



# **Arboricultural Impact Assessment Report & Tree Protection Specification**

**167 Riverview Road, Avalon Beach**

**Prepared for  
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## 2.0 INTRODUCTION

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This report was commissioned by Mr Simon Ehrlich to accompany his Development Application for the construction of a new driveway extension and building extension at 167 Riverview Road, Avalon Beach.

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 (Vegetation in Non-Rural Areas) 2017*, *Pittwater 21 Development Control Plan (DCP)* and the *Australian Standards AS4970 'Protection of trees on development sites* and information published on Northern Beaches website in relation to removing and pruning trees on private land.

## 3.0 METHODOLOGY

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An assessment of any tree contained 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 measuring tape was used to establish the trunk Diameter at Breast Height (DBH) and is recorded in millimetres.

An iPhone was used for the purpose of providing photographic evidence and cross reference by person/s who has 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 Rot Zone (SRZ) has been calculated in accordance with the Australian Standard 4970-2009 'Protection of trees on development sites'.

## 4.0 SITE DESCRIPTION

The subject site is a residential dwelling known as 167 Riverview Road, Avalon Beach. The subject site is rectangular with a foreshore frontage onto Pittwater and is approximately 1600m<sup>2</sup> in land size.

The site land is zoned category E4: Environmental Living pursuant to the *Pittwater Local Environmental Plan (PLEP) 2014* and is legally defined as Lot 102, Deposit Plan 803977.

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.



**Image 1:** Aerial view of subject site (source: SIX Maps)

### 4.1 Legislation and Planning Controls

The following legislative and planning controls apply to the subject property in relation to trees;

- *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017*
- *Pittwater 21 Development Control Plan (DCP)*

This report has also reviewed information published on Northern Beaches website in relation to removing and pruning trees on private property to ascertain species listed as exempt.

## 5.0 OBSERVATIONS

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A total of 12 trees were inspected on the 19 November 2021. Each tree has been provided with an identification number for reference purposes denoted on Plan 1 - Tree Retention and Removal Plan (Appendix E).

The general health and condition of the trees has been assessed as being of good to poor health. The condition of trees is good through to poor. Individual assessment findings are detailed in Appendix C - Tree Assessment Schedule.

Trees 1, 2 and 3 have been identified as Spotted Gums (*Corymbia maculata*) located at the front of the property on Council land. The trees have been noted in fair to poor health with moderate to major deadwood throughout their canopy. All trees are showing signs of drought related stress with sparse canopies and epicormic growth. The condition of the trees range from good to poor. The trees have been rated as having Low to Medium Landscape Significance, with a remaining life expectancy of 5-15 years giving them Low Retention Values.

Tree 4 has been identified as a Tree of Heaven (*Ailanthus altissima*) located at the front of the property on Council land. This species is listed as an exempt species on the Northern Beaches website. The tree has been rated as having Low Landscape Significance, with a remaining life expectancy of 40+ years giving it a Low Retention Value.

Tree 5 has been identified as a Tuckeroo (*Cupaniopsis anacardioides*) located at the front of the property on Council land. This species is listed as an exempt species on the Northern Beaches website. The tree has been rated as having Low Landscape Significance, with a remaining life expectancy of 40+ years giving it a Low Retention Value.

Tree 6 has been identified as a Grey Iron Bark (*Eucalyptus paniculata*) located at the front of the property. The tree was noted in good health and condition. The tree is a self-sown specimen which is suppressed by Trees 2 and 3. The tree has been rated as having a Low Landscape Significance with a remaining life expectancy of 15-40 years, giving it a Low Retention Value.

Tree 7 and 8 have been identified as Cabbage-tree palms (*Livistona australis*) located on the southern side of the property behind the main dwelling. The palms are under 5 metres in height. Therefore they are not protected by Council's DCP. As such regardless of the development, these trees can be removed.

