



# Arboricultural Impact Assessment Report



**Lot 8 Knight Street, Warriewood, NSW, 2102**

Prepared for

Sekisui House

Prepared by

Tarek Hussein

AQF Level 5 Consulting Arborist

13<sup>th</sup> of August 2023

Version 2.0

**The Tree Guardian**

**Arboricultural Consultancy**

2/53A Park Road, Carlton NSW 2218

E: [info@thetreeguardian.com.au](mailto:info@thetreeguardian.com.au)

M: 0404 524 526

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## 2.0 INTRODUCTION

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This report was commissioned by Ms. Mary Kazzi of Sekisui House Australia Holdings Pty Ltd to accompany a Development Application for the construction of a new dwelling located at Lot 8 Knight Street, Warriewood, NSW, 2102.

The purpose of this report is to assess the current health and condition of individual trees within the site and any tree outside the site (including trees in neighbouring properties, street trees, and park trees) that may be impacted by the proposed development.

The report has been prepared in accordance with the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*, *Pittwater 21 Development Control Plan (DCP)* and the Australian Standards '*AS4970:2009 - Protection of Trees on Development Sites*'.

## 3.0 METHODOLOGY

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An assessment of any tree contained within this report was limited to a visual assessment from ground level. A summary of the findings from the assessment are detailed in the Tree Assessment Schedule appended to this report. Information included in the table which will be relied upon throughout the report and form the basis of the discussions and recommendations includes:

- ♦ Species Name
- ♦ Height and Spread (metres)
- ♦ Diameter at Breast height (DBH)
- ♦ Age Class
- ♦ Health
- ♦ Structure
- ♦ Landscape Significance
- ♦ Remaining Life Expectancy
- ♦ Retention Value
- ♦ Tree Protection Zone (TPZ)
- ♦ Structural Root Zone (SRZ)

(See Appendix A - Definition and Criteria for further explanation)

The height and canopy spread of each tree was estimated. A metric diameter measuring tape was used to establish the trunk Diameter at Breast Height (DBH) and is recorded in millimetres.

A Smart Phone was used for the purpose of providing photographic evidence which may be cross referenced by persons who have obtained this report for the purpose of reading and analysing the information that has been discussed throughout.

Aerial inspection, root or soil analysis, exploratory root trenching and internal diagnostic testing has not been undertaken.

### 3.1 Tree Protection Zone and Structural Root Zone

The Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) has been calculated in accordance with the *Australian Standard AS 4970-2009, 'Protection of Trees on Development Sites*'.

## 4.0 SITE DESCRIPTION

The subject site is a vacant lot known as Lot 8 Knight Street, Warriewood, NSW, 2102. The subject site is irregular in shape and is approximately 828m<sup>2</sup> in land size. The site land is zoned category R3: Medium Density Residential pursuant to the *Pittwater Local Environmental Plan 2014 (pub. 30-5-2014)* and is legally defined as Lot 8 in Deposited Plan 270922.

Soil of this area is typical of Watagan Soil Landscape Group (as classified in the Soil Landscapes of the Sydney 1:100,000 Sheet). This consisting of rolling to steep hills on fine-grained Narrabeen Group sediments. Soils are typically shallow to deep (30-200cm) *Lithosols/Siliceous Sands* and *Yellow Podzolic Soils* on sandstones, moderately deep *Brown Podzolic Soils*, *Red Podzolic Soils* and *Greyed Podzolic Soils* on shales.



Figure 1 - Aerial view of subject site (source: SIX Maps)

### 4.1 Legislation and Planning Controls

Planning Control	Relevant	Not Relevant
Land Zoning	R3	
10/50 Vegetation Clearing Entitlement Area		✓
Acid Sulfate Soils	Class 5	
Foreshore Building Line		✓
Flood Prone Land		✓
Heritage Conservation Area		✓
Heritage Listed Site		✓
Terrestrial Biodiversity	✓	

## 5.0 OBSERVATIONS

### 5.1 Trees

A total of 7 trees were inspected on the 27<sup>th</sup> of February 2023. The general health and structural condition of the trees has been assessed as ranging from good to poor. Individual assessment findings are detailed in Appendix C - Tree Assessment Schedule.

### 5.2 Tree Significance

Determined by an assessment of the cultural, environmental and aesthetic value of individual trees - Appendix B, the following Landscape Significance findings were made for the 7 assessed trees.

#### Significance Scale:

**1 – High**

**2 – Medium**

**3 – Low**

**4 - Insignificant**

Significance	High	Medium	Low	Insignificant
Tree Number	1, 2, 3, 6 & 7	4 & 5	-	-

### 5.3 Tree Retention Values

Determined by combining the Useful Life Expectancy and Landscape Significance Rating into the Retention Value Matrix - Appendix B, the following Retention Values were given for the 7 assessed trees.

