

ALLIED TREE
CONSULTANCY

Level 5 and 8 Arboriculturist

Arboricultural Impact Assessment Report

For the site address

Long Reef Surf Life Saving Club
Lot 11 (D.P. 1193189)
Pittwater Road
COLLARROY, NSW

Prepared for

Adriano Pupilli Architects P/L
Level 1, 29 - 33 The Corso,
MANLY NSW

AUTHOR

Warwick Varley

STATUS

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REFERENCE

D3531

OFFICE

A PO Box 456, WOLLONGONG NSW 2520

P 1300 767 414

E admin@alliedtrees.com.au

W www.alliedtrees.com.au

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1.0 Introduction

1.1 The following Arborist report has been requested by *Adriano Pupilli Architects P/L* for the development proposal at the Long Reef Surf Life Saving Club. This development includes the construction of a clubhouse and related facilities. This report includes fourteen trees located on, and adjacent to the site proposed for development, and discusses the viability of these trees based on the proposed works.

1.2 This report will address for these trees, the:

- species' identification, location, dimensions, and condition;
- SULE and STARS rating;
- discussion and impact of the proposed works on each tree;
- recommendations for the removal, retention and/or pruning;
- tree protection zones and protection specifications for trees recommended for retention.

1.3 The subject site resides within Collaroy; for this reason, Northern Beaches Council is the consenting authority for any tree works recommended in this report.

2.0 Standards

2.1 Allied Tree Consultancy provides an ethical and unbiased approach to all assignments, possessing no association with private utility arboriculture or organisations that may reflect a conflict of interest.

2.2 This report must be made available to all contractors during the tendering process so that any cost associated with the required works for the protection of trees can be accommodated.

2.3 It is the responsibility of the project manager to provide the requirements outlined in this report relative to the Protection Zones, Measures (Section 7.0) and Specifications (Section 8.0) to all contractors associated with the project before the initiation of work.

2.4 All tree-related work outlined in this report is to be conducted in accordance with the:

- Australian Standard – AS4373; Pruning of Amenity Trees.
- Guide to Managing Risks of Tree Trimming and Removal Work¹.
- All tree works must be carried out at a tertiary level (minimum Certificate-level 3) qualified and experienced (minimum five years) arboriculturist.

¹ Safe Work Australia; July 2016; Guide to Managing Risks of Tree Trimming and Removal Work, Australia

- For any works in the vicinity of electrical lines, the arboriculturist must possess the ISSC26 endorsement (Interim guide for operating cranes and plant in proximity to overhead powerlines).

2.5 As a minimum requirement, all trees recommended for retention in this report must have removed all dead, diseased, and crossing limbs and branch stubs to be pruned to the branch collar. This work must comply with the local government tree policy (Northern Beaches Council) and Section 2.4.

2.6 Any tree stock subject to conditions for works carried out in this report must be supplied by a registered Nursery that adheres to the AS 2303; 2015².

- All tree stock must be of at least 'Advanced' size (minimum 75lt) unless otherwise requested.
- All tree stock requested must be planted with adequate protection. This may include tree guards (protect stem and crown) and if planted in a lawn area, a suitable barrier (planter ring) of an area, at least, 1m² to prevent grass from growing within the area adjacent to the stem.

3.0 Disclosure Statement

Trees are living organisms and, for this reason, possess natural variability. This cannot be controlled. However, risks associated with trees can be managed. An arborist cannot guarantee that a tree will be safe under all circumstances, nor predict the time when a tree will fail. To live or work near a tree involves some degree of risk, and this evaluation does not preclude all the possibilities of failure.

4.0 Methodology

4.1 The following tree assessment was undertaken using criteria based on the guidelines laid down by the International Society of Arboriculture.

4.2 The format of the report is summarised below;

4.2.1 Plan 1; Tree Location Relative to Site: This is an unscaled plan reproduced from the Survey Plan as referenced in Section 4.4.1, depicting the area of assessment.

4.2.2 Table 1; This table compiles the tree species, dimensions, brief assessment (history, structure, pest, disease or any other variables subject to the tree), significance, allocation of the zones of

² Australian Standard; 2015, AS2303, Tree stock for landscape use, Australia

protection (i.e., Tree Protection Zone³ ;TPZ and Structural Root Zone; SRZ) for each tree illustrated in Plan 1, Section 5.0. All measurements are in metres.

4.2.3 Discussion relating to the site assessment and proposed works regarding the trees.

4.2.4 Protection Specification; Section 8.0 details the requirements for that area designated as the Tree Protection Zone (TPZ), for those trees recommended for retention.

4.3 The opinions expressed in this report, and the material, upon which they are based, were obtained from the following process and data supplied:

4.3.1 Site assessment on the 20th August 2018 using the method of the Visual Tree Assessment⁴. This has included a Level 2 risk assessment, being a *Basic Assessment*⁵. The assessment has been conducted by Warwick Varley⁶ on behalf of *Allied Tree Consultancy*.

4.3.2 Trees included in this report are those that conform to the description of a prescribed tree by the local government policy.

4.3.3 All measurements, unless specified otherwise are taken from the tree centre.

4.3.4 Raw data from the preliminary assessment including the specimen's dimensions was compiled by the use of a diameter tape, height clinometer, angle finder, compass, steel probes, Teflon hammer, binoculars and recording instruments.

4.4 Documentation provided

The following documentation has been provided to Allied Tree Consultancy and utilised within the report.

4.4.1 Surveyor

Drawn by *Total Surveying Solutions P/L*

Date: 13 June 2017

Reference: 172507

Drawing No: 172507_A

³ Australian Standard, 4970; 2009 – Protection of Trees on Development Sites, Australia

⁴ Mattheck, C. Breloer, H.,1994, The Body Language of Trees – A handbook for failure analysis
The Stationary Office, London

⁵ Dunster J.A., 2013, Tree Risk Assessment Manual, International Society of Arboriculture, 2013, USA

⁶ Consulting Arborist, Graduate Certificate and Diploma of Arboriculture (level 8 and 5)

4.4.2 Design

Drawn by *Adriano Pupilli Architects*

Date: 3 December 2019

Reference: (Project No.) LRSC.01

Drawing No: 000- 020

4.4.3 Engineering (Footings)

Drawn by *Partridge Structural P/L*

Date: June 2019

Reference: (Job No.) 2017S0392

Drawing No: S2 (Revision P1)

4.4.4 Document

Stormwater Management Report

Author: *Wood and Grieve Engineers*

Date: 16 October 2019

Reference: Project No. 33241

Page: 26 pages

4.4.5 Document

Due Diligence Planning Report

Author: *DFP Planning Consultants*

Date: June 2018

Page: 22 pages

4.4.6 Document

Bushfire Assessment Report

Author: *GHD*

Date: 30 August 2019

Page: 3 pages

4.4.7 Document

Geotechnical Site Investigation

Author: *Crozier Geotechnical Consultants*

Date: March 2019

Page: n 20 pages

4.4.8 Landscape

Drawn by *Tyrrell Studio*

Date: 3 December 2019

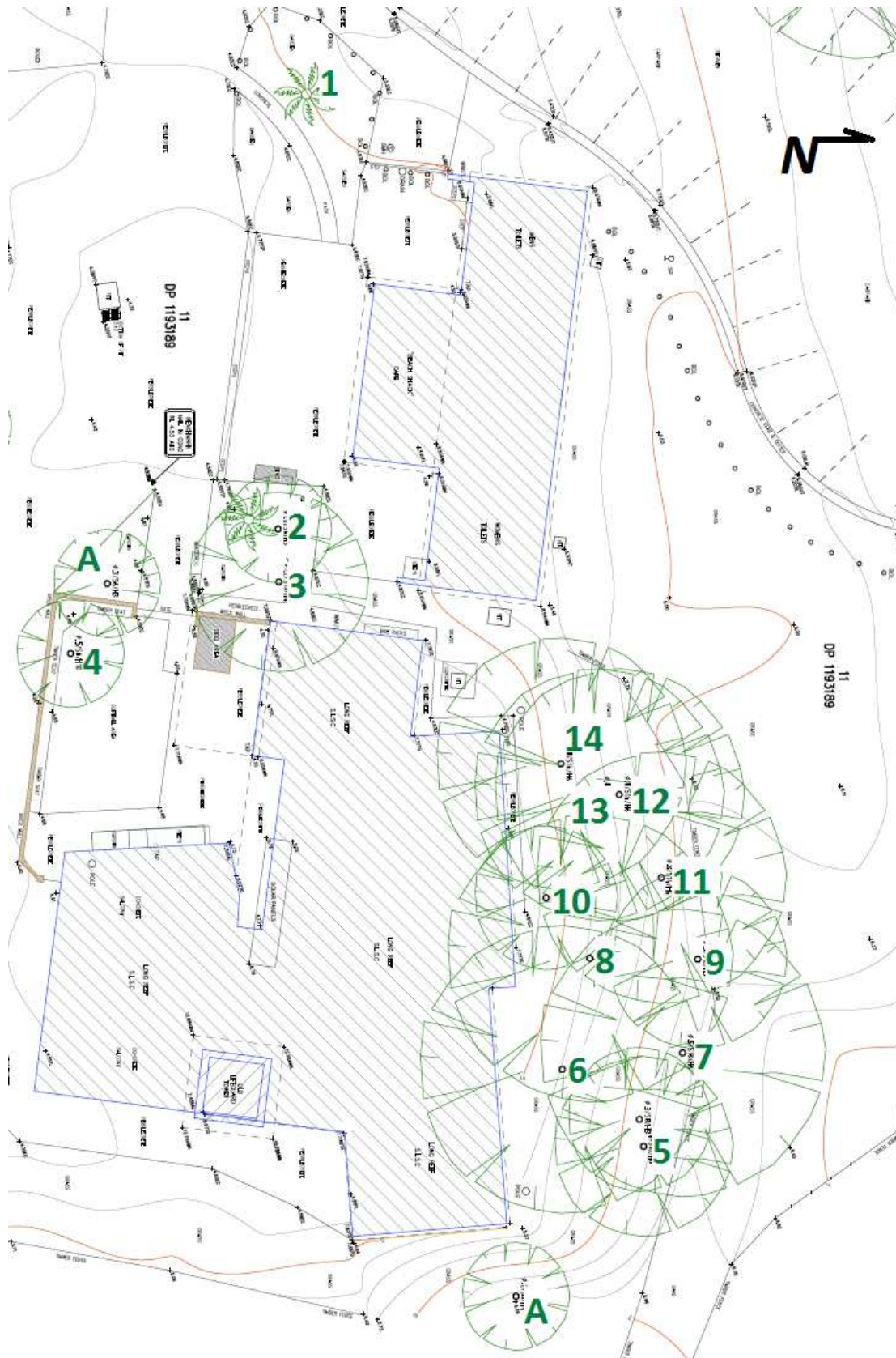
Reference: (Project No.) 1705

Drawing No: L001- L203

4.5 Limitations of the assessment/discussion process

- 4.5.1** The assessment has considered only those target zones that are apparent to the author and the visually apparent tree conditions, during the time of assessment.
- 4.5.2** Any tree, regardless of apparent defects, would fail if the forces applied to exceed the strength of the tree or its parts, for example, extreme storm conditions.
- 4.5.3** The assessment has been limited to that part of the tree, which is visible, existing from the ground level to the crown. Root decay can exist and in some circumstances provide no symptoms of the presence. This assessment responds to all the symptoms provided by a tree, however, it cannot provide a conclusive recommendation regarding any tree that may have extensive root decay that leads to windthrow without the appropriate symptoms.

5.0 Plan 1; Area of assessment illustrating tree location



Not to scale

Trees labelled A are exempt species, see Section 7.0.

Source: Adapted from *Total Surveying Solutions P/L*, see Section 4.4.1

6.0 Table 1 – Tree Species Data

Terminology/references provided in Appendix A.

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality	SULE Rating	STARS Rating	TPZ	SRZ
1	<i>Washingtonia sp.</i> Washington Palm	13	0.44	3 x 3	M	D	Sym.	A	A1	HIGH	3.0	1.5
<p>Assessment This tree is typical for the genus. Contained within a large island garden bed. Proposed works; See Section 7.1.2</p>												
2	<i>Pandanus amaryllifolius</i> Screwpine	5	0.16 X 3	4 x 4	M	C	SW	A	A1	MEDIUM	3.0	1.5
<p>Assessment This tree has a strong bias, as a result of the co-dominant class with a tree since removed. Composed of three leaders that initiate from a 0.5m high stem, these sweep north-west. Contained within a small island garden bed. Proposed works; See Section 7.1.1 and 7.1.5</p>												
3	<i>Pandanus amaryllifolius</i> Screwpine	5	0.25	5 x 5	M	C	N	A	A1	MEDIUM	3.0	1.5
<p>Assessment This tree has a strong bias, a result of the codominant class with a tree since removed. Composed of three leaders that initiate from a 1.5m high stem, these sweep north and some are in contact with the clubhouse roof. The lowest branch extending north (150mm in diameter) has a significant cavity and will require removal based on the risk. Contained within a small island garden bed. Proposed works; See Section 7.1.1 and 7.1.5</p>												
4	<i>Araucaria columnaris</i> Cook Pine	14	0.43	4 x 4	M	D	Sym.	B	A1/2	HIGH	5.2	2.3
<p>Assessment This tree is typical for the genus, however, has divided into two leaders at 9m and one of these leaders divides further. The tree provides the characteristic lean (towards the north) renown of the species. The tree is displaying symptoms of stress, past and recent dieback, and includes the upper portions of the leaders. This appears to be related to water deprivation and is likely related to the predominant sealing of the root zone by concrete on the southern side and synthetic grass in the courtyard where the tree resides. The stress is capable of mitigation and reversion. Contained within the courtyard. Proposed works; See Section 7.1.3 and 7.1.5</p>												

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality	SULE Rating	STARS Rating	TPZ	SRZ
5	<i>Banksia integrifolia</i> Coastal Banksia	6	0.34 0.16 0.26	5 x 6	M	C	N	A	A2	HIGH	5.5	2.4
<p>Assessment Composed of three leaders. Two leaders are sharing a common root crown, the third leader (Dbh; 0.16m) could be a separate tree or joined below ground level. This leader is strongly bowing, a result of the suppressed class. Based on the close association, grafted roots will exist, therefore has been considered a single entity. A large hanger exists in the smaller leader. Contained in a portion of the reserve.</p> <p>Proposed works; See Section 7.1.1</p>												
6	<i>Banksia integrifolia</i> Coastal Banksia	6	0.41	5 x 5	M	E	Sym.	A	A1	HIGH	4.9	2.3
<p>Assessment This tree presents as typical of the species for the group planting. Contained in a portion of the reserve.</p> <p>Proposed works; See Section 7.1.4</p>												
7	<i>Banksia integrifolia</i> Coastal Banksia	6	0.45	7 x 7	M	C	N	A	A1	HIGH	5.4	2.4
<p>Assessment This tree presents as typical of the species for the group planting. Contained in a portion of the reserve.</p> <p>Proposed works; See Section 7.1.1</p>												
8	<i>Banksia integrifolia</i> Coastal Banksia	6	0.44 ^B	6 x 6	M	I	Sym.	A	A1	HIGH	5.3	2.4
<p>Assessment This tree presents as typical of the species for the group planting. Some dieback exists on one of the two leaders. Contained in a portion of the reserve.</p> <p>Proposed works; See Section 7.1.3</p>												
9	<i>Banksia integrifolia</i> Coastal Banksia	6	0.39	4 x 4	M	I	Sym.	A	A1	HIGH	4.7	2.3
<p>Assessment This tree presents as typical of the species for the group planting. Contained in a portion of the reserve.</p> <p>Proposed works; See Section 7.1.1</p>												
10	<i>Banksia integrifolia</i> Coastal Banksia	7	0.30	4 x 4	M	I	Sym.	A	A1	HIGH	3.6	2.0

Tree No.	Botanical Name Common Name	Height (m)	DBH (m)	Crown Spread (m)	Age	Crown Class	Crown Aspect	Vitality	SULE Rating	STARS Rating	TPZ	SRZ
<p>Assessment This tree presents as typical of the species for the group planting. Contained in a portion of the reserve. Proposed works; See Section 7.1.4</p>												
11	<i>Banksia integrifolia</i> Coastal Banksia	4	0.38	4 x 4	M	C	N	A	A2	MEDIUM	4.6	2.2
<p>Assessment This tree has presented as typical of the species, however, it has failed via windthrow where part of the root system is exposed. This appears to have occurred within the preceding two years. The tree is still actively growing and does not present any further risk. This tree can be retained. Contained in a portion of the reserve. Proposed works; See Section 7.1.1</p>												
12	<i>Banksia integrifolia</i> Coastal Banksia	4	0.23 0.29	9 x 9	M	D	Sym.	A	A2	HIGH	4.4	2.2
<p>Assessment This tree presents as typical of the species for the group planting. The tree is composed of two leaders that are supported by an included crotch. No crotch symptoms exist that indicate any risk. This tree bows strongly to the north, and a partial leader failure exists from the failure of tree no. 11. Contained in a portion of the reserve. Proposed works; See Section 7.1.3</p>												
13	<i>Banksia integrifolia</i> Coastal Banksia	8	0.50	5 x 7	M	I	N	A	A1	HIGH	6.0	2.5
<p>Assessment This tree presents as typical of the species for the group planting. Contained in a portion of the reserve. Proposed works; See Section 7.1.3</p>												
14	<i>Banksia integrifolia</i> Coastal Banksia	8	0.57	3 x 5	M	S	N	A	A2	MEDIUM/ LOW	6.8	2.6
<p>Assessment This tree presents as typical of the species for the group planting. The tree was composed of two leaders that initiated from a 0.5m high stem. However, the western leader has been removed. Contained in a portion of the reserve. Proposed works; See Section 7.1.4</p>												

- A. Incomplete identification of species due to insufficiently available plant material
- B. Diameter taken below 1.4m due to low stem bifurcation
- C. estimate due to the overgrown area and/or limited access

- D. deciduous species, void of foliage at the time of assessment
- E. Level 3 assessment required to determine the accurate rating

7.0 Site Assessment

The area of assessment comprises a beachfront reserve. The lot has a consistent steep gradient with an eastern aspect immediately adjacent to Pittwater Road; however, levels out to an undulating landscape within the area of assessment. The overall gradient of the site containing the surf club is southeastern. An expansive asphalt car parking extends over the western side of the site and services exposed aggregate surfaces that extend over the southern area of the clubhouse and extending up to the vegetated foredunes. The clubhouse is a single-story brick construction, surrounded on the western, southern sides with concrete surfaces, and a detached ablutions block and kiosk are located on the western side of the clubhouse. A contained courtyard is located on the southern side of the clubhouse, and this is surrounded by a brick wall and sealed with synthetic turf. This area contains tree no. 4 and appears to have been constructed after the maturity of this tree based on the tree age and wall gap constructed for the root zone. Other plantings included in this assessment appear to be consistent with the landscaping of the clubhouse. This includes the Banksia grove (trees no. 5-14) located at the rear of the clubhouse. These are located on a bank with a moderate gradient and a southern aspect and extend up to the rear wall. The understory planting is sparse and consists of Lomandra and weeds. Based on the gradient, the clubhouse appears to have been excavated into the natural grade. A small proportion of the Banksia dripline extends over the clubhouse roof. Although due to the prevailing wind, these trees have been subject to flagging where the crowns predominately bow towards the north. This has also resulted with partial density of the southern side of the canopy. This group, although indigenous to the area, is likely to have been planted. This is based on a consistent age and size.

The trees labeled as A that have been included in the survey drawing (Plan 1) however, excluded from this report because of the failure to conform to the description of a prescribed tree based on the Northern Beaches Council Development Control Plan.

Tree A: trees below 5m in height or less than 100mm in diameter

7.1 Proposed development

The proposed development consists of the demolition of existing site structures and construction of three new buildings comprising, a two-story clubhouse, a single-story amenities block and a single-story café/locker storage building. This design will include landscaping around the buildings and the retention of existing vehicular access from Pittwater Road with no change to existing car park arrangement⁷.

⁷ Adapted from the *Due Diligence Planning Report*, Section 4.4.5

The calculations included in the following discussion have not considered;

- subsurface utilities that have not been included in the design,
- Work methods related to subsurface utilities, for example, concrete encasing or replacement of existing lines
- or work methods related to construction (stockpiling, site sheds, scaffolding) unless otherwise specified.

These may also increase the encroachment and tree impact and, therefore the opportunity for tree retention.

The lot is located within a bushfire zone and will require conforming to the recommendations referenced in the Bushfire Assessment Report (Section 4.4.6).

Assumption 1: the portion of the proposed building adjacent to the Banksia grove has a finished floor level (FFL) of 4.9 and the pathway skirting the rear of the building, that is adjacent to the Banksia grove has a finished grade of 4.61. The existing clubhouse has a FFL of 4.66. This is 240mm below the proposed floor level, although 50mm above the proposed pathway. Allowing for both the proposed and existing to contain similar footings, that is slab on ground with a drop edge beam, the excavation required for demolition of the existing building is assumed to be the same as the depth of the footing required for the proposed. Therefore any encroachment of the proposed building that overlaps with the existing is not considered to render any impact.

This report discusses the impact of the proposed design on the trees. Fourteen (14) trees have been listed within this report based upon the vicinity of the proposed works. This has included trees where any part of the zones of protection, Tree Protection Zone (TPZ), and Structural Root Zone (SRZ) encroach into the area proposed for development. This has been interpreted as the area of the building footprints. Recommendations based on the tree significance and condition, together with the impact on these trees regarding the development of this lot follow.

7.1.1 Trees and zones of protection (TPZ/SRZ) outside of the proposed design

Trees No. 2, 3, 5, 7, 9 and 11

None of the proposed works conflict with the location of these trees or respective zones of protection. These trees can be retained without impact by the proposed design.

Trees No. 2 and 3; see Section 7.1.5

7.1.2 Trees directly conflicting with the design

Tree No. 1

This tree is located in the footprint of the proposed design (café/locker storage building) and would require removal based on this premise alone. The conflict is the footprint of proposed locker A. This tree type allows a high success rate for transplanting however accounting for the exotic status and age, that is verging on senescence, an alternative option for compensatory planting of a mature tree species indigenous to the area is recommended, see Section 7.5.

7.1.3 Trees subject to a minor encroachment

Trees No. 4, 8, 12 and 13

These trees are not directly located in the footprint of the proposed design, however, are subject to a *minor encroachment*. That is, the proportion (<10%) of encroachment provided by design will not adversely impact on the tree. These trees could be retained relative to the design.

Tree No. 4; This tree is deemed a significant planting although displays decline. A mitigation program based on a minimum soil and tissue tests is required to be implemented as part of the development process and should initiate immediately.

Tree No. 4: The minor encroachment has been based on the building footprint and is acceptable. Although the drawing 010 (Section 4.4.2) provides an outline for the 'grease arrester" although no details referring to the extent of these works. This structure will increase the encroachment, and has been referred to be flexible by the designer. Therefore should be located outside the area of the TPZ (5.2m radius). Any further works within this area will need to be confirmed with the project arborist and likely require modification and/or moving structures outside of the TPZ.

Tree No. 4; see Section 7.1.5

7.1.4 Trees subject to a major encroachment

Trees No. 6, 10 and 14

These trees are not directly located in the footprint of the proposed design; however, they are located close and adjacent to the dwelling footprint and subject to a *major encroachment*, that is, in excess of 10% of the TPZ. The extent and type of encroachment for each tree are discussed and the relative implications.

Tree No. 6: Encroachment: 14%, based on Drawing 010. The encroachment consists of construction of the proposed clubhouse. This encroachment calculation has included the footprint of the proposed clubhouse only and has not included the stairs adjacent to the tree. These are assumed to be

cantilevered from the wall, therefore provide no further impact on the root zone. The encroachment is four percentage points over a minor encroachment and is not considered to present detriment to the tree. The existing clubhouse offers an encroachment of 8%, therefore based on Assumption 1, the tree has adapted to this structure and reduces the new encroachment to 6%.

Crown encroachment: the tree stem is location 1500mm from the staircase. The dripline extends approximately 2500mm from the tree; therefore, conflict and pruning will be necessary to accommodate this structure. Based on the angle of the staircase relative to the urn-shaped habit of the tree (that is specific branch location), the specific branch conflict is unknown, although is not considered to misshape the habit. This has not taken into account the construction methodology, and any pruning will require the project arborist to assess and determine pruning and alternative mitigation (including temporary tie back of branches) during construction, see Section 7.6.3, Part 8.

Tree No. 10: Encroachment: 17%; based on Drawing 010. The encroachment consists of the construction of the proposed clubhouse. This encroachment calculation has included the footprint of the proposed clubhouse only. The encroachment is seven percentage points over a minor encroachment and is not considered to present detriment to the tree. The existing clubhouse offers the same encroachment that falls within the same footprint therefore based on Assumption 1, the tree has adapted to this structure and should not offer any additional impact. Although a pathway is proposed to extend around the rear wall of the clubhouse and will increase the encroachment and is located approximately 500mm from the centre of the stem. Therefore placing this structure near flush with the root flare and tree maturity could either compromise this pathway or the construction could compromise underlying roots within the SRZ. The pathway can be retained, and based on discussion with the designer, options for elevating the pathway grade exist. Therefore allowing for reducing any impact on the tree and pathway. The construction methods and materials will need to be sympathetic towards underlying roots. Based on the proposed vicinity, root mapping for the path route should proceed before construction, and this may require amended methods and surfaces to allow for tree retention pending results of the root mapping, see Section 7.7.1.

Crown encroachment: the tree stem is location 2000mm from the clubhouse. The dripline will be tangential to the clubhouse and should not require substantial pruning. This has not taken into account the

construction methodology, and any pruning will require the project arborist to assess and determine pruning and alternative mitigation (including temporary tie back of branches) during construction, see Section 7.6.3, Part 8.

Tree No. 14: Encroachment: 23%; based on Drawing 010. The encroachment consists of the construction of the proposed clubhouse. This encroachment calculation has included the footprint of the proposed clubhouse only. The encroachment is thirteen percentage points over a minor encroachment and is of sufficient amount that could present detriment to the tree. The existing clubhouse offers the same encroachment, that falls within the same footprint therefore based on Assumption 1, the tree has adapted to this structure and should not offer any additional impact. Although two additional structures are proposed, and they are a pathway to extend around the rear wall of the clubhouse and a 'new terraced bench seating'. Both will increase the encroachment and are discussed.

The pathway is located approximately 1100mm from the centre of the stem. Therefore placing this structure within the SRZ. The pathway can be retained although the construction methods and materials will need to be sympathetic towards underlying roots. Based on the proposed vicinity, root mapping for the path route should proceed before construction and pending the root mapping results, the construction methods and surfaces modified to allow for tree retention, see Section 7.7.1.

The 'new terraced bench seating' (that is 'Wall 6', Drawing LR-L111) is 500mm from the tree centre and within the SRZ. The means of support for this structure are unknown, although will likely require a deeper footing for the retaining support of soil and assumed as a retaining wall. The TOW (Drawing LR-L121) for each bench seat is increased above grade up to 300mm, therefore suggesting minimal excavation is required, although fill will form part of the design. Based on this assumed structure, the encroachment into the SRZ could compromise significant roots and should be modified. The following conditions are required;

- The edge of the 'terraced bench seating' is to be no closer than 1000mm from the girth of the tree.
- No footing should be located within the SRZ, 2300mm from the tree centre other than a screw-type footing. This will require to be cantilevered structure and reside above natural grade.
- The bench seating that falls within the TPZ will require a screw-type footing as support.

- Fill material in excess of 200mm depth will require a layer of blue metal aggregate (40mm) to be placed as the base, and remaining soil fill (texture; sandy loam) to be separated from the blue metal with geotextile.
- No strip type excavation within the TPZ any greater than 100mm.

Crown encroachment: the tree stem is location 3000mm from the clubhouse. The dripline will be tangential to the clubhouse and should not require substantial pruning. This has not taken into account the construction methodology, and any pruning will require the project arborist to assess and determine pruning and alternative mitigation (including temporary tie back of branches) during construction, see Section 7.6.3, Part 8.

7.1.5 Proposed surfaces

Trees No. 2, 3 and 4

The drawing 010 (Section 4.4.2) provides an introduced surface around the predominant area of the TPZ for each tree. The two surfaces are described as a 'unitised paver, varying infills' and 'sand catchment groynes'.

The 'unitised paver, varying infills' is assumed to be a porous type paver that allows water percolation and gas exchange to the root system. The foundation for this surface is assumed to require a thickness of up to 200mm (paver thickness 100mm, roadbase/sand 100mm). With further potential issues relate to the footing necessary for the edge of such products and based on the sandy soil texture, could likely require a deep footing resulting in further detriment to the root system. The finished grade adjacent to the SRZ is 4.65 which is the same as the existing grade, therefore indicating that a cut of 200mm is required to adopt the nominated grade. This will impact on the root system and will require modification of the grade based on the use of this surface. The following conditions are required for the surface around this tree;

- The existing grade is retained and the paver foundation laid over the top
- The paver foundation utilise a media that is porous after installation.
- A gap of at least 1000mm is retained between the edge of the paving and girth. Rooting mapping of this area before any foundation is employed for the paving edge is conducted before installation. This may require modification of the foundation design or location of the paver edge.
- The section void of pavers adjacent to the stem shall be filled with organic mulch.

The 'sand catchment groynes' are assumed concrete construction, therefore can offer a foundation that could compromise the root system within the TPZ. Therefore the following conditions will be required for these structures that fall within the TPZ's;

- No grade changes greater or less than 100mm in the area of the TPZ can occur
- The structures will require to be elevated above natural grade and supported by screw-type footings.

7.2 Planning for Bushfire Protection

Based on the Bushfire Report (Section 4.4.6), the proposed facilities and trees forming the development are not within a bushfire zone; therefore, no further management of the trees for protection against bushfire is required.

7.3 Sub-surface utilities

The drawings provided for the proposed route of sub-surface utilities are illustrated in the report by *Wood and Grieves Engineers* (Section 4.4.4). Works are proposed adjacent to trees No. 3 and 4. These will increase the impact and, therefore encroachment and shall require the following conditions.

- Any trenching shall be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed trenching/excavation shall be re-routed outside of the TPZ's. Under boring may be required if a limitation for the route of a service is restricted to an area that falls within the TPZ from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

7.4 Unexpected loss of any site tree

Based on the potential loss of any site tree during the demolition or construction process, be it related to storm damage, construction/demolition damage, vandalism, amended designs, etc. Compensatory planting of a similar species and based on the requirements of Section 7.5 is required.

7.5 Compensatory planting

Based upon any tree loss. Compensatory planting is recommended to be included within the landscape plan. The tree species chosen must produce a mature height of at least 10m. The stock must be of at least 'Advanced' size (minimum 150 lt) and supplied by a registered Nursery that adheres to the Australian Standard 2303 . Trees must be planted with adequate protection. This may include tree guards (protect stem and crown) and if planted in a lawn area, a suitable barrier (planter ring) of an area at least 1m² to prevent grass from growing within the area adjacent to the stem. The tree should be introduced after construction is completed and during landscaping.

7.6 Protection measures

Tree protection measures will be required during the demolition and construction stage. However, the design of these will be pending the work methodology and final design. The project arborist shall be contracted after the completion/confirmation of design work for the instruction of the protection measures implementation, which is the Arboricultural Method Statement. Examples of protection measures are contained in Appendix B.

The following protection measures are proposed to be implemented for the following trees before initiation of site works (including demolition/excavation) and retained until the landscaping works are required unless otherwise specified. These offer the minimum requirement and will likely require modification based on the Arboricultural Method Statement.

7.6.1 Protective fence: Trees No. 2-14

A protective fence is required to be installed to protect the TPZ from all site-related work and are recommended to be located in accordance with the requirements of the AS 4970, listed in Appendix B. The fence is required to be secured to the ground with pegs to avoid movement during construction. This must be installed prior to the commencement of any demolition, excavation or construction works and shall be maintained throughout the entire construction phase of the development, and until landscaping works and installation of the drive/cross-overs is required.

7.6.2 Conditions of demolition: Trees No. 2, 3, 4, 6, 10, and 14.

The following conditions are required during the demolition stages for the zones of protection.

1. The demolition process must remove all other site structures before the removal of the concrete surfaces (including the portion of the drive) that are within the TPZ's. These will be the final structures removed from the site.
2. Machinery can be used for part of this removal; however, it must always be retained to a hard surface (drive or slab). No machine should, on any occasion, work on a soil/lawn based surface within the area of the TPZ.
3. That part of the concrete surface that falls within the area of 4m radius from the girth of the tree must be removed via hand tools, e.g., Jackhammers, etc. removal of the remaining concrete must disturb as little area beneath the drive surface as possible. That is, the removal of this area should not carry any soil with it.
4. If machinery is required to enter the TPZ where no hard surface exists, then ground protection methods are required to be employed. Any machinery used within this process must provide for a minimum

height of 2500mm, and that sufficient clearance is offered beneath the branch structure and machine to avoid injury. No pruning can occur for access to machinery.

7.6.3 Additional measures: Trees No. 1, 2, 3 and 4

The following conditions are required immediately after the removal of the existing surfaces around the TPZ's for these trees.

5. A mulch layer is required to be installed in the area of the TPZ. The mulch must be composted coarse wood chips to 75-100 mm depth (and no deeper) over the area of the. The mulch is required to extend over all areas of exposed ground within the TPZ. The mulch must be maintained at a minimum depth of 75 mm for the duration of the project.
6. A computerised irrigation system is required to be installed over the TPZ and includes a drip type irrigation. The watering schedule must be implemented by the project arborist.
7. A management program utilising the application of a root stimulant is required. The first application is recommended to initiate immediately after removal of the existing surfaces and continue during Spring and Summer only. The application is recommended to occur once a month. A non-synthetic type is recommended, such as 'Seasol', 'Tri-Kelp', and applied as a diluted root drench via a hose applicator, appropriate to the manufacturers' recommendations. In addition to the soil drench, a surfactant (wetting agent) and carbohydrate treatment (includes the addition of 25-50 gms of caster sugar per litre of water) are required. These ingredients can be combined and applied via a single application

Pruning: Trees No. 3, 6, 8, 10 and 14

8. The project arborist is required on-site before pruning starts and includes a discussion with the utility arborist and site manager to determine the strategy and proportion of pruning to reduce the impact on the trees. The arborist must be in attendance during the pruning and until completion.

7.6.4 Conditions for compliance

The following conditions are required before any works proceed on site.

Site induction; All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work. This is required as part of the site induction process.

Project Arborist; A project arborist who conforms to the requirements of the AS 4970 is required to be nominated immediately after a *Notice of Determination* is issued, and they are to be provided with all related site documents.

7.7 Compliance Documentation

The following stages will require assessment and documentation (report, letter, certification) by the project arborist or person responsible for the specific work type, and the related documentation is to be issued to the principal certifying agent.

7.7.1 Table 2; Assessment/Certification stages

Hold Points	Work type	Document required
Pre-demolition	See Section 7.6	Arboricultural Method Statement, pending works
Pre-demolition	Installation of the protection measures, Section 7.6.1	Certificate*
During demolition	Section 7.6.2, Project arborist present	-
Post demolition, Pre/during construction	Section 7.6.3, Project arborist present	-
Post demolition, Pre/during construction	Pruning of trees, Section 7.6.3, Project arborist present	Certificate*
During construction	Rootmapping of trees No. 10 and 14 to determine pathway design	Report
During construction	Three monthly site inspections	Certificate*
During construction	Any <u>further works</u> required within the area of the TPZ, or decline related to the trees that have not been covered by this report.	Report Brief
During construction	Any crown modification including pruning or root disturbance.	Report Brief

Construction refers to the time between the initiation of demolition and until an occupation certificate is issued.

*Mandatory

8.0 Protection Specification

The retention and protection of trees provide for the requirement of the Tree Protection Zone (TPZ) to conform to the conditions outlined below. These conditions provide the limitations of work permitted within the area of the Tree Protection Zone (TPZ) and must be adhered to unless otherwise stated.

1. Foundation/footing types should not be strip type, but utilise footing types that are sympathetic towards retaining root system that is, screw, pier, etc. Slab on the ground can be accommodated in some circumstances and will be nominated by the project arborist. The extent of encroachment will be dependent upon the tree species, soil type (texture and profile) and gradients.
2. Subsurface utilities can extend through the TPZ and Structural Root Zone (SRZ), however, are limited to the method of installation. That is under boring is permitted, however trenching is limited and depends on the proposed route within the TPZ. No trenching is permitted within the area of the TPZ unless stipulated by the project arborist.
3. Crown pruning can be accommodated, however, must conform to the AS 4373; *Pruning of Amenity Trees*, and not misshape the crown nor remove in excess of 10-15% of the existing crown, pending on the species, and vitality. The opportunity for, type and proportion of pruning will be required to be nominated by the project arborist.
4. Soil levels within the TPZ must remain the same. Any excavation within the TPZ must have been previously specified and allowed for by the project arborist:
 - a) So it does not alter the drainage to the tree.
 - b) Under specified circumstances,
 - o Added fill soil does not exceed 100mm in depth over the natural grade. Construction methodologies exist that can allow grade increases in excess of 100mm, via the use of an impervious cover, an approved permeable material or permanent aeration system or other approved methods.
 - o Excavation cannot exceed a depth of more than 50mm within the area of the TPZ, not including the SRZ. The grade within the SRZ cannot be reduced without the consent from a project arborist.
5. No form of material or structure, solid or liquid, is to be stored or disposed of within the TPZ.
6. No lighting of fires is permitted within the TPZ.

7. All drainage runoff, sediment, concrete, mortar slurry, paints, washings, toilet effluent, petroleum products, and any other toxic wastes must be prevented from entering the TPZ.
8. No activity that will cause excessive soil compaction is permitted within the TPZ. That is, machinery, excavators, etc. must refrain from entering the area of the TPZ unless measures have been taken, and with consultation with the project, arborist to protect the root zone.
9. No site sheds, amenities or similar site structures are permitted to be located or extend into the area of the TPZ unless the project arborist provides prior consent.
10. No form of construction work or related activity such as the mixing of concrete, cutting, grinding, generator storage or cleaning of tools is permitted within the TPZ.
11. No part of any tree may be used as an anchorage point, nor should any noticeboard, telephone cable, rope, guy, framework, etc. be attached to any part of a tree.
12. (a) All excavation work within the TPZ will utilise methods to preserve root systems intact and undamaged. Examples of methods permitted are by hand tools, hydraulic, or pneumatic air excavation technology.
 - (b) Any root unearthed which is less than 50mm in diameter must be cleanly cut and dusted with a fungicide, and not allowed to dry out, with minimum exposure to the air as possible.
 - (c) Any root unearthed which is greater than 50mm in diameter must be located regarding their directional spread and potential impact. A project arborist will be required to assess the situation and determine future action regarding retaining the tree in a healthy state.

Project Arborist: person nominated as responsible for the provision of the tree assessment, arborist report, consultation with stakeholders, and certification for the development project. This person will be adequately experienced and qualified with a minimum of a level 5 (AQF); Diploma in Horticulture (Arboriculture)⁸.

⁸ Based upon the definition of a 'consulting arborist' from the AS 4970; Protection of trees on development sites; 2009, section 1.4.4, p 6.

9.0 Summary of tree impact by design

Based on the design supplied, the following summary provides the impacts imposed on the trees included in this report.

9.1 Trees No. 2-5, 7-9 and 11-13

These trees are not adversely impacted by the design, that is, they conform to a minor encroachment or less and the nominated zones of protection (TPZ, SRZ) based on the requirements of the Protection Specification, Section 8.0. The proposed design does not adversely affect these trees, although the following conditions are required to ensure long term tree retention;

1. Tree No. 3

The lowest branch extending north (150mm in diameter) has a significant cavity and will require removal based on the risk.

2. Tree No. 4

- Ensure the 'grease arrester' is located outside of the TPZ.
- A mitigation program based on a minimum soil and tissue tests is required to be implemented as part of the development process and should initiate immediately.

3. Trees No. 3 and 4

The following conditions are required for the proposed surfaces around these trees;

- The existing grade is retained and the paver foundation laid over the top
- The paver foundation utilise a media that is porous after installation.
- A gap of at least 1000mm is retained between the edge of the paving and girth. Root mapping of this area before any foundation is employed for the paving edge is conducted before installation. This may require modification of the foundation design or location of the paver edge.
- The section void of pavers adjacent to the stem shall be filled with organic mulch.

The following conditions will be required for the 'sand catchment groynes' that fall within the TPZ's;

- No grade changes greater or less than 100mm in the area of the TPZ can occur
- The structures will require to be elevated above natural grade and supported by screw-type footings.

9.2 Tree No. 1

The proposed design will impact adversely on this tree and is unable to be retained based on the design. Compensatory planting of a tree species

indigenous to the area is recommended and the conditions outlined in Section 7.4.

9.3 Trees No. 6, 10 and 14

These trees are subject to a major encroachment, although they could be retained pending the following conditions/design modification.

Trees No. 6 and 10

4. The extent of pruning for design is not considered to impact on these trees. This has not taken into account the construction methodology, and any pruning will require the project arborist to assess and determine pruning and alternative mitigation (including temporary tie back of branches) during construction, see Section 7.6.3, Part 8.

Trees No. 10 and 14

5. The pathway can be retained, and based on discussion with the designer, options for elevating the pathway grade exist. The construction methods and materials will need to be sympathetic towards underlying roots. Root mapping for the path route should proceed before construction, and this may require amended methods and surfaces to allow for tree retention pending results of the root mapping, see Section 7.6.1.

Tree No. 14

6. Based on the 'new terraced bench seating' the following conditions are required to ensure long term tree retention;
 - The edge of the 'terraced bench seating' is to be no closer than 1000mm from the girth of the tree.
 - No footing should be located within the SRZ, 2300mm from the tree centre other than a screw-type footing. This will require to be cantilevered structure and reside above natural grade.
 - The bench seating that falls within the TPZ will require a screw-type footing as support.
 - Fill material in excess of 200mm depth will require a layer of blue metal aggregate (40mm) to be placed as the base, and remaining soil fill (texture; sandy loam) to be separated from the blue metal with geotextile.
 - No strip type excavation within the TPZ any greater than 100mm.

9.4 Sub-surface utilities

Works are proposed adjacent to trees No. 3 and 4. These will increase the impact and, therefore encroachment and shall require the following conditions.

- Any trenching shall be avoided within the area of the TPZ's for any tree nominated for retention. Any proposed trenching/excavation shall be re-routed outside of the TPZ's. Under boring may be required if a limitation for the route of a service is restricted to an area that falls within the TPZ

from any tree. Any excavation in the area of a TPZ must be authorised and conditioned by the project arborist.

9.5 Unexpected loss of any site tree

Based on the potential loss of any site tree during the demolition or construction process, be it related to storm damage, construction/demolition damage, vandalism, amended designs, etc. Compensatory planting of a similar species and based on the requirements of Section 7.5 is required.

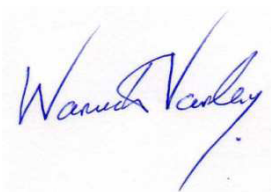
9.6 Protection measures

Protection measures (outlined in Section 7.6 and 7.7) are required to be implemented for the trees nominated for retention (referenced in Section 9.1) and installed before initiation of site works (including demolition/excavation) and retained until the landscaping works are required unless otherwise specified.

All workers related to the construction process and before entering the site must be briefed about the requirements/conditions outlined in this report relative to the zone of protection, measures, and specifications before the initiation of work.

A project arborist is required to be nominated, and the stages and related certification or similar documentation is to be issued to the principal certifying agent.

The opinions expressed in this report by the author have been provided within the capacity of a Consulting Arborist. Any further explanation or details can be provided by contacting the author.



Warwick Varley
Consulting Arborist
Level 5 and 8; Arboriculture
MIACA; Reg. #18
MISA
MIAH; Reg. # 32



10.0 Appendix A- Terminology Defined

Height

Is a measure of the vertical distance from the average ground level around the root crown to the top surface of the crown, and on palms - to the apical growth point.

DBH

Diameter at Breast Height – being the stem diameter in meters, measured at 1.4m from ground level, including the thickness of the bark.; Mult. refers to multiple stems, that is in excess of 4 stems.

Crown Spread

A two-dimension linear measurement (in metres) of the crown plan. The first figure is the north-south span, the second being the east-west measurement.

Age

Is the estimate of the specimen's age based upon the expected lifespan of the species. This is divided into three stages.

Young (Y)	Trees less than 20% of life expectancy.
Mature (M)	Trees aged between 20% to 80% life expectancy.
Over-mature (O)	Trees aged over 80% of life expectancy with probable symptoms of senescence.

Crown Aspect

In relation to the root crown, this refers to the aspect the majority of the crown resides in. This will be either termed Symmetrical (Sym.) where the centre of the crown resides over the root crown or the cardinal direction the centre of the crown is biased towards, being either North (N), South (S), East (E) or West (W).

Vitality Rating

Is a rating of the health of the tree, irrespective and independent of the structural integrity, and defined by the 'ability for a tree to sustain its life processes' ((Draper, Richards, 2009). This is divided between three variables, and based on the assessment of symptoms including, but not limited to; leaf size, colour, crown density, woundwood development, adaptive growth formation, and epicormic growth.

A: Normal vitality, typical for the species

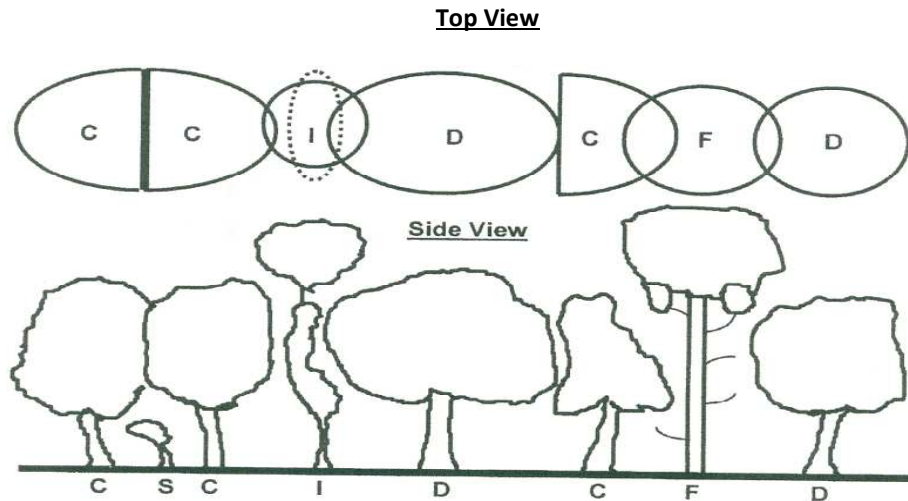
B: Below average vitality, possibly temporary loss of health, partial symptoms.

C: Poor vitality; obvious decline, potentially irreversible

Crown Class

Is the differing crown habits as influenced by the external variables within the surrounding environment. They are:

D – <i>Dominant</i>	Crown is receiving uninterrupted light from above and sides, also known as emergent.
C – <i>Codominant</i>	Crown is receiving light from above and one side of the crown.
I – <i>Intermediate</i>	Crown is receiving light from above but not the sides of the crown.
S – <i>Suppressed</i>	Crown has been shadowed by the surrounding elements and receives no light from above or sides.
F – <i>Forest</i>	Characterised by an erect, straight stem (usually excurrent) with little stem taper and virtually no branching over the majority of the stem except for the top of the tree which has a small concentrated branch structure making up the crown.



D C, I & S, and side view, after (Matheny, N. & Clark, J. R. 1998, *Trees Development*, Published by International Society of Arboriculture, P.O. Box 3129, Champaign IL 61826-3129 USA, p.20, adapted from the Hazard Tree Assessment Program, Recreation and Park Department, City of San Francisco, California).

Levels of assessment

Level 1: Limited visual: a visual tree assessment to manage large populations of trees within a limited period and in order to identify obvious faults which would be considered imminent.

Level 2: Basic assessment: a standard performed assessment providing for a detailed visual assessment including all parts of the tree and surrounding environment and via the use of simple tools.

Level 3: Advanced assessment: specific type assessments conducted by either arborist who specialise with specific areas of assessment or via the use of specialised equipment. For example, aerial assessment by use of an EWP or rope/harness, or decay detection equipment.

TPZ; Tree Protection Zone

Is an area of protection required for maintaining the trees vitality and long-term viability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

The size of the Tree Protection Zone (TPZ) has been calculated from the *Australian Standard, 4970; 2009 – Protection of Trees on Development Sites*

The TPZ does not provide the limit of root extension, however, offers an area of the root zone that requires predominate protection from development works. The allocated TPZ can be modified by some circumstances; however will require compensation equivalent to the area loss, elsewhere and adjacent to the TPZ.

SRZ; Structural Root Zone

Is the area around the tree containing the woody roots necessary for stability. Measured in meters as a radius from the trees centre. The requirements of this zone are outlined within the Protection Specification, Section 8.0, and are to be adhered to unless otherwise stated.

Protection Measures

These are required for the protection of trees during demolition/construction activities.

Protective barriers are required to be installed before the initiation of demolition and/or construction and are to be maintained up to the time of landscaping. Samples of the recommended protection measures are illustrated in Appendix B.

All other definitions are referenced from;

Draper D.B., Richards P.A., 2009, *Dictionary for Managing Trees in Urban Environments* CSIRO Pub., Australia

Significance Rating, Significance of a Tree Assessment Rating System (S.T.A.R.S), IACA, 2010⁹

Tree Significance – Assessment Criteria

1. High Significance in landscape

- The tree is in good condition and good vitality;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ – tree is appropriate to the site conditions.

2. Medium Significance in landscape

- The tree is in fair-good condition and good or low vitality;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
- The tree provides a fair contribution to the visual character and amenity of the local area,
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.

3. Low Significance in landscape

- The tree is in fair-poor condition and good or low vitality;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
- The tree's growth is severely restricted by above or below ground influences,

⁹ IACA, 2010, IACA Significance of a Tree, Assessment Rating System (STARS), Institute of Australian Consulting Arboriculturists, Australia, www.iaca.org.au

unlikely to reach dimensions typical for the taxa in situ – tree is inappropriate to the site conditions,

- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
 - The tree has a wound or defect that has potential to become structurally unsound.
- Environmental Pest / Noxious Weed Species
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
 - The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline

- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short-term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g.

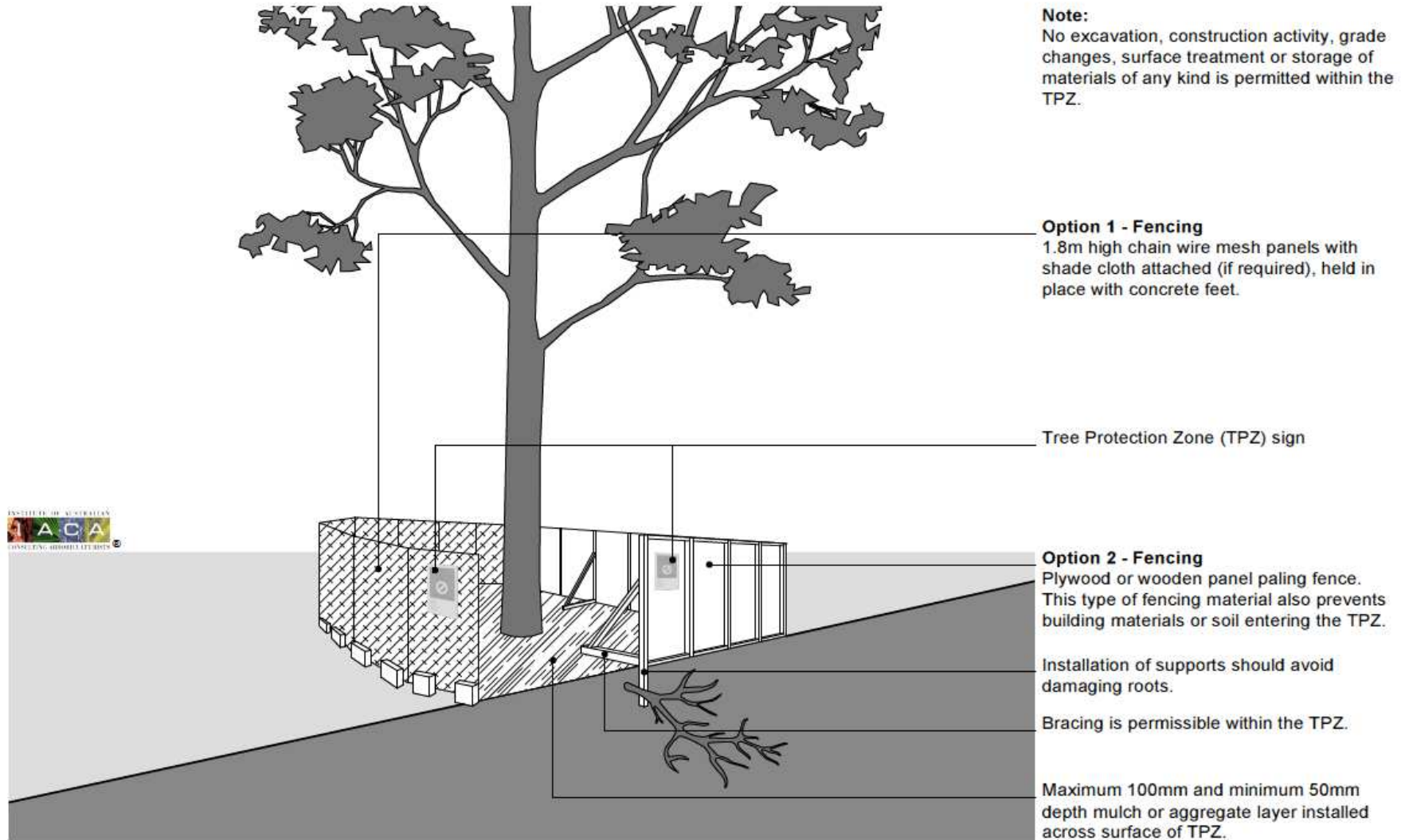
Table 3; Tree Retention Value – Priority Matrix.

		Significance				
		1. High Significance in Landscape	2. Medium Significance in Landscape	3. Low Significance in Landscape	Environmental Pest / Noxious Weed Species	Hazardous / Irreversible Decline
Estimated Life Expectancy	1. Long >40 years					
	2. Medium 15-40 Years					
	3. Short <1-15 Years					
	Dead					
Legend for Matrix Assessment						
	Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 <i>Protection of trees on development sites</i> . Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.					
	Consider for Retention (Medium) - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.					
	Consider for Removal (Low) - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.					
	Priority for Removal - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.					

Safe Useful Life Expectancy – S.U.L.E (Barell 1995)

	1. Long	2. Medium	3. Short	4. Removal	5. Moved or Replaced
	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 15 – 40 years with an acceptable level of risk.	Trees that appeared to be retainable at the time of assessment for 5 – 15 years with an acceptable level of risk.	Trees that should be removed within the next 5 years.	Trees which can be reliably moved or replaced.
A	Structurally sound trees located in positions that can accommodate future growth.	Trees that may only live between 15 and 40 years.	Trees that may only live between 5 and 15 more years.	Dead, dying, suppressed or declining trees through disease or inhospitable conditions.	Small trees less than 5m in height.
B	Trees that could be made suitable for retention in the long term by remedial tree care.	Trees that may live for more than 40 years but would be removed for safety or nuisance reasons.	Trees that may live for more than 15 years but would be removed for safety or nuisance reasons.	Dangerous trees through instability on recent loss of adjacent trees.	Young trees less than 15 years old but over 5m in heights
C	Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.	Trees that may live for more than 40 years but would be removed to prevent interference with more suitable individuals or to provide space for new planting.	Trees that may live for more than 15 years but should be removed to prevent interference with more suitable individuals or to provide space for new planting.	Damaged trees through structural defects including cavities, decay, included bark, wounds or poor form.	Trees that have been pruned to artificially control growth.
D		Trees that could be made suitable for retention in the medium term by remedial tree care.	Trees that require substantial remedial tree care and are only suitable for retention in the short term.	Damaged trees that are clearly not safe to retain.	
E				Trees that may live for more than 5 years but should be removed to prevent interference with more suitable individuals or to provide space for new plantings.	
F				Trees that are damaging or may cause damage to existing structures within 5 years.	
G				Trees that will become dangerous after removal of other trees for reasons given in (A) to (F).	

**Appendix B- Protection measures;
Protective fence**



Stem and Ground protection