Tree 9 has been identified as a Spotted Gum (*Corymbia maculata*) located on the southern side of the property directly behind the main dwelling. The tree was noted in good health and condition. The tree has been rated as having a High Landscape Significance with a remaining life expectancy of 40+ years, giving it a High Retention Value.

Tree 10 has been identified as a Silky Oak (*Grevillea robusta*) located in the south-western garden area of the property. This species is listed as an exempt species on the Northern Beaches website. As such regardless of the development, this tree can be removed.

Tree 11 has been identified as a Spotted Gum (*Corymbia maculata*) located in the south-western garden area of the property. This tree was noted in poor health and fair condition. The tree has an asymmetrical canopy, has been heavily pruned in the past, and has multiple small cavities, with a declining canopy. The tree has been rated as having a Low Landscape Significance with a remaining life expectancy of 5-15 years, giving it a Low Retention Value. This tree is recommended for removal regardless of the proposed development.

Tree 12 has been identified as a Cabbage-tree Palm (*Livistona australis*) located on the southern side of the property behind the main dwelling. The palm is in good health and condition. The palm has been rated as having a Medium Landscape Significance with a remaining life expectancy of 40+ years, giving it a Medium Retention Value.

## 6.0 THE PROPOSAL

The proposed development includes:

- Construction of a suspended concrete driveway.
- Alteration and additions including two new bedrooms with ensuites and decking on the south-western side of the dwelling.

The following plans have been reviewed:

Dwg No.	Plan Name	Prepared by	
Ref 79619	Plan Showing Detail & Levels (Sheet 1 & 2)	Rygate & Company Pty Ltd	14/6/2021
EHRL_100 rev 4	Site/Roof Plan	Yoram Shabat Architect	29/11/2021
EHRL_110 rev 2	Floor Plans	Yoram Shabat Architect	29/11/2021
EHRL_121 rev 0	Driveway Turning Deck Plan	Yoram Shabat Architect	14/10/2021
EHRL_200 rev 2	Plan Sections	Yoram Shabat Architect	29/11/2021
EHRL_300 rev 2	Elevations	Yoram Shabat Architect	29/11/2021

## 7.0 TREE PROTECTION STANDARDS

This report adopts 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 measure from the centre of the tree trunk at 1.4 metres height and are specified for each tree in Appendix D – Tree Impact Schedule. These have been calculated in accordance with AS 4970 – Protection of trees on development sites.

The purpose of the TPZ is to ensure the trees 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  $(D \times 50)0.42 \times 0.64$ . A 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 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, 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 further 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 protected trees. Trees exempt from Council's DCP have been excluded from the table. The encroachment into the TPZ of each tree has been nominated as either 'Minor' or 'Major' based on the above criteria:

Tree No.	SRZ	TPZ	Incursion
1	3.4 metres	9.6 metres	Minor Encroachment
2	3.2 metres	8.4 metres	Minor Encroachment
3	2.3 metres	5.4 metres	Minor Encroachment
6	1.7 metres	1.8 metres	Major Encroachment
9	2.8 metres	7.3 metres	Major Encroachment
12	n/a	3 metres	Minor Encroachment

### 8.2 Proposed Development Assessment Findings

The proposed development will require the removal of three (3) trees which are located within the footprint of the new driveway extension. These trees are numbered Tree 4, 5 and 6 and are either exempt species or rated as having Low Retention Values.

The proposed development will require the removal of three (3) trees located within the footprint of the building extension works. These trees are numbered Tree 7, 8 and 10 and are either not protected by Council's DCP or listed as exempt species.

The supplied plans indicate that Tree 1, 2 and 3 will be the subject of a Major Encroachment in terms of surface area coverage by the proposed driveway extension. However due to the nature of the land being 2-3 metres lower in the front yard than the roadway levels, the driveway will be a suspended concrete slab on localised pier footings, making the encroachment into the TPZ for these trees a minor encroachment. Tree sensitive construction methods in accordance with Section 10 below, will be required during construction to ensure these trees remain viable.



The supplied plans indicate that Tree 9 will be the subject of a Major Encroachment in terms of surface area coverage by the proposed building extension. This tree is located in the middle of the proposed new building extension. However the building will be constructed on pier footings reducing the overall incursion to a Minor Encroachment in terms of below ground impacts. To avoid impact on this tree, tree sensitive construction methods in accordance with Section 10 below should be implemented during the works.

The supplied plans indicate tree 12 will also be the subject of a Major Encroachment. However this has been identified as a palm tree with a fibrous root system, restricted by the surrounding garden area. As such the rootball is approximately 1 metre in diameter and is not expected to be impacted by the proposed development if pier footings are positioned at least 1 metre outside of the rootball.

## 9.0 RECOMMENDATIONS

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### 9.1 Tree Retention

Trees 1, 2, 3, 9 and 12 are recommended for retention.

Trees 1, 2, 3, 9 and 12 are to be protected in accordance with Section 10 and Appendix B.

### 9.2 Tree Removal

Tree 4, 5 and 6 are located within the footprint of the driveway extension and will require removal.

Tree 7 and 8 are not protected by Northern Beaches Tree Policy and can be removed regardless of the proposed development.

Tree 10 is exempt from Northern Beaches Tree Policy and can be removed regardless of the proposed development.

Tree 11 is recommended for removal due to poor health and fair condition.

Should you require any further information in relation to this report, please contact our office on 0404 524 526



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## 10.0 RECOMMENDED TREE PROTECTION MEASURES

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**All trees** to be retained are to be protected in accordance with “*Australian Standard 4970 – 2009 Protection of Trees on Development Sites (AS4970-2009)*” and specific recommendations detailed within this report.

### 10.1 Tree Protection Plan

Prior to the commencement of any construction activities a Tree Protection Plan should be prepared outlining Tree Protection Fencing locations and Tree Trunk Protection measures required to be implemented during construction in accordance with the Australian Standard 4970 - 2009 *Protection of Trees on Development Sites*.

### 10.2 Prohibited Activities

The following activities are to be prohibited within the TPZ;

- Excavation, trenching (with the exception of approved localised pier footings and/or 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

### 10.3 Excavation for footings within Tree Protection Zones

Prior to any mechanical excavations for the driveway or building foundations within the Tree Protection Zone of Tree listed for retention, exploratory excavation using non-destructive techniques shall be undertaken at the footing location where they are within the TPZ. Non-destructive excavation techniques may include the use of handheld implements, air pressure (using an Air-spade® device) or water pressure. The exploratory excavation shall be undertaken along the perimeter of the foundation (within the TPZ) to the depth of the foundation or to a maximum of 600mm from surface levels, to locate and expose any woody roots prior to any mechanical excavation.

All care shall be undertaken to preserve woody roots intact and undamaged during exploratory excavation. Any roots encountered of less than 50mm in diameter may be cleanly severed with clean sharp pruning implements at the face of the excavation. The root zone in the vicinity of the excavation shall be kept moist following excavation for the duration of construction to minimise moisture stress on the tree.

Where large woody roots (greater than 50mm diameter) are encountered during exploratory excavations, further advice from a qualified arborist shall be sought prior to severance. Where necessary, (to avoid severing large woody roots) consideration should be given to the installation of an elevated structure (e.g. pier and beam footing, suspended slab or floor supported on piers,

cantilevered slab, up-turned edge beam etc) in preference to structures requiring a deep edge beam or continuous perimeter strip footing. The beam section of any pier and beam footing should be placed above grade to avoid excavation within the SRZ. Pier footings intersecting large woody roots should be slightly offset where necessary to avoid root severance.

Footings should be relocated where any roots greater than 50mm in diameter are encountered and are not able to be pruned or removed without adversely impacting on the tree to be retained.

#### **10.4 Underground 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.

## 11.0 LIMITATION OF LIABILITY

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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.

## 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 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
	The subject tree is of large /dominate dimensions (height and canopy spread) and provides a positive contribution to the canopy cover of the area.
Medium	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
	The subject tree represents the species in a positive manner in term of health, structure and form.
Low	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
	The subject tree is structurally unsound or poor health which cannot be improved.
Insignificant	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.

Useful Life Expectancy		LANDSCAPE SIGNIFICANCE						
		Very High	High	Medium	Low	Insignificant		
	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.

## 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**

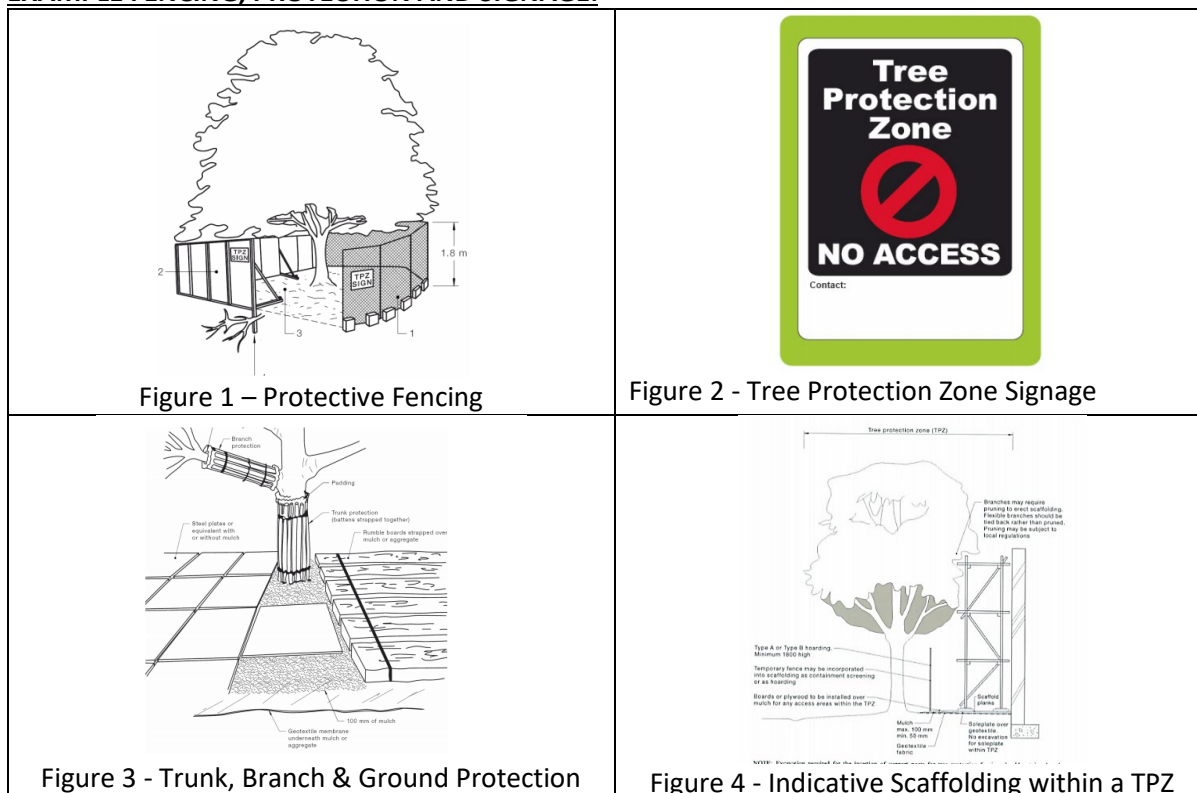
Where trenching works are required for any services / hydraulics / drainage etc. this shall not be undertaken within any TPZ. The Project Arborist shall be contacted if any works are required within the TPZ.

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:**



## APPENDIX C – TREE ASSESSMENT SCHEDULE

Tree No.	Species Name	Height (m)	Spread (m)	DBH (mm)	DARB (mm)	Age	Health	Structure	ULE	Landscape Sig.	Comments
1	<i>Corymbia maculata</i>	15	8	800	1000	M	P	F	Short	M	Major deadwood, dieback, epicormic growth, signs of drought stress
2	<i>Corymbia maculata</i>	16	9	700	900	M	F	G	Short	M	Moderate deadwood, moderate lean, suppressed by T1, signs of drought stress
3	<i>Corymbia maculata</i>	16	8	450	400	M	P	P	Transient	L	Major deadwood, 50% dieback, trunk wound @ 2m, suppressed by T2, signs of drought stress
4	<i>Ailanthus altissima</i>	6	4	EXEMPT							Tree species is exempt from Northern Beaches Tree Policy
5	<i>Cupaniopsis anacardioides</i>	6	2	EXEMPT							Tree species is exempt from Northern Beaches Tree Policy
6	<i>Eucalyptus paniculata</i>	7	3	150	180	SM	G	G	Medium	L	Suppressed, self-sown
7	<i>Livistona australis</i>	4	3	EXEMPT							Tree height is not protected by Northern Beaches Tree Policy
8	<i>Livistona australis</i>	2	2	EXEMPT							Tree height is not protected by Northern Beaches Tree Policy
9	<i>Corymbia maculata</i>	18	10	605	670	SM	G	G	Long	H	Asymmetrical canopy, minor deadwood, slight lean towards dwelling (15%), previous building clearance pruning
10	<i>Grevillea robusta</i>	13	3	EXEMPT							Tree species is exempt from Northern Beaches Tree Policy

Tree No.	Species Name	Height (m)	Spread (m)	DBH (mm)	DARB (mm)	Age	Health	Structure	ULE	Landscape Sig.	Comments
11	<i>Corymbia maculata</i>	15	5	480	570	SM	P	F	Short	L	Asymmetrical canopy, heavily pruned in past, multiple small cavities, declining canopy, small deadwood
12	<i>Livistona australis</i>	11	2	300	350	SM	G	G	Long	M	Dead fronds, good specimen, restricted rootball

## APPENDIX D – TREE IMPACT SCHEDULE

Tree No.	Species Name	DBH (mm)	DARB (mm)	SRZ (m)	TPZ (m)	TPZ Area (m <sup>2</sup> )	Retention Value	Comments
1	<i>Corymbia maculata</i>	800	1000	3.4	9.6	290	LOW	Suspended driveway extension within SRZ and TPZ - tree sensitive construction required. All excavations for footings to be undertaken by hand and relocated if tree roots greater than 50mm diameter are uncovered
2	<i>Corymbia maculata</i>	700	900	3.2	8.4	222	LOW	Suspended driveway extension within SRZ and TPZ - tree sensitive construction required. All excavations for footings to be undertaken by hand and relocated if tree roots greater than 50mm diameter are uncovered
3	<i>Corymbia maculata</i>	450	400	2.3	5.4	92	LOW	Suspended driveway extension within SRZ and TPZ - tree sensitive construction required. All excavations for footings to be undertaken by hand and relocated if tree roots greater than 50mm diameter are uncovered
4	<i>Ailanthus altissima</i>	EXEMPT						Remove - exempt species
5	<i>Cupaniopsis anacardioides</i>	EXEMPT						Remove - exempt species
6	<i>Eucalyptus paniculata</i>	150	180	1.7	1.8	10	LOW	Remove - within footprint of driveway
7	<i>Livistona australis</i>	EXEMPT						Remove - not protected
8	<i>Livistona australis</i>	EXEMPT						Remove - not protected
9	<i>Corymbia maculata</i>	605	670	2.8	7.3	166	HIGH	New building within SRZ and TPZ - tree sensitive construction required. All excavations for footings to be undertaken by hand and relocated if tree roots greater than 50mm diameter are uncovered
10	<i>Grevillea robusta</i>	EXEMPT						Remove - exempt species
11	<i>Corymbia maculata</i>	480	570	2.7	5.8	104	LOW	New building within SRZ and TPZ - poor health and condition. Tree is recommended for removal
12	<i>Livistona australis</i>	300	350	n/a	3	41	MEDIUM	New building within SRZ and TPZ - tree sensitive construction required. All excavations for footings to be undertaken by hand and relocated if tree roots greater than 50mm diameter are uncovered

## **APPENDIX E – PLANS**

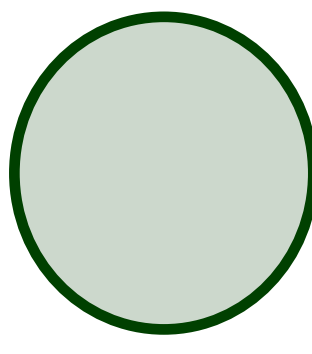
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### **Plan 1 - Tree Retention and Removal**

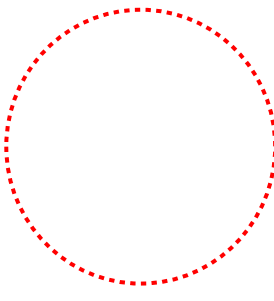
### **Plan 2 - Tree Protection Zone and Structural Root Zone**



LEGEND



Tree to be Retained



Tree to be Removed



Tree identification number

GDA2020

NOTES:

BEARINGS SHOWN RELATE TO M.G.A. NORTH.  
LIMITED BOUNDARY SURVEY MADE. IF ANY CONSTRUCTION IS INTENDED IN THE PROXIMITY OF THE BOUNDARIES IT IS RECOMMENDED THAT A FURTHER SURVEY BE REQUESTED FOR THE MARKING OF THE RELEVANT BOUNDARIES.  
CONSTRUCTION WORKS MUST BE RELATED TO THE SITE BENCH MARK AND NOT LEVELS OF STRUCTURES SHOWN ON THE PLAN.

INFORMATION SHOWN ON THE PLAN OF THE ADJOINING PROPERTIES HAS BEEN OBTAINED BY REMOTE SURVEY METHODS FROM WITHIN SUBJECT LAND AND STREET - RESTRICTED VISIBILITY ALONG THE NORTHERN AND SOUTHERN BOUNDARIES OF THE SUBJECT LAND HAS PREVENTED DIRECT MEASUREMENTS TO THE ADJOINING BUILDINGS.

TREE SPREADS & TRUNK DIAMETERS SHOWN ARE DIAGRAMMATIC ONLY AND TREE HEIGHTS ARE ESTIMATED. IF ANY OF THESE ELEMENTS ARE CRITICAL TO DESIGN (IN PARTICULAR DRIPLINES) MORE SPECIFIC DETAILS SHOULD BE REQUESTED FOR ACCURATE LOCATION.

SYMBOLS REPRESENTING SERVICE PITS, POLES AND STREET FURNITURE ARE NOT TO SCALE.

PIT SIZE IS SHOWN AT GROUND LEVEL. PITS MAY BE LARGER BELOW THE SURFACE.

SERVICE LINES SHOWN ARE DIAGRAMMATIC ONLY AND DO NOT REPRESENT THE WIDTH AND NUMBER OF CABLES OR PIPES IN THE GROUND.

POSITION OF UNDERGROUND SERVICES PLOTTED FROM INFORMATION SUPPLIED BY THE RELEVANT AUTHORITIES AND MAY BE APPROXIMATE ONLY.

IT IS THE RESPONSIBILITY OF EACH CONTRACTOR AND/OR CONSULTANT TO CONTACT THE RELEVANT AUTHORITY AND/OR "Dial Before You Dig" (Phone 1100 Fax 1300 652 077) BEFORE COMMENCING ANY EXCAVATION.

THIS PLAN HAS BEEN CREATED AT A SCALE OF 1:100 AND MAY NOT BE SATISFACTORY FOR OTHER PURPOSES. THE ACCURACY OF ANY ENLARGEMENT OR OTHER REPRODUCTION MAY BE LESS THAN THAT OF THE ORIGINAL.


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LEGEND

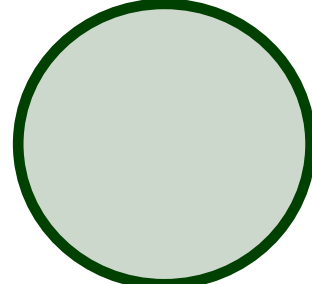
- ELECTRICITY PIT
- ELEC. POLE WITH LIGHT
- ELECTRICITY POLE
- TRAFFIC SIGNAL
- GAS METER
- GAS VALVE
- POLE (UNSPECIFIED)
- PIT (UNSPECIFIED)
- MANHOLE (UNSPECIFIED)
- TELECOM PIT
- TELECOM PILLAR
- WATER METER
- WATER VALVE
- STOP VALVE
- HYDRANT
- STORMWATER ORATE
- STORMWATER MANHOLE
- SEWER PIT
- SEWER MANHOLE
- SEWER MANHOLE
- BOLLARD
- SIGN
- UNDERGROUND ELECTRICITY
- OVERHEAD POWER LINES
- UNDERGROUND GAS
- UNDERGROUND SEWER
- UNDERGROUND STORMWATER PIPE
- UNDERGROUND STORMWATER
- UNDERGROUND WATER
- TELECOMMUNICATIONS
- ROADS & MARITIME SERVICES
- SYDNEY TRANS
- RAILCORP

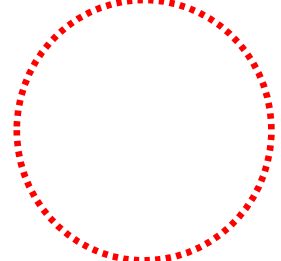



B	13-10-2021	ADDITIONAL DETAIL & LEVELS	
A	23-06-2021	SLIPWAY RAILS UPDATED	
REV.	DATE	AMENDMENTS	
		<div><div>Rygate &amp; Company Pty Limited</div><div>P.W. Rygate &amp; West</div><div>ABN 61 001 204 897</div></div> <div><div>SURVEYING SINCE 1983</div><div><div>Suite 904 Level 9, 89 York St</div><div>Sydney NSW 2000</div><div>p +61 2 9262 6800</div><div>f +61 2 9262 6843</div><div>e surveys@rygate.com.au</div><div>w rygate.com.au</div></div></div>	
SUBDIVISION   STRATA PLANS   STRATUM SUBDIVISION   LEASE PLANS   TOPOGRAPHIC SURVEYS   GPS SURVEYS   3D MODELLING   RACECOURSE DESIGN   PROJECT MANAGEMENT   SUN SHADOW DIAGRAMS			
SURVEYOR	DRAWN	CHECKED	APPROVED
A.C.	S.K.	A.C.	G.J.F.
0		10	
REDUCTION RATIO		1:100 @ B1	
DATUM : AUSTRALIAN HEIGHT DATUM			
CONTOUR INTERVAL : 0.5 METRE			
ORIGIN OF LEVELS : P.M.60565			
R.L.37.145 A.H.D.			
THIS TITLE BLOCK AND NOTES FORM AN INTEGRAL PART OF THE PLAN AND MUST BE REPRODUCED IN ANY USE, DUPLICATION OR AMENDMENT.			
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SIMON EHRLICH			
LOCALITY			
CLAREVILLE			
L.G.A.			
NORTHERN BEACHES			
PLAN			
SHOWING DETAIL & LEVELS			
LOT 102 D.P.803977			
No.167 RIVERVIEW ROAD			
CAD REFERENCE			
79619 Rev B.DGN			
REFERENCE No.	PLAN No.	DATE	SHEET No. 1
79619		14/06/2021	OF 2 SHEETS

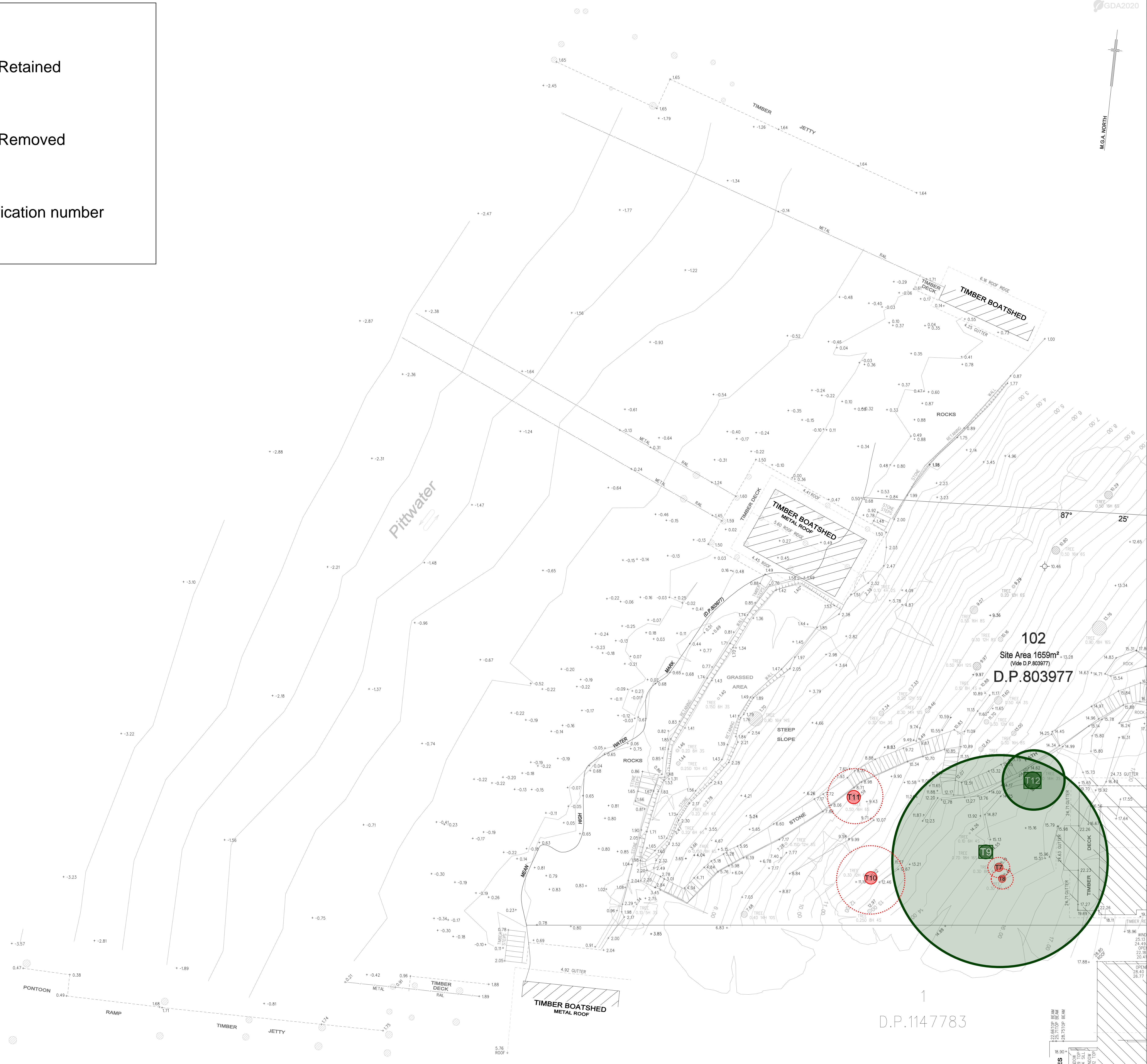


# LEGEND

 Tree to be Retained

 Tree to be Removed

 Tree identification number



**NOTES:**

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## LEGEND

⚡	ELECTRICITY PIT	E	UNDERGROUND ELECTRICITY
⚡	ELECTRICITY POLE WITH LIGHT	E	OVERