D**
- Crown condition (0-5**): 4**
- Root Zone: **Ga**
- Defect**: EP**
- Service/ Adjacent Structures: **F**
- SULE: Safe Useful Life Expectancy rating:
  Short: 3b
- TPZ (Tree Protection Zone) (R): **5.4m**
- SRZ (Structural Root Zone) (R): **2.5m**

Image 3: shows the location of T1 on the front yard of the site.

Tree no. 2

- Botanical Name: ***Syagrus romanzoffianum***
- Common Name: **Cocos Palm**
- Location: **OS**
- DBH (cm): **29**
- DAB (m): **0.38**
- Canopy spreading (m):
  (**N, S): 3 (E, W): 3**
- Height (m): **11**
- Canopy density (%): **80**
- Type (N, R, E, P, S, Nox): **E**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **D**
- Crown condition (0-5): **4**
- Root Zone: **Ga**
- Defect: **dead wood**
- Service/ Adjacent Structures**: N/A**
- SULE: Safe Useful Life Expectancy rating: **Short 3C**
- TPZ (Tree Protection Zone) (R): **3.6m**
- SRZ (Structural Root Zone) (R): **2.2m**

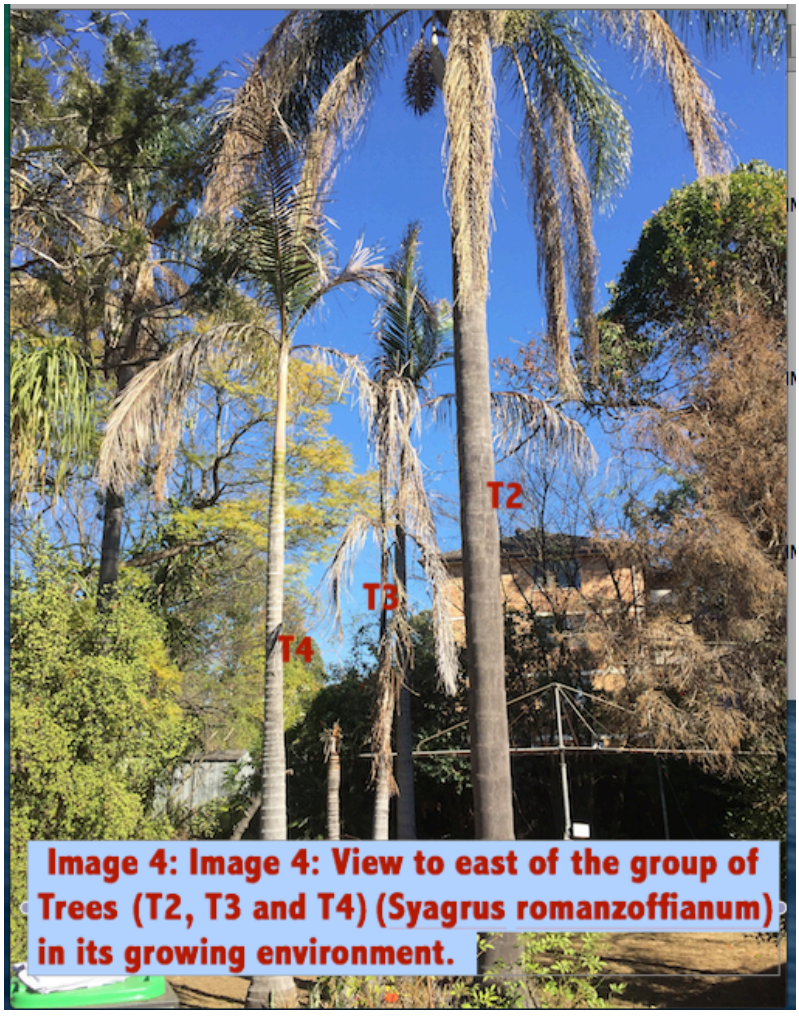

Image 4: Image 4: View to east of the group of Trees (T2, T3 and T4) (Syagrus romanzoffianum) in its growing environment.

Tree no. 3

- Botanical Name: ***Syagrus romanzoffianum***
- Common Name: **Cocos Palm**
- Location: **OS**
- DBH (cm): **16**
- DAB (m): **0.22**
- Canopy spreading (m):
  (**N, S): 1 (E, W): 1**
- Height (m): **4**
- Canopy density (%): **20**
- Type (N, R, E, P, S, Nox): **E**
- Age Class (Y/S/M/O): **Y**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **2**
- Root Zone: **Ga**
- Defect: **dead wood**
- Service/ Adjacent Structures**: N/A**
- SULE: Safe Useful Life Expectancy rating: **Remove 4a**
  Dead, dying, suppressed or declining trees
- TPZ (Tree Protection Zone) (R): **2m**
- SRZ (Structural Root Zone) (R): **1.75m**

Tree no. 4

- Botanical Name: ***Syagrus romanzoffianum***
- Common Name: **Cocos Palm**
- Location: **OS**
- DBH (cm): **19**
- DAB (m): **0.25**
- Canopy spreading (m):
  (**N, S): 1 (E, W): 1**
- Height (m): **5**
- Canopy density (%): **50**
- Type (N, R, E, P, S, Nox): **E**
- Age Class (Y/S/M/O): **Y**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **2**
- Root Zone: **Ga**
- Defect: **DW, W & DL**
- Service/ Adjacent Structures**: N/A**
- SULE: Safe Useful Life Expectancy rating: **Short 3c**
- TPZ (Tree Protection Zone) (R): **2.8m**
- SRZ (Structural Root Zone) (R): **1.8m**

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Tree no. 5

- Botanical Name: ***Cupressus sempervirens***
- Common Name: **Mediterranean Cypress**
- Location: **OS**
- DBH (cm): 54
- DAB (m): 0.63
- Canopy spreading (m):
  (**N, S): 4 (E, W): 3**
- Height (m): **10**
- Canopy density (%): **<30**
- Type (N, R, E, P, S, Nox): **E**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **2**
- Root Zone: **Ga**
- Defect: **DW, W, S & D**
- Service/ Adjacent Structures: **none**
- SULE: Safe Useful Life Expectancy rating: **Remove 4c**

- TPZ (Tree Protection Zone) (R): **6.5m**
- SRZ (Structural Root Zone) (R): **2.7m**