#### Retention Value

**High** – Priority for Retention

**Medium** – Consider for Retention

**Low** – Consider for Removal

**Insignificant** – Priority for Removal

Retention Value	High	Medium	Low	Insignificant
Tree Number	1, 2*, 3, 6 & 7	4 & 5	-	-

\*Trees within neighbouring property should be retained and protected regardless of retention value

## 6.0 THE PROPOSAL

The proposed development includes:

- Construction of a new dwelling house on a vacant lot
- Landscaping

The following plans have been reviewed:

Dwg No.	Revision	Plan Name	Date	Prepared by
0422/1	-	Detail & Levels Plan	Feb 2022	YSCO Geomatics
DA100	A	Title Page	03/08/2023	PopovBass
DA101	A	Site Analysis Plan	03/08/2023	PopovBass
DA102	A	Site Plan	03/08/2023	PopovBass
DA103	A	Ground Floor Plan	03/08/2023	PopovBass
DA104	A	Level 01 Plan	03/08/2023	PopovBass
DA105	A	Roof Plan	03/08/2023	PopovBass
DA106	A	North and South Elevations	03/08/2023	PopovBass
DA107	A	East and West Elevations	03/08/2023	PopovBass
DA108	A	Section AA	03/08/2023	PopovBass
DA109	A	Section BB	03/08/2023	PopovBass
DA110	A	Colours and Material Schedule	03/08/2023	PopovBass
DA111	A	Area Diagrams	03/08/2023	PopovBass
Version 1	00	Tree Survey	2/12/2014	Paul Shearer Consulting
ASC04-DD-103	I	Landscape Plan – Tree Assessment	19/10/2016	Sym Studio
161445-1	-	Plan of Subdivision	1/2/2017	William Hamer
2016/00197302	-	Notice of Orders Made	13/12/2016	Land and Environment Court

## 7.0 TREE PROTECTION STANDARDS

This report adopts the Australian Standard 'AS4970-2009, Protection of Trees on Development Sites' as a point of reference and guide for the recommended minimum setbacks from the centre of a tree's trunk to development works.

### 7.1 Tree Protection Zone (TPZ)

The Tree Protection Zone (TPZ) is a radial distance measured from the centre of the tree trunk at 1.4 metres in height and are specified for each tree in Appendix D – Tree Impact Schedule. These have been calculated in accordance with 'AS4970-2009 - Protection of Trees on Development Sites'

The purpose of the TPZ is to ensure the tree's root area and crown area are protected during construction works. It is an area that is to be isolated from construction disturbances such as excavation, level changes, ripping of soil, trenching and movement of construction machinery, so that the tree remains viable into the future.

### 7.2 Structural Root Zone (SRZ)

The Structural Root Zone is an area which provides a trees structural stability. This is a radial distance calculated by formula  $(D \times 50) 0.42 \times 0.64$ . An SRZ should not be less than 1.5 metres.

This area should be completely restricted from construction activities unless clearly demonstrated that the works will not adversely impact on a trees stability or viability.

### 7.3 Incursion into TPZ

Encroachments into a TPZ may be possible where it is assessed by a suitable qualified AQF Level 5 Arborist and deemed to be acceptable without being detrimental to the ongoing vigour of a tree.

- Minor Encroachment of 10% or less of the TPZ area and outside of the Structural Root Zone (SRZ) is generally considered acceptable. However, the area lost should be compensated for elsewhere and only be restricted to one side of the tree. Other factor such as health, condition, age, species type and tolerance to disturbance, as well as lean and stability must also be considered when establishing if the encroachment is acceptable and won't adversely impact on the tree.
- Major Encroachment of more than 10% of the TPZ area will require detailed investigation to establish if the tree will remain viable. Such investigation should involve either root investigation or consideration of health, condition, age, species type and tolerance to disturbance, lean and stability.

## 8.0 IMPACT ASSESSMENT

### 8.1 Site Trees TPZ and SRZ Calculations

The following TPZ and SRZ calculations have been made for all trees captured within *Appendix C – Tree Assessment Schedule*. The encroachment into the TPZ of each tree has been nominated as either 'No Incursion', 'Minor', 'Major' or 'Within Footprint' based on the above criteria:

Tree No.	TPZ	SRZ	Incursion
1	10.08m	3.3m	Within Footprint
2	7.32m	2.87m	No Impact
3	10.92m	3.15m	Within Footprint
4	3.48m	2.05m	No Impact
5	8.28m	3.01m	No Impact
6	3.36m	2.25m	No Impact
7	5.4m	2.49m	No Impact

### 8.2 Proposed Development Assessment Findings

#### 8.2.1 Trees within the Footprint

The proposed development will require the removal of two (2) trees located within the footprint of the building envelope, they been Tree 1 & 3.

Tree 1: *Angophora costata* - Remove

The tree exhibits a 'Medium' ULE rating, 'High' Landscape Significance and 'High' retention values that warrants retention and major design consideration.

The tree was observed to have a large wound on the East side of the trunk with two (2) *Phellinus* fruiting bodies present both within close proximity to each other. Structural integrity of the tree is

likely to deteriorate over the short term (5 – 15 years) resulting in removal of the tree been probable.

There are no foreseeable mitigation options that exist that would allow for tree retention without a significant reduction in the building envelope, and likely rendering the parcel of land useless. Construction activities impacting the TPZ, even if reduced to an acceptable level, are likely to expediate the decline of the tree or further enable the progression of the *Phellinus*.

Removal is required should the proposed development be approved in its current format.

#### Tree 3: *Angophora costata* - Remove

Tree 3 was attributed a 'Long' ULE rating and a 'Very High' Landscape Significance resulting in 'High' retention values.

The tree is one of the best examples within the area, is visually prominent from multiple directions and offers significant canopy and amenity. The retention value warrants retention and major design consideration however, as the building envelopes have already been approved by the Land and Environment Court (*Restriction P noted on the title states, as the registered proprietor are only allowed to construct a building within the designated footprint, Condition B3 of the Notice of Orders Made, prepared by the LEC dated 13/12/16 also states trees located within the envelope of approved development areas may also be removed.*) there are no practical options that exist to retain the tree without relocating the building footprint closer to the street frontage.

Tree removal is required should the proposed development be approved in its current format.

#### **8.2.3 Trees with No Incursion**

Tree 2 is located on neighbouring property Lot 15 Knight Street and is not expected to have its TPZ encroached upon. Tree Protection Fencing as indicatively drawn up on *Appendix F: Tree Location & Protection Plan* is to be installed.

Trees 4, 5, 6 & 7 are adequately set back from the proposed development and will not be impacted by construction. Tree protection fencing is to be erected as indicatively drawn up on *Appendix F: Tree Location & Protection Plan* with sediment control traps placed at the base of the fence.

TPZ's are to be mulched and maintained at a depth of 75mm for the duration of the project.

## 9.0 RECOMMENDATIONS

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As a result of inspection and assessment of the subject trees, the following recommendations are made;

### 9.1 Tree Removal

Trees 1 & 3 are located within the proposed development footprint and will require removal to facilitate construction.

### 9.2 Tree Retention

Trees 2, 4, 5, 6, & 7 are recommended for retention.

### 9.3 Tree Protection Measures

Trees 2, 4, 5, 6 & 7 should be protected in accordance with the Australian Standards *AS4970:2009 – Protection of Trees on Development Sites, Section 8.2.3 Trees with No Incursion & Appendix B: Tree Protection (Generic)* of this report.

### 9.4 Replacement Planting

Street tree replacement planting should not occur until the completion of the development to ensure the trees have the greatest chance of success and establishment. All replacement planting must be in accordance with *AS2303:2018 Tree Stock for Landscape Use*.

Should you require any further information in relation to this report, please contact our office on:

P) 0404 524 526

E) [info@thetreeguardian.com.au](mailto:info@thetreeguardian.com.au)

M) 2/53a Park Rd, Carlton, NSW, 2218

Regards,



Tarek Hussein

Consulting Arborist

Diploma Horticulture (Arboriculture) - AQF Level 5

ISA Tree Risk Assessment Qualification (TRAQ)

AQF Certificate III in Arboriculture

AQF Certificate II in Arboriculture

Operations Manager for City of Sydney Major Tree Services Contract 2018-2021



## 10.0 LIMITATION OF LIABILITY

The Tree Guardian Arboricultural Consultants are tree specialists who use their qualifications, education, knowledge, training, diagnostic tools and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of this assessment and report.

The Tree Guardian cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways the arboriculture industry does not fully understand. Conditions are often hidden within trees and below ground. Unless otherwise stated, observations have been visually assessed from ground level. The Tree Guardian cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the scope of The Tree Guardian's services, such as property boundaries and ownership, disputes between neighbours, sight lines, landlord-tenant matters, and related incidents. The Tree Guardian cannot take such issues into account unless complete and accurate information is given prior or at the time of the site inspection. Likewise The Tree Guardian cannot accept responsibility for the authorisation or non-authorisation of any recommended treatment or remedial measures undertaken.

In the event that The Tree Guardian recommends retesting or inspection of trees at stated intervals these works must be carried out within the designated time frame. It is the client's responsibility to make arrangements with The Tree Guardian to conduct the re-inspection. Trees can be managed, but they cannot be controlled. To live or work near a tree involves a degree of risk. There is no warranty or guarantee, either expressed or implied by The Tree Guardian, that problems or deficiencies of the subject trees may not arise at a future time.

Trees are living entities. As such, their health may alter, they will grow and their environmental circumstances may change from the time of the site inspection upon which this report is based. For this reason, this report has a maximum validity time of 1 year from the date of being written. Should there be any alteration to the site, the tree or the trees immediate environment from those current at the time of the site inspection, upon which this report is based, the report will become invalid immediately.

All written reports must be read in their entirety, at no time shall part of the written assessment be referred to unless taken in full context of the whole written report. This report remains the intellectual property of The Tree Guardian. It has been issued to the identified client for the specified and agreed purpose only. Use of this report for any other purpose or by any other individual or company must have the written consent of The Tree Guardian PRIOR to that use. Failure to obtain such consent is deemed a breach of copyright and will result in legal action being undertaken against all parties involved. If this written report is to be used in a court of law or any legal situation The Tree Guardian must be advised in writing prior to the written assessment being presented in any form to any other party.

Care has been taken to obtain information from reliable sources. All data has been verified wherever possible however, The Tree Guardian can neither guarantee nor be responsible for the accuracy of information provided by others.

### References and Bibliography

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- Code of Practice - Amenity Tree Industry, 1998.
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- *State Environmental Planning Policy (Biodiversity and Conservation) 2021*
- *AS 4970:2009 - Protection of Trees on Development Sites*
- *AS 4373:2007 - Pruning of Amenity Trees,*
- *AS 2303:2018 - Tree Stock for Landscape Use*

## APPENDIX A – DEFINITIONS AND CRITERIA

**Tree ID No** A unique identification number assigned to a particular tree and used to identify it throughout the report.

**Common Name** The name in common use and accepted by most persons for that particular species.

**Botanical Name** The taxonomic name, expressed in binomial nomenclature, derived from visual identification features and visible from ground level or specimen collection.

**Height (m)** The visually estimated height of the tree in metres.

**Width N/S** = North to South; **E/W** = East to West. The visually estimated maximum width of the canopy in that direction in metres.

**Ø (m)** Diameter at Breast Height (DBH) measured at 1.4m above ground, unless otherwise noted, as outlined in AS 4970 – 2009.

**Ø @ Base (m)** Diameter at Base measured above the root flares and below the DBH as outlined in AS4970-2009.

**Health** Good (G) – In good, health with no significant health issues visible. Fair (F) – Some health issues which could be addressed by intervention. Poor (P) – Significant health issues that could be addressed by intervention. Very Poor (VP) – Significant health issues which are unlikely to be addressed by intervention. Senescent (S) – Tree has entered a cycle of decline from where it is unlikely to recover regardless of intervention.

**Structure** Good (G) – No visible defects within the structure of the tree. Fair (F) – Minor visible defects within the structure of the tree relative to the species. Poor (P) – Major visible defects within the structure of the tree relative to the species. Very Poor (VP) – Significant visible defects within the structure of the tree relative to the species.

**Form** Good (G) – A specimen that has attained its full genetic potential and with no physical or environmental impediments to growth. Fair (F) – A specimen that has generally attained its genetic potential and with some minor physical or environmental impediments to growth. Poor (P) – A specimen that has attained some of its genetic potential and with significant physical or environmental impediments to growth. Very Poor (VP) – A specimen that has not attained any of its full genetic potential due to major physical or environmental impediments to growth.

**Age** Y = Young – young tree that is yet to establish. SM = Semi-mature – an established tree but one that has not attained its full genetic potential for size and/or form. M = Mature – a tree that has attained its full genetic potential in size and/or form. OM = Over Mature – a tree that is no longer capable of further growth and/or has entered a cycle of decline.

**Canopy Cover** A visual estimation, expressed as a percentage, of the canopy present as compared to a specimen which has attained its full genetic potential and with no physical or environmental impediments to growth.

**Foliage Density** A visual estimation, and expressed as a percentage, of the level of foliage density present as compared to a specimen which has attained its full genetic potential and with no physical or environmental impediments to growth.

**Tree Protection Zone (TPZ)** A defined, radial area within which certain activities are prohibited or restricted to prevent or minimise potential injury to designated trees. Calculated using the formula outlined in AS4970-2009.

Encroachments into a TPZ may be possible where it is assessed by a suitable qualified Arborist and deemed to be acceptable without being detrimental to the ongoing vigour of a tree.

A Minor Encroachment of 10% or less of the TPZ area and outside of the Structural Root Zone (SRZ) is generally considered acceptable. However the area lost should be compensated for elsewhere and only be restricted to one side of the tree. Other factor such as health, condition, age, species type and tolerance to disturbance, lean and stability must also be considered when establishing if the encroachment is acceptable and won't adversely impact on the tree.

A Major Encroachment of more than 10% of the TPZ area will require detailed investigation to establish if the tree will remain viable. Such investigation should involve root investigation and consideration of health, condition, age, species type and tolerance to disturbance, lean and stability.

**Structural Root Zone (SRZ)** A radial area of soil around a tree where the majority of the structural roots are located and in which encroachment or activity is prohibited to prevent or minimise the potential for destabilisation of designated trees. Calculated using the formula outlined in AS4970-2009.

**Useful Life Expectancy (ULE):** A useful life expectancy has been determined for individual trees based on an assessment of current estimated age, species characteristics and potential life span, any known impacts, level of impact that the proposed development will have on the tree, species tolerance to development impacts. The ratings are:

**Long** – 40 years +

**Medium** – 15-40 years

**Short** – 5-15 years

**Transient** – less than 5 years

**Dead or hazardous (defective or unstable)**

This rating has been determined based on an assessment of the tree at the time of inspection and any information made available during the assessment. Unknown impacts or adverse actions following initial inspection of individual trees do not form part of the final ratings.

**Landscape Significance Rating:** The Landscape Significance has been determined by an assessment of the cultural, environmental and aesthetic value of individual trees. This location, amenity, visual prominence, habitat value and species type are also considered when determining the landscape significance of individual trees.

The following criteria is used when determining the Landscape Significance Rating. This rating aids with determining the Retention Value.

Landscape Significance	Description
Very High	The subject tree is listed or forms part of the description of an item listed in the NSW Heritage Act
	The subject tree is listed as or forms part of the description of a Heritage Item under the Council's Local Environmental Plan
	The subject tree is listed in Council's Register of Significant Trees
	The subject tree is remnant
High	The subject tree is considered a land mark
	The subject tree is considered to be of local, cultural or historical importance
	The subject tree forms part of an Ecological Community associated with the site as defined by the provisions of the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999.
	The subject tree has been identified as providing habitat value to a threatened or protected species.
	The subject tree is visually prominent and provides a positive contribution to the amenity and aesthetics of the area.
	The subject tree is an excellent representative of the species in terms of health, structure and form
Medium	The subject tree is of large /dominate dimensions (height and canopy spread) and provides a positive contribution to the canopy cover of the area.
	The subject tree provides a positive contribution to the amenity and biodiversity of the immediate area
	The subject tree provides a positive contribution to the visual appearance of the area
	The subject tree is a screening element, visual and/or noise buffer
	The subject tree provides present habitat value
Low	The subject tree represents the species in a positive manner in term of health, structure and form.
	The subject tree is not protected by the provisions of Council's Development Control Plan as it is less than the proscribed height or is a species listed as exempt
	The subject tree is a species considered as being an environmental weed
	The subject tree provides little to no value to the amenity or aesthetics of the area
Insignificant	The subject tree is structurally unsound or poor health which cannot be improved.
	The tree is declared a Noxious Weeds under the Noxious Weeds Act 1993
	The tree is dead

\*The above has been modified from the Tree iQ Criteria for Landscape Significance

**Tree Retention Rating:** The Retention Value has been allocated to individual trees by combining the Useful Life Expectancy and Landscape Significance Rating into the Matrix below to give a Retention Value of High, Medium or Low.

		LANDSCAPE SIGNIFICANCE				
		Very High	High	Medium	Low	Insignificant
Useful Life Expectancy	Long					
	Medium					
	Short					
	Transient					
	Dead/Hazard					

**High:** Warrants retention and major design consideration (modification of footings, building alignment etc)

**Medium:** Warrants retention and minor design consideration (effort should be made to retain these trees wherever possible).

**Low:** These trees should not be considered to be a constraint to design layout. These trees should be removed irrespective of any proposed development.

**Insignificant:** These trees should not be considered to be a constraint to design layout. These trees should be removed irrespective of any proposed development.

## APPENDIX B – TREE PROTECTION (GENERIC)

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### **TREE PROTECTION**

All trees, other than those indicated on the drawings to be removed, shall be protected at all times during construction in accordance with the Australian Standard 4970 - 2009 *Protection of Trees on Development Sites*.

All works shall be undertaken in accordance with the Tree Protection Plan and the following tree protection specifications, unless otherwise directed by the Principal's representative or the appointed Project Arborist.

### **PROJECT ARBORIST**

A Project Arborist, with minimum AQF Level 5 qualifications, shall be appointed prior to the commencement of any construction activities. The Project Arborist will be responsible for specifying, monitoring and certification of all tree protection measures for any activities proposed around existing trees located within the limit of the construction.

The Contractor shall provide site access to the Project Arborist at all times. The Project Arborist may provide advice on the existing trees, however all communications will be formalised between the Contractor and the Principal's representative.

### **SITE INDUCTION**

The Principal's Representative, Project Arborist, Contractor and any other persons required to work within the Tree Protection Zone (TPZ) of any trees shall attend a site induction meeting before any machinery or materials are brought onto the site and before the commencement of any site works including demolition, earthworks or site clearing.

The Tree Protection Measures, including the location of tree protection fencing, site sheds, stockpile areas, temporary access roads, sediment control devices and any drainage works shall be confirmed during the site induction meeting.

The site induction will highlight the requirements to protect the trees within the site, the type of actions that could lead to potential damage and the penalties imposed by Council for breach of the tree protection measures.

### **TREE PROTECTION FENCING**

Prior to the commencement of any construction activities, install a Tree Protection Fence around individual trees or group of trees at the nominated TPZ distances specified on the Tree Protection Plan. Where TPZ merge together a single fence encompassing a group of trees is suitable. The fencing shall define and restrict entry into the TPZ. The fencing shall conform to the following:

- Fencing shall be a minimum of 1.8m steel galvanised chain wire fencing with lockable gates to AS 1725 and clad with shade cloth to prevent wind-blown debris entering the TPZ;
- The fencing shall be set / fixed into concrete blocks. The fencing must not be secured with posts driven into the ground;
- The area within the TPZ fencing shall be kept free of weeds and grass for the duration of project;
- Mulch shall be installed and maintained to a depth of 75mm for the duration of project

The TPZ fencing shall be erected by the Contractor and approved by the Project Arborist before any machinery or materials are brought onto the site and before the commencement of any works including demolition.

**TPZ SIGNAGE**

A sign (600mm x 400mm) identifying the name and contact details of the Project Arborist shall be attached to the protective fencing of each TPZ. Below is a sample signage for use:

**PROHIBITED ACTIVITIES**

The following activities are prohibited within the TPZ;

- Excavation, trenching (unless approved by and under the direct supervision of the Project Arborist)
- Ripping and cultivation
- Mechanical removal of vegetation
- Soil disturbance or movement of natural rock
- Soil changes including placement of fill (unless approved by and under the supervision of the Project Arborist)
- Movement and storage of plant, equipment and vehicles including machinery washing, repairs and refuelling
- Erection of site offices or sheds including portable toilets
- Affixing of signage or hoardings to trees
- Stockpiling, storage and mixing of materials including storage of waste materials, disposal of waste materials and chemicals including paint, solvents, cement slurry, fuel, oil and any other toxic liquids
- Physical damage to canopies, trunk or root systems
- Any activity likely to cause damage to any tree

**TREE TRUNK PROTECTION**

Trunk protection will be required where works have been approved within the TPZ. As a minimum, the trunk protection shall consist of wrapping of trunks with hessian and two-metre lengths of hardwood timber planks (100 x 50mm) spaced at 100-150mm intervals strapped around the trunk and secured with 2mm galvanised wire. The hessian and timber planks must not be fixed to the tree in any fashion or in any instance.

**GROUND PROTECTION**

Ground protection must be installed within the TPZ in the event that temporary access for machinery is required and has been approved by the Project Arborist. The ground protection is required to prevent root damage and soil compaction from occurring within the TPZ.

The ground protection shall include a permeable membrane such as geotextile fabric beneath a 100mm layer of mulch below rumble boards of a suitable thickness to prevent soil compaction and root damage from occurring during the movement of any machinery within the TPZ.

**EXCAVATIONS WITHIN TPZ**

Any excavations undertaken within the TPZ which have been approved by the Project Arborist shall be undertaken using non-destructive methods (such as by hand or with an Airspade) to ensure no tree roots greater than 40mm diameter are damaged, pruned or removed.

In the event that any roots greater than 40mm diameter are located during excavation, further advice shall be obtained by the Project Arborist before further works continues where the root has been identified.

Root pruning must not be undertaken without prior approval from the Project Arborist.

**CANOPY AND/OR ROOT PRUNING**

Care shall be taken when operating heavy machinery near trees to avoid damage to tree canopies

(foliage and branches). The Project Arborist shall be contacted if there is potential conflict between tree canopies and construction activities (including machinery).

Any canopy or root pruning required shall be undertaken in accordance with AS 4373-2007 *Pruning of Amenity Trees*, under the direct supervision of the Project Arborist.

Where root pruning is required, roots shall be severed at the face of the excavation by hand using clean, sharp pruning implements. All excavations within the TPZ of any tree/s shall be undertaken under the supervision of the Project Arborist.

**TREE ROOT PROTECTION**

Temporary root protection, including hessian or similar biodegradable material, shall be installed under the supervision of the Project Arborist to prevent roots from drying out, where roots are exposed during demolition or construction works.

**SERVICES**

Where trenching works are required for any services / hydraulics / drainage etc. this shall not be undertaken within any TPZ. The Project Arborist shall be contacted if any works are required within the TPZ.

Alternative installation methods for services, such as directional boring/drilling, or redirection of services shall be employed where large woody roots greater than 50mm diameter are encountered during the installation of any services adjacent to the specified TPZ.

**TREE DAMAGE**

In the event that any tree is damaged during construction, the Project Arborist shall be notified as soon as possible to inspect and provide advice for remedial action that may minimise any adverse impact.

**EXAMPLE FENCING, PROTECTION AND SIGNAGE:**

<p>Figure 2 – Protective Fencing</p>	<p>Figure 3 - Tree Protection Zone Signage</p>
<p>Figure 4 - Trunk, Branch &amp; Ground Protection</p>	<p>Figure 5 - Indicative Scaffolding within a TPZ</p>

## APPENDIX C – TREE ASSESSMENT SCHEDULE

Tree No.	Species Name	Height (m)	Spread (m)	DBH (mm)	DARB (mm)	Age	Health	Structure	Form	Comments
1	<i>Angophora costata</i>	16	18	840	990	M	Good	Fair	Good	See below
<p><b>Comments:</b> Tree will incur major encroachment from proposed development. The tree includes an East side wound measuring 2mL x 0.6m W, 2 x Phellinus fruiting bodies observed on wound within close proximity to each other.</p>										
2	<i>Angophora costata</i>	15	9	670	710	M	Good	Good	Fair	Asymmetrical canopy lean to North, minor basal wound.
3	<i>Angophora costata</i>	17	17	910	890	M	Good	Good	Good	Very high significance, minor deadwood, early stages of target canker.
4	<i>Angophora costata</i>	11	6	290	320	SN	Fair	Good	Fair	Suppressed by Tree 5, deadwood.
5	<i>Eucalyptus botryoides</i>	17	14	690	800	M	Fair	Fair	Fair	Deadwood, low RL, mild borer.
6	<i>Angophora costata</i>	14	7	280	400	M	Good	Good	Good	-
7	<i>Angophora costata</i>	14	8	450	510	M	Good	Good	Good	-

## APPENDIX D – TREE IMPACT SCHEDULE

Tree No.	Species Name	TPZ (m)	SRZ (m)	ULE	Landscape Significance	Retention Value	Proposed Action	Development Impacts
1	<i>Angophora costata</i>	10.08	3.3	Medium	High	High	Remove	Within footprint
2	<i>Angophora costata</i>	7.32	2.87	Long	High	High	Retain*	No Impact.
3	<i>Angophora costata</i>	10.92	3.15	Long	Very High	High	Remove	Within footprint
4	<i>Angophora costata</i>	3.48	2.05	Long	Medium	Medium	Retain	No Impact.
5	<i>Eucalyptus botryoides</i>	8.28	3.01	Medium	Medium	Medium	Retain	No Impact.
6	<i>Angophora costata</i>	3.36	2.25	Long	High	High	Retain	No Impact.
7	<i>Angophora costata</i>	5.4	2.49	Long	High	High	Retain	No Impact.

\*Trees within neighbouring property should be retained and protected regardless of retention value

## APPENDIX E – PHOTOS



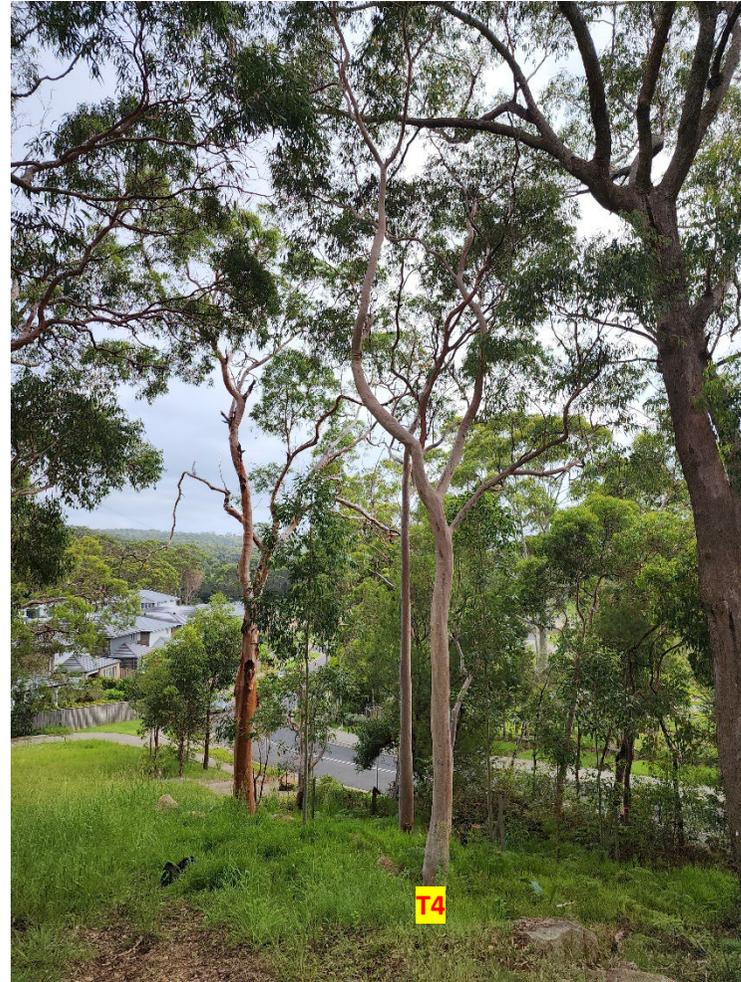
**Photo 1:** Trees 1 & 3, taken facing North



**Photo 2:** Tree 3 very high landscape significance



**Photo 3:** Tree 2 located on neighbouring Lot 15 - Taken facing West



**Photo 4:** Tree 4 taken facing Northeast



**Photo 5:** Trees 4 & 5 to be retained - Taken facing East



**Photo 6:** Trees 6 & 7 to be retained - Taken facing Southeast

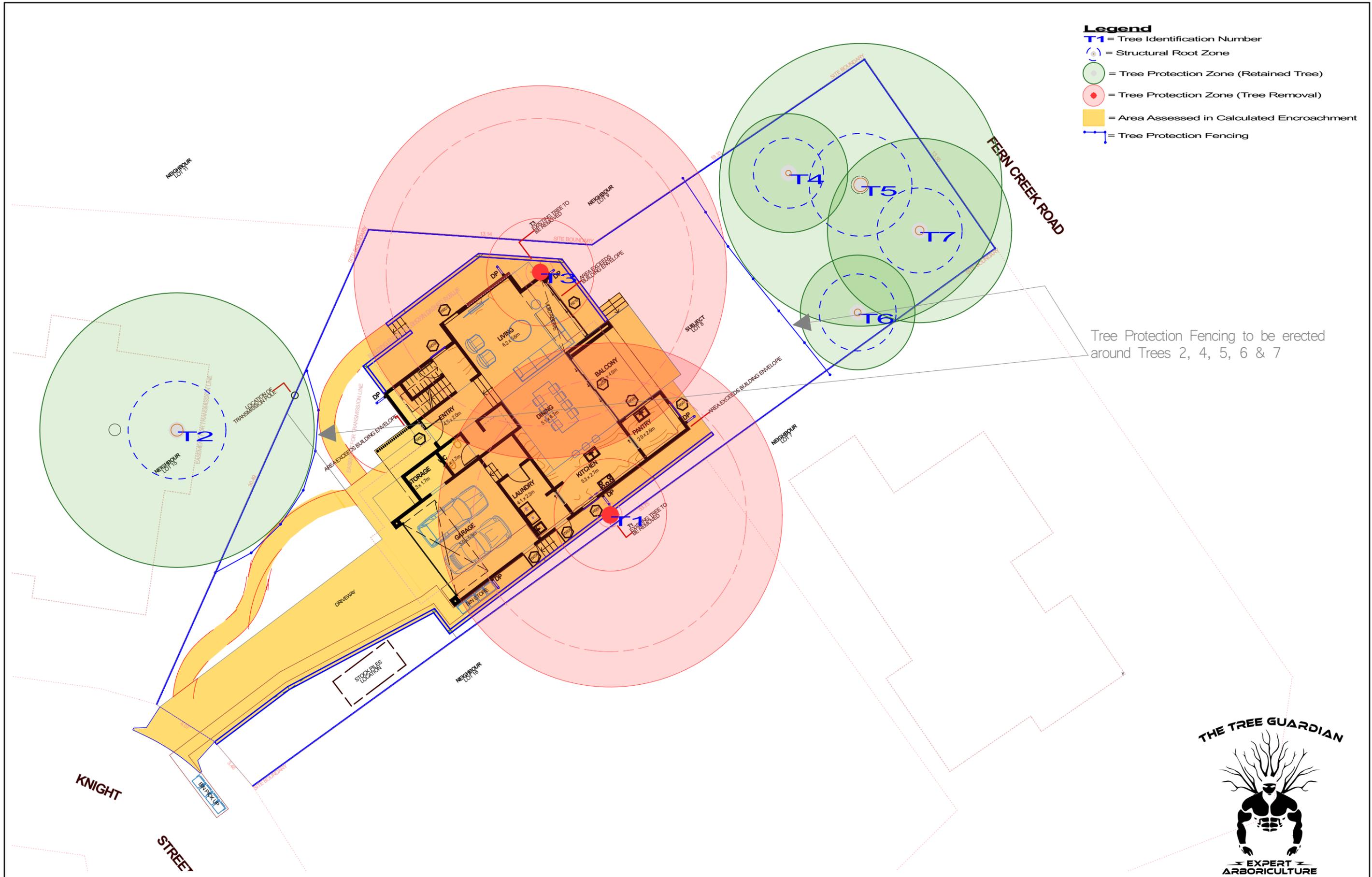
## APPENDIX F – PLANS

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### Plan 1 - Tree Location & Protection Plan

**Legend**

- T1 = Tree Identification Number
- (⊕) = Structural Root Zone
- = Tree Protection Zone (Retained Tree)
- = Tree Protection Zone (Tree Removal)
- = Area Assessed in Calculated Encroachment
- = Tree Protection Fencing



Tree Protection Fencing to be erected around Trees 2, 4, 5, 6 & 7



<p><b>The Tree Guardian Group Pty Ltd</b> 2/53A Park Rd, Carlton, NSW, 2218</p> <p>E: info@thetreeguardian.com.au M: 0404 524 526</p>	<p>CLIENT: SEKISUI HOUSE</p>	<p>DRAWN: T.H</p>	<p>TITLE/DWG NO. TREE LOCATION &amp; PROTECTION PLAN</p> <p>8 KNIGHT STREET, WARRIEWOOD, NSW, 2102</p>	<p>REVISION: B</p>	<p><b>A3</b></p>
		<p>DATE: 13.08.2023</p>			
		<p>SCALE: 1:200 A3</p>			