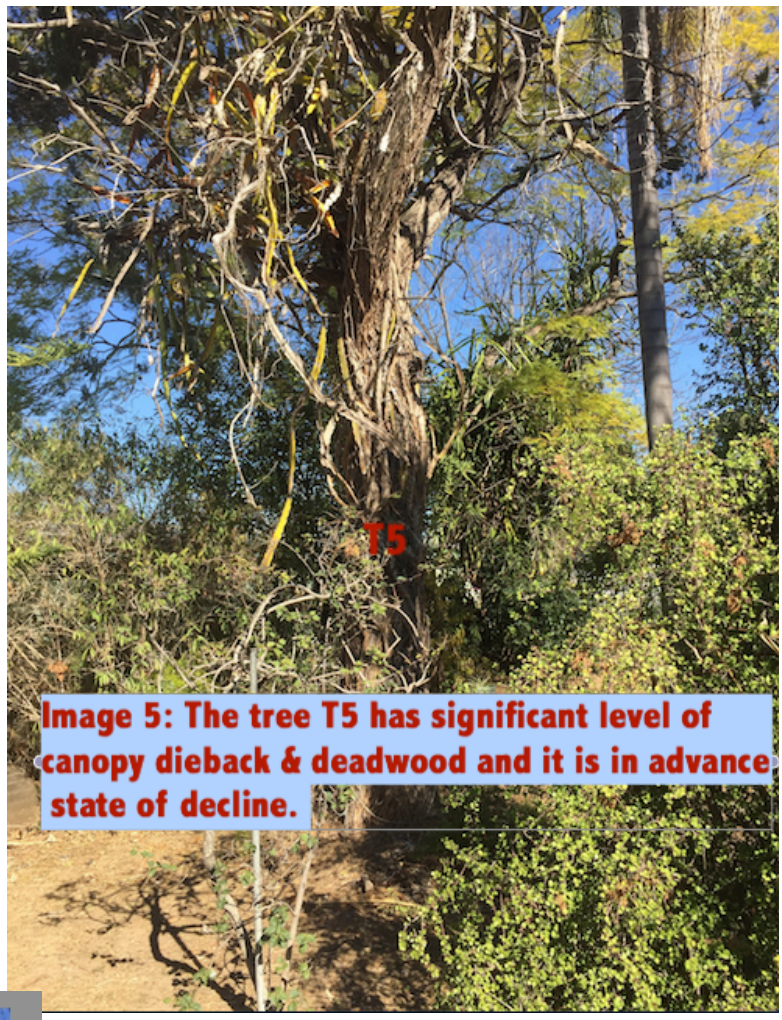

Image 5: The tree T5 has significant level of canopy dieback & deadwood and it is in advance state of decline.

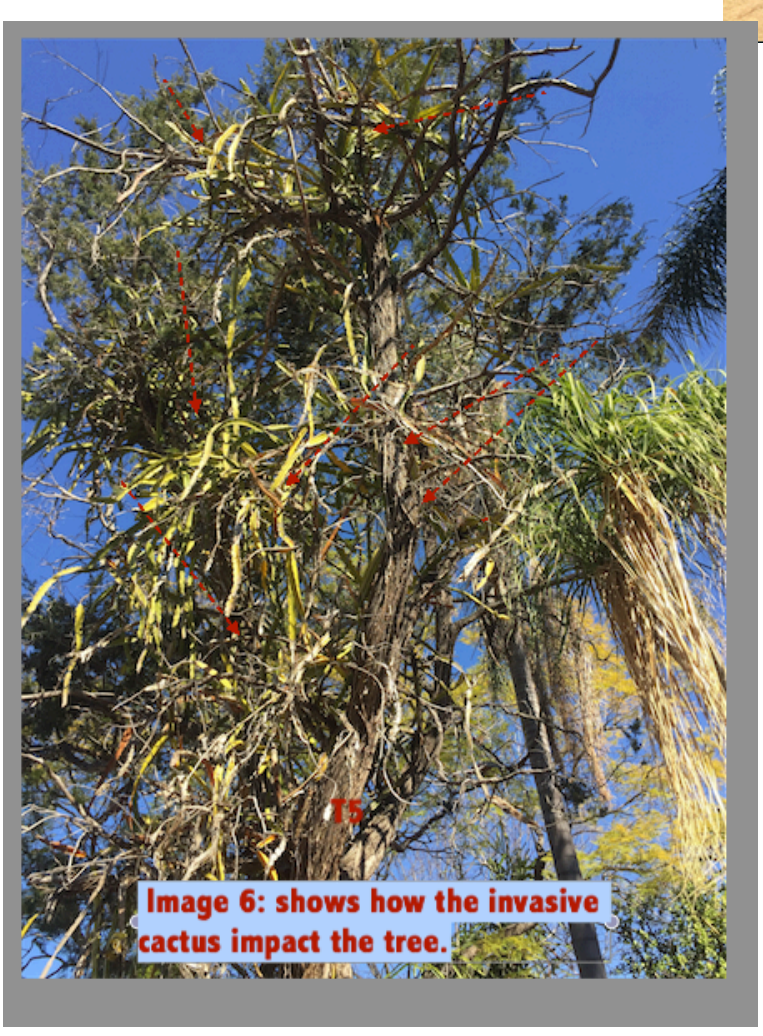

Image 6: shows how the invasive cactus impact the tree.

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Tree no. 6

- Botanical Name: ***Syagrus romanzoffianum***
- Common Name: **Cocos Palm**
- Location: **OS**
- DBH (cm): **19**
- DAB (m): **0.28**
- Canopy spreading (m):
  (**N, S): 2 (E, W): 2**
- Height (m): **9**
- Canopy density (%): **80**
- Type (N, R, E, P, S, Nox): **E**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **D**
- Crown condition (0-5): **4**
- Root Zone: **Ga**
- Defect: **dead wood**
- Service/ Adjacent Structures**: F**
- SULE: Safe Useful Life Expectancy rating: **Short 3C**
- TPZ (Tree Protection Zone) (R): **2.3m**
- SRZ (Structural Root Zone) (R): **1.9m**

Image 7: Tree T6 (CoCos Palm) is an exmpt tree from the council Tree Preservation order.

Tree no. 7

- Botanical Name: ***Jacaranda mimosifolia***
- Common Name: **Jacaranda**
- Location: **OS**
- DBH (cm): **47**
- DAB (m): **0.54**
- Canopy spreading (m):
  (**N, S): 6 (E, W): 9**
- Height (m): **9**
- Canopy density (%): **75**
- Type (N, R, E, P, S, Nox): **E**
- Age Class (Y/S/M/O): M
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **3**
- Root Zone: **Ga**
- Defect: **DW**
- Service/ Adjacent Structures: **F**
- SULE: Safe Useful Life Expectancy rating: **Short 3b**
- TPZ (Tree Protection Zone) (R): **5.6m**
- SRZ (Structural Root Zone) (R): **2.6m**

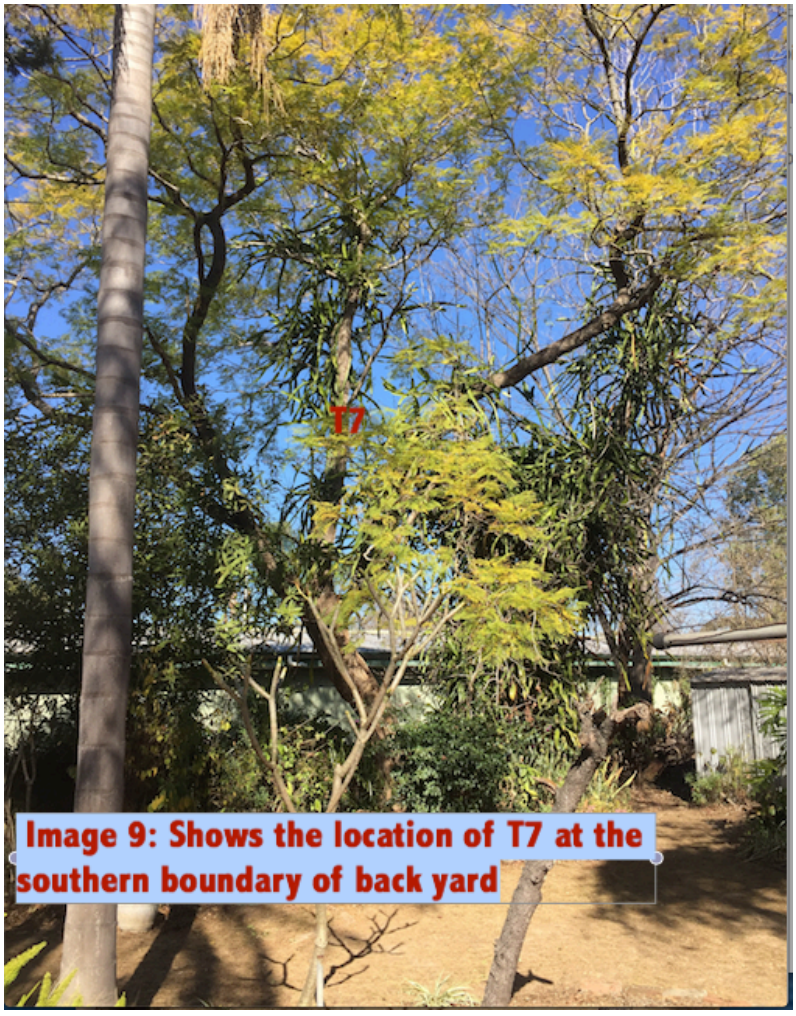

Image 9: Shows the location of T7 at the southern boundary of back yard

Image10 : Also tree T7 was invaded by the cactus weed

Image 11: View to north of the Trees:
T6 (Syagrus romanzoffianum), T7 (Jacaranda mimosifolia) and T8 (Liquidambar styraciflua) in their growing environment.

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Tree no. 8

- Botanical Name: ***Liquidambar styraciflua***
- Common Name: **American Sweet Gum**
- Location: **OS**
- DBH (cm): 41
- DAB (m): 0.43
- Canopy spreading (m):
  (**N, S): 4 (E, W): 2**
- Height (m): **7**
- Canopy density (%): **10**
- Type (N, R, E, P, S, Nox): **E**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **2**
- Root Zone: **Ga**
- Defect: **DW & DL**
- Service/ Adjacent Structures: **F**
- SULE: Safe Useful Life Expectancy rating: **Remove 4c**
- TPZ (Tree Protection Zone) (R): **4.9m**
- SRZ (Structural Root Zone) (R): **2.3m**

Image 12: shows that Tree T8 is significantly declined due to the invasive cactus

Tree no. 9

- Botanical Name**: Brachychiton discolor**
- Common Name: **Sycamore**
- Location**: OS**
- DBH (cm): **60**
- DAB (m): **0.75**
- Canopy spreading (m):
  (**N, S): 3 (E, W): 4**
- Height (m): **15**
- Canopy density (%): **<10**
- Type (N, R, E, P, S, Nox): **N**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **1**
- Root Zone: **Ga**
- Defect: **DL**
- Service/ Adjacent Structures: **F, H**
- SULE: Safe Useful Life Expectancy rating: **Remove 4c**
  Dangerous trees because of structural defects
- TPZ (Tree Protection Zone) (R): **7.2m**
- SRZ (Structural Root Zone) (R): **2.9m**

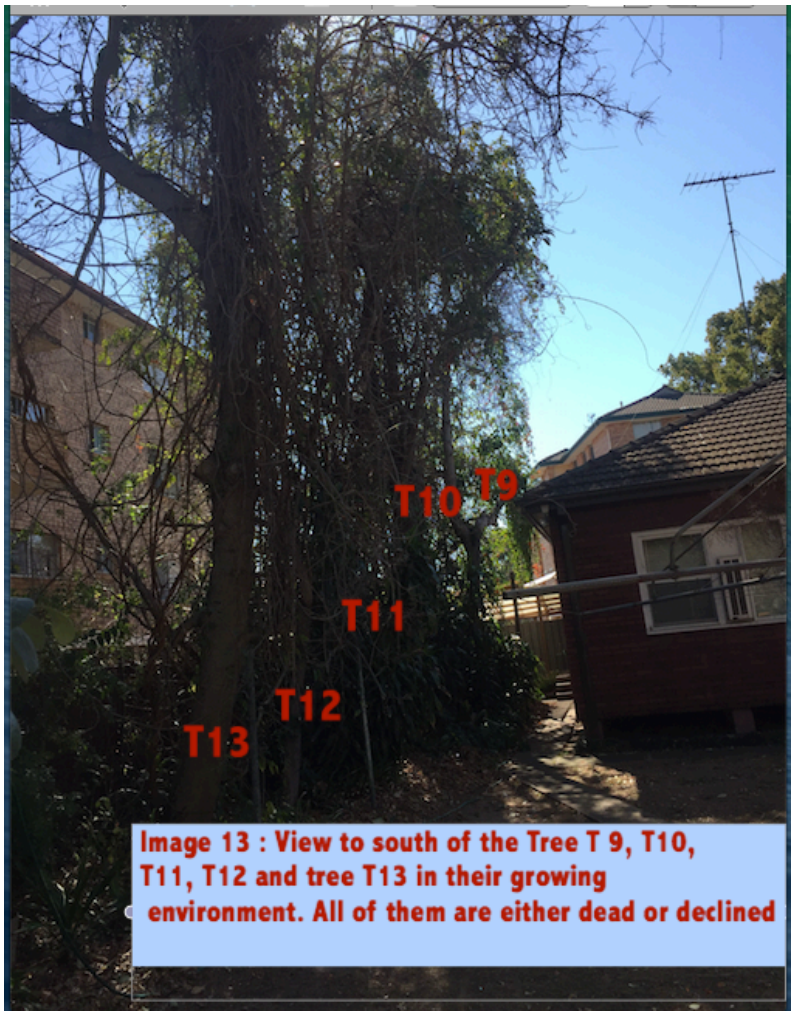

Image 13 : View to south of the Tree T 9, T10, T11, T12 and tree T13 in their growing environment. All of them are either dead or declined

Tree no. 10

- Botanical Name**: Brachychiton discolor**
- Common Name: **Sycamore**
- Location**: OS**
- DBH (cm): **80**
- DAB (m): **0.90**
- Canopy spreading (m):
  (**N, S): 3 (E, W): 4**
- Height (m): **15**
- Canopy density (%): **<10**
- Type (N, R, E, P, S, Nox): **N**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **1**
- Root Zone: **Ga**
- Defect: **DL**
- Service/ Adjacent Structures: **F, H**
- SULE: Safe Useful Life Expectancy rating: **Remove 4c**
  Dangerous trees because of structural defects
- TPZ (Tree Protection Zone) (R): **9.6m**
- SRZ (Structural Root Zone) (R): **3.2m**

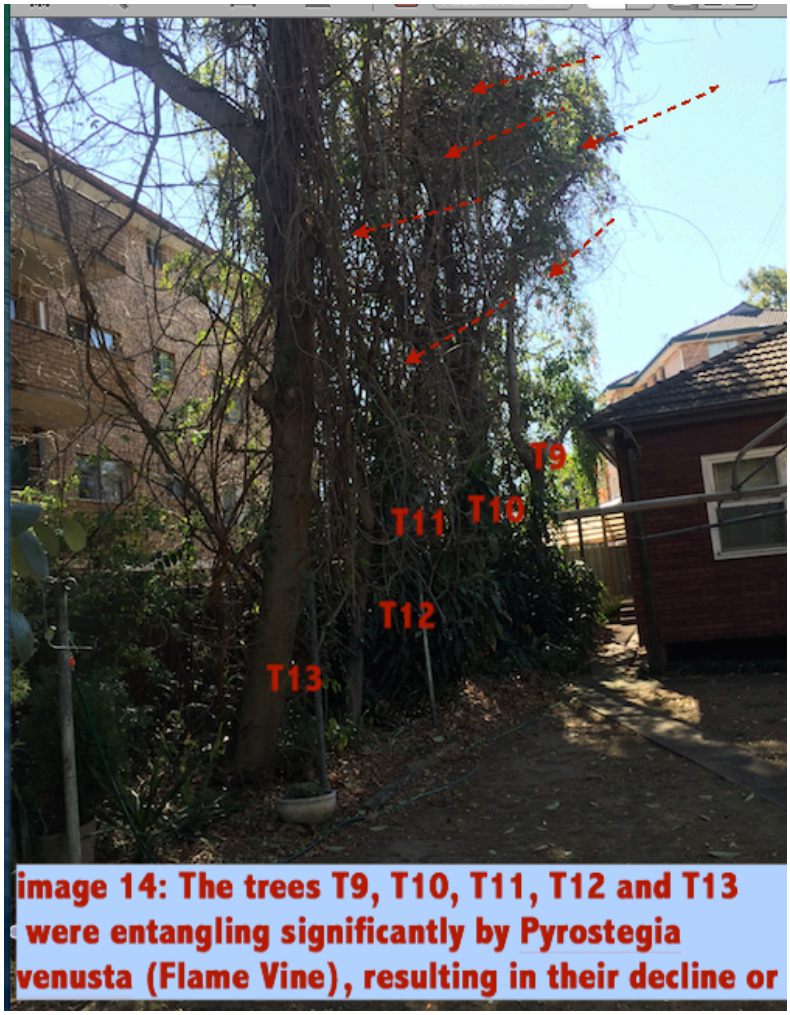

image 14: The trees T9, T10, T11, T12 and T13 were entangling significantly by Pyrostegia venusta (Flame Vine), resulting in their decline or

Tree no. 11

- Botanical Name**: Standing dead tree**
- Common Name:
- Location**: OS**
- DBH (cm): **40**
- DAB (m): **0.50**
- Canopy spreading (m):
  (**N, S): 1 (E, W): 2**
- Height (m): **5**
- Canopy density (%): **dead**
- Type (N, R, E, P, S, Nox):
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **0**
- Root Zone: **Ga**
- Defect: **Dead**
- Service/ Adjacent Structures: **F, H**
- SULE: Safe Useful Life Expectancy rating: **Remove 4a**
  Dead, dying, suppressed or declining trees.
- TPZ (Tree Protection Zone) (R): **4.8 m**
- SRZ (Structural Root Zone) (R): **2.5m**

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Tree no. 12

- Botanical Name**: Brachychiton discolor**
- Common Name: **Sycamore**
- Location**: OS**
- DBH (cm): **50**
- DAB (m): **0.60**
- Canopy spreading (m):
  (**N, S): 3 (E, W): 2**
- Height (m): **8**
- Canopy density (%): **<10**
- Type (N, R, E, P, S, Nox): **N**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **1**
- Root Zone: **Ga**
- Defect: **DL**
- Service/ Adjacent Structures: **F, H**
- SULE: Safe Useful Life Expectancy rating: **Remove 4c**
  Dangerous trees because of structural defects
- TPZ (Tree Protection Zone) (R): **m**
- SRZ (Structural Root Zone) (R): **3.2m**

Tree no. 13

- Botanical Name**: Brachychiton discolor**
- Common Name: **Sycamore**
- Location**: OS**
- DBH (cm): **60**
- DAB (m): **0.70**
- Canopy spreading (m):
  (**N, S): 3 (E, W): 5**
- Height (m): **8**
- Canopy density (%): **<10**
- Type (N, R, E, P, S, Nox): **N**
- Age Class (Y/S/M/O): **M**
- Crown class (D/C/I/S): **S**
- Crown condition (0-5): **1**
- Root Zone: **Ga**
- Defect: **DL**
- Service/ Adjacent Structures: **F, H**
- SULE: Safe Useful Life Expectancy rating: **Remove 4c**
  Dangerous trees because of structural defects
- TPZ (Tree Protection Zone) (R): **7.2m**
- SRZ (Structural Root Zone) (R): **2.8m**

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- 5.2 Acknowledgements: - Detail Survey plan, Lower basement plan, upper basement plan Ground Floor plan, Level 1 , Level 2 Plan, Level 3 Plan, Level 4, Level 5 Plan and Roof plan.

- 6.0 Discussion

- Tree T1: *Brachychiton acerifolius*

It is a mature specimen of an Australian native species (**Illawarra Flame Tree**). Which is located upon the front boundary of the subject property, erected with single-trunk at 10 metres tall. It showed good health and vitality with minor epicormic growth through the canopy. (Refer image:3)

- Construction impact on T1

Tree T1 is located within the footprint of the proposed development. The proposed development is not only estimated to be within the Tree Protection Zone for the tree T1, but it will also exceed the major encroachment and will breach the T1's SRZ. Thus T1 will be definitely influenced by the development. According to Matheny & Clark 'there are two considerations in evaluating root disturbance: removal of absorbing roots and removal of support or anchoring roots. Removing shallow absorbing roots can cause immediate water stress. The ability of the tree to survive that impact is linked to its tolerance of water stress and ability to form new roots rapidly' (1998). (Refer table 2).

This tree will need to be removed to allow the works to proceed, as it is a constraint to the work in its position. The tree should be replaced with a more suitable specimen in an appropriate location in the new landscape plan. (Refer table 2)

-**The SULE rating** of T1 is (Short SULE) category under: "3 (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.". (Ref. Appendix B)

-**The SRIV's category** is: "MGVP – 6 "Retention potential - Short Term. Potential for longer with improved growing conditions." (Ref. Appendix C)

-Trees (T2, T3, T4 and T6): Group of *Syagrus romanzoffianum* (Cocos Palm); Regardless of the proposed development, this group of trees are exempt from the Tree Preservation Order, Council consent is not required to remove or prune these trees. (Refer images: 4, 7 & 11)

- Construction impact on group (T2, T3, T4 and T6):

They are located within the footprint of the proposed development. These trees will need to be removed and should be replaced with more suitable specimen in an appropriate location in the new landscape plan (Refer table 2).

-**The SULE rating** of this group is: Remove; "4(e) 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."(Ref. Appendix B)

- The SRIV's category is: "MLVP – 2 for T2 & T3 "Retention potential - Likely to be removed immediately or retained for Short Term."

- The SRIV's category is YLVP -2 for T3 & T4 "Retention potential - Likely to be removed immediately or retained for Short Term" (Ref. Appendix C).

- Tree T5: is a mature exotic ***Cupressus sempervirens*** "**Mediterranean Cypress**" Which is located upon the backyard boundary of the subject property, erected with single-trunk at 10 metres tall. It showed poor health and vitality with excessive deadwood through the canopy. Also it showed severe invasion by Climbing Cactus *(Epiphyllum hookeri)* (Refer images: 5 & 6). The trunk was entangled by this cactus wildly climbing up tree trunk and

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reaching out into the canopy. The tree is significantly declined and in a very poor health condition.

- Construction impact on T5:

This tree is located within the footprint of the proposed development. As it is in the position of the proposed works, which makes tree T5 incompatible for retention due to the impact associated with the development works. (Refer Table 2)

This tree has been nominated for removal and it should be replaced with more suitable specimen in an appropriate location in the new landscape plan.

- **The SULE rating of T5** is: "**Remove 4c** " Dangerous trees because of structural defects". (Ref. Appendix B)

-**The SRIV's** category is: "MLVP – 2 "Retention potential - Likely to be removed immediately or retained for Short Term." (Ref. Appendix C)

- Tree T7: *Jacaranda mimosifolia*

It is a mature specimen of an exotic species (**Jacaranda**). Which is located to the southern west boundary of the proposed works site, erected with single-trunk at 9 metres tall. It showed fair vitality condition. The tree has been invaded severely by *(Epiphyllum hookeri)* up into the canopy. (Refer images: 9, 10 & 11)

- Construction impact on T7

The proposed works are inside of the tree Structural Root Zone. The tree proposed works impact upon approximately 80% of the projected SRZ. This level of disturbance makes the retention of this tree impossible. (Refer table 2).

This tree proposed to be removed and it should be replaced with a more suitable specimen in an appropriate location in the new landscape plan.

- The SULE rating of T7 is (Short SULE) category under: "3 (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.". (Ref. Appendix B)

- The SRIV's category is: "MGVP – 6 "Retention potential - Short Term. Potential for longer with improved growing conditions." (Ref. Appendix C

- Tree T8: *Liquidambar styraciflua*

It is a mature specimen of an exotic species (**American Sweet Gum**). Which is located to the southern west boundary of the proposed works site, erected with single-trunk at 7 metres tall. The tree has been invaded severely by *(Epiphyllum hookeri)* up into the canopy. The tree has varying signs of significant decline, from excessive tip dieback, deadwood, epicormic growth. (Refer images: 11 & 12)

Decline is a general loss of vitality over entire tree either caused by a systemic disease or by a series of events that disrupt essential life processes: too little or too much water, too little soil oxygen etc. (Shigo1986).

- Construction impact on T8

The proposed works are inside of the tree Structural Root Zone. The proposed development is estimated to be within the major encroachment into T8's TPZ, and exceed 75% of the SRZ encroachment. As a result the development will have the potential to negatively impact on the root plate of this tree and cause additional stress to what it is already subjected to.. (Refer table 2).

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This tree has been nominated for removal; tree should be replaced with a more suitable specimen in an appropriate location in the new landscape plan.

- **The SULE** rating of T8 is: "**Remove 4c**: Dangerous trees because of structural defects". (Ref. Appendix B)

- The SRIV's category is: "MLVP – 2 "Retention potential - Likely to be removed immediately or retained for Short Term." (Ref. Appendix C)

-Trees (T9, T10, T11, T12 and T13): Group of **Sycamore** trees are located to the western boundary of the site, they are very close to the existing house. They either dead or declined and they were nominated to be removed. All of them have been invaded severely by *(Pyrostegia venusta:* Flame vine) up into the canopy. This resulted in varying signs of significant decline, from excessive tip dieback, deadwood, epicormic growth and death of others. Refer images: 13 & 14)

- Construction impact on (T9, T10, T11, T12 and T13)

This group of trees has good clearance of the Proposed works and the works are outside of the trees 'Structural Root Zone. However, the development has the potential to negatively impact on the root plate of Trees' projected Tree Protection Zone and cause additional stress to what they are already subjected to.

These trees have been nominated for removal and they should be replaced with more suitable specimen in an appropriate location in the new landscape plan. (Refer Table.2)

-The SULE rating of this group of trees (T9, T10, T11, T12 and T13**)** is: **Remove 4c**: Dangerous trees because of structural defects". (Ref. Appendix B)

-The SRIV's category is: "MLVP – 2 "Retention potential - Likely to be removed immediately or retained for Short Term." (Ref. Appendix C)

- 6.1 Table 2: Trees' rates: (Refer Table 1, Appendix B, Appendix C)

Tree no.	Botanical name	SULE RATE (appendix B)	SRIV Rate (Appendix C)	Landscape Significance Rating (Ref. Table 1)	Tree Retention Value Matrix (Ref. Table 1)	Proposed status
T1	***Brachychiton acerifolius***	Short 3b	MGVP-6	3 High	Moderate	Remove/ within the footprint
T2, T3, T4 & T6	***Syagrus romanzoffianum***	Remove 4e	MlVP-2 (T2 & T6) YLVP-2 (T2 & T6)	7 Insignificant	Very low retention value	Remove
T5	***Cupressus sempervirens***	Remove 4c	MLVP-2	5 low	Low retention value	Remove
T7	***Jacaranda mimosifolia***	Short 3b	MGVP-6	3 High	Moderate retention value	Remove/ within the footprint
T8	***Liquidambar styraciflua***	Remove 4c	MLVP-2	7 Insignificant	Very low retention value	Remove
T9, T10, T11, T12 & T13	***Brachychiton discolor***	Remove 4c	MLVP-2	7 Insignificant	Very low retention value	Remove

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7.0 Recommendation/ Tree management

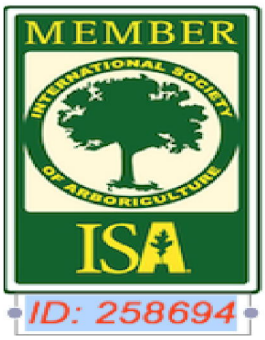
After reviewing the site and the information provided by the client it is my recommendation that the works proceed with the following recommendations

All trees on the subjected site have been nominated for removal and should be replaced in the new landscaping plan.

[redacted]

Date: 15/ 8/2018

Nada kbar
Consulting Arboriculture (AQF Level 5)
0488-837-399 nadakbar10@gmail.com
Registered Consulting Member
Arboriculture Australia



8.0. References:

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http://www.iaca.org.au/home/index.php/publications/73-sustainable-retention-index-value-srivau(SRIV)

9.0 Disclaimer

- Limitations on the use of this report

This report is to be utilised in its entirety only. Any written or verbal submission, report or presentation that includes statements taken from the findings, discussions, conclusions or recommendations made in this report, may only be used where the whole of the original report (or a copy) is referenced in, and directly attached to that submission, report or presentation.

Any further consultation regarding this report and/or the subject tree may incur additional fees, unless prior arrangements made and/or payments received

- Assumptions

Care has been taken to obtain information from reliable resources. All data has been verified insofar as possible; however NOUR_Co can neither guarantee nor be responsible for the accuracy of information provided by others.

Unless stated otherwise:

Information contained in this report covers only the tree that was examined and reflects the condition of that tree at the time of inspection: and the inspection was limited to visual examination of the subject tree without dissection, excavation, probing, coring, or climbing. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the subject tree will not worsen in the future.

10.0 Qualification:

-Diploma of Arboriculture (AQF Level 5) Padstow TAFE, Padstow 2211, NSW.

- Horticulture Cert III, Padstow TAFE, Padstow 2211, NSW.

- Accredited member of Consulting Arboriculturist of Arboriculture Australia under # 3702

- Accredited member of International Society of Arboricutlure ISA under number # 258694.

-Engineering Technologist. Engineers Australia Sydney Division, under # 2428887, June 2006.

-Graduate Diploma in Adult Literacy and Numeracy Teaching, University of Technology, Sydney (UTS), Broadway, Ultimo, NSW.2012-2014

-Diploma of Project Management, MCI (Management Consultancy International Pty Ltd), NSW 2012.

-Master degree of Agriculture engineering from overseas (Lebanese university 1990-1995.

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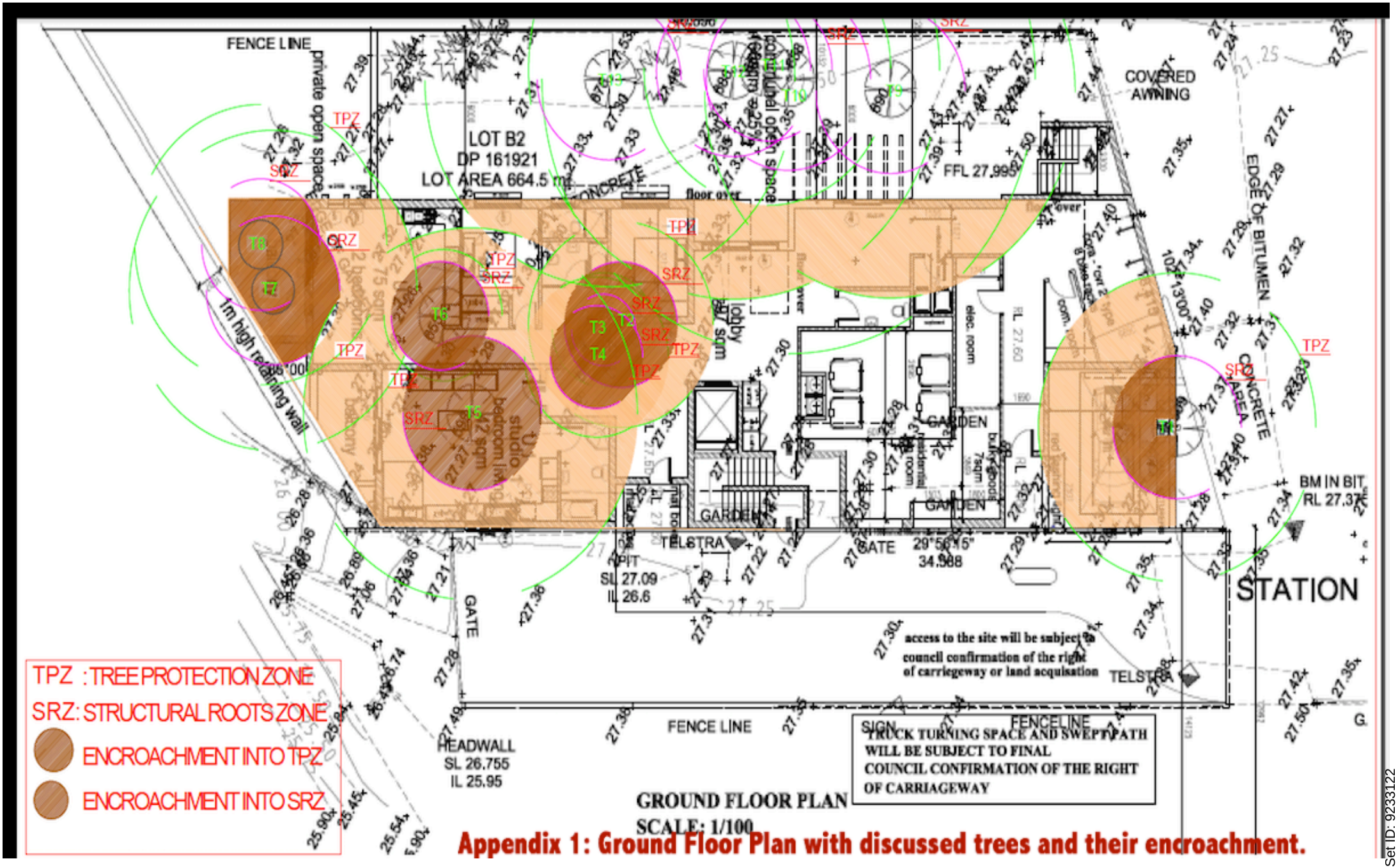

Appendix 1: Ground Floor Plan with discussed trees and their encroachment.

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Appendix A: Tree Schedule

Tree Schedule Definitions (Matheny & Clark, 1998) modified

Location:	**NS** Nature strip	**OS** On Site	**AP** Adjoining Property
DBH:	Diametre at breast height (1.3m)		
Canopy:	North / South x East / West		
Type:	Native, Remnant, Endemic, Planted, Seeded, Noxious weed		
Age Class:	**Y** Young- recently planted	**S** Semi mature- <20% of life expectancy	
	M Mature- 20-80% of life expectancy	**O** Over mature- >80% of life expectancy	
Crown Class:	**D** Dominant crown extends above general canopy; not restricted by other trees.		
	C Co-dominant crown forms the bulk of the general canopy but crowded by other trees.		
	I Intermediate crown extends into dominant/ co dominant canopy but quite crowded on all sides.		
	S Suppressed crown development restricted from overgrowing trees.		
Crown Condition:	Overall vigour and vitality		
	0 Dead		
	1 Severe decline (<20% canopy density; major dead wood)		
	2 Declining (20-60% canopy density; twig and branch dieback)		
	3 Average / low vigour (60-90% canopy density; twig dieback)		
	4 Good (90-100% canopy density; little or no dieback or other problems)		
	5 Excellent (100% canopy density; no deadwood or other problems)		
Root Zone:	**Cmp** Compaction	**D** Damaged / wounded roots	**ER** Exposed roots
	Ga Tree in garden bed	**Gi** Girdled roots	**Gr** Grass
	K Kerb close to tree	**L+** Raised soil level	**M** Mulched
	LP Lifting Pavement	**L-** Lowered soil level	**Pa** Paving etc
Wildlife:	**S** Scats	**M** Markings	**N** Nests
Services / Adjacent structures:		**H** House	**F** Fence
		G Garage	**PL** Power lines
Defects:	**A** Ants	**B** Borers	**BI** Basal Inclusion
	BW Basal Wound	**C** Cavity	**D** Decay
	DL Decline	**DW** Deadwood	**EP** Epicormic Growth
	F Fruiting bodies	**HW** Hardware (nails, wire)	**I** Inclusions
	K Kino	**L** Lean	**LP** Lopped
	MA Multiple Attachments	**MT** Multi trunks	**PF** Previous failures
	S Sap	**SB** Splits/ Cracks	**SCI** Scaffold Inclusion
	T Termites	**TW** Trunk Wound	**TI** Trunk Inclusion
		W Wound	

Failure Potential:* Identifies the most likely failure and rates the likelihood that the structural defect(s) will result in failure within the inspection period.

1 Low – defects are minor (eg dieback of twigs, small wounds with good wound wood development).

2 Medium - defects are present and obvious (eg cavity encompassing 10-25% of the circumference of the trunk)

3 High – numerous and or significant defects (eg cavity encompassing 30-50% of the circumference of the trunk, major bark inclusions).

4 Severe – defects are very severe (eg. heart rot fruiting bodies, cavity encompassing more than 50% of the tree

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Appendix B (Barrell, J. 1996)

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.

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Appendix C

Sustainable Retention Index Value (SRIV)©

SRIV© provides a dual method of objectively rating the viability of urban trees for development sites based on general tree and landscape assessment criteria, and a numeric index for each tree as a tree management tool. SRIV© is designed as an objective system based on set criteria to replace previous subjective systems. SRIV© is based on the principle of sustaining trees in the urban environment including remnant forest trees, but does not cover social aspects of trees, or hedges. Dead trees and environmental or noxious weed species are not considered as removal of these trees is generally encouraged.

SRIV© benefits the arboriculturist by defining each variable providing certainty and clarity to their meaning and by issuing a definite index value to each category. This enables the professional manager of urban trees with an assumed knowledge of the taxa and its growing environment to consider the tree *in situ* and is based on the physical attributes of the tree and its response to its environment. SRIV© considers its *age class*, *condition class*, *vigour class* and its sustainable retention with regard to the safety of people or damage to property. The ability to retain the tree with remedial work, or beneficial modifications to its growing environment or options for removal and replacement.

To promote tree retention, remediation works to improve the growing environment should always be attempted where ever possible. Successive assessments may document improvements in a tree where it responded favorably to remediation, or where conditions in its growing environment improved naturally, or conversely a decline, or a static rating if the tree deteriorated, or no change observed, respectively.

SRIV© is designed to achieve a quick and readily understood value for a tree but does not replace the need for a comprehensive assessment of a tree and as a tool is intended to be used in conjunction with or complementary to a detailed tree assessment. As a management tool the ongoing SRIV© assessment of a tree may indicate its response to remedial works or other modifications to its growing environment over time.

SRIV© is a realistic approach to managing trees but recognises from the outset that as tree taxa are a vast and varied array of organisms, not all will fit easily into the system, e.g. tree species with a lifespan shorter than twenty years, most *Acacia species*. Field trials have revealed that it is suitable for the majority of trees. An example of a SRIV© for a Mature tree with Good Vigour and Poor Condition is an assessment value of MGVP – 6, with 6 as the index value, see page 4. The matrix provides indices as a tree management decision making tool and the Age / Vigour / Condition classes as a tree assessment system.

The Glossary details the definitions for terms to be used with the SRIV© system and are taken from the Institute of Australian Consulting Arboriculturists (IACA)© Dictionary for Managing Trees in Urban Environments[1].

[1] Draper BD and Richards PA 2009, *Dictionary for Managing Trees in Urban Environments*, Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia

Age class	Vigour Class and Condition Class					
	Good Vigour & Good Condition (GVG)	Good Vigour & Fair Condition (GVF)	Good Vigour & Poor Condition (GVP)	Low Vigour & Good Condition (LVG)	Low Vigour & Fair Condition (LVF)	Low Vigour & Poor Condition (LVP)
	Able to be retained if sufficient space available above and below ground for future growth. No remedial work or improvement to growing environment required. May be subject to high vigour. Retention potential - Medium – Long Term.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work may be required or improvement to growing environment may assist. Retention potential - Medium Term. Potential for longer with remediation or favourable environmental conditions.	Able to be retained if sufficient space available above and below ground for future growth. Remedial work unlikely to assist condition, improvement to growing environment may assist. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. No remedial work required, but improvement to growing environment may assist vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	May be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment may assist condition and vigour. Retention potential - Short Term. Potential for longer with remediation or favourable environmental conditions.	Unlikely to be able to be retained if sufficient space available above and below ground for future growth. Remedial work or improvement to growing environment unlikely to assist condition or vigour. Retention potential - Likely to be removed immediately or retained for Short Term. Potential for longer with remediation or favourable environmental condition

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Young (Y)	**YGVG - 9** **Index Value 9** Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height <5 m. High potential for future growth and adaptability. Retain, move or replace.	**YGVF - 8** **Index Value 8** Retention potential - Short – Medium Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium-high potential for future growth and adaptability. Retain, move or replace.	**YGVP - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVG - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5 m. Medium potential for future growth and adaptability. Retain, move or replace.	**YLVF - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height <5m. Low-medium potential for future growth and adaptability. Retain, move or replace.	**YLVP - 1** **Index Value 1** Retention potential - Likely to be removed immediately or retained for Short Term. Likely to provide minimal contribution to local amenity if height <5 m. Low potential for future growth and adaptability
Mature (M)	**MGVG - 10** **Index Value 10** Retention potential - Medium - Long Term.	**MGVF - 9** **Index Value 9** Retention potential - Medium Term. Potential for longer with improved growing conditions.	**MGVP - 6** **Index Value 6** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVG - 5** **Index Value 5** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVF - 4** **Index Value 4** Retention potential - Short Term. Potential for longer with improved growing conditions.	**MLVP - 2** **Index Value 2** Retention potential - Likely to be removed immediately or retained for Short Term
(O) Over-Mature	**OGVG - 6** **Index Value 6** Retention potential - Medium - Long Term.	**OGVF - 5** **Index Value 5** Retention potential - Medium Term.	OGVP - 4 **Index Value 4** Retention potential - Short Term	**OLVG - 3** **Index Value 3** Retention potential - Short Term. Potential for longer with improved growing conditions.	**OLVF - 2** **Index Value 2** Retention potential - Short Term.	**OLVP - 0** **Index Value 0** Retention potential - Likely to be removed immediately or retained for Short Term.

- Matrix - Sustainable Retention Index Value (SRIV)©

Use of this document and referencing

The Sustainable Retention Index Value (SRIV)© is free to use, but only in its entirety and must be cited as follows: IACA, 2010, *Sustainable Retention Index Value (SRIV)*, Version 4, A visual method of objectively rating the viability of urban trees for development sites and management, based on general tree and landscape assessment criteria, Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au .

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition.

An index value is given to each category where ten (10) is the highest value.

- GLOSSARY

Definitions for all terminology used in this report are taken from *AS4373- Pruning of amenity trees,* 2007, *AS4970- Protection of Trees on Development Sites*, 2009 and the *International Society of Arboriculture's Glossary of Arboricultural Terms*

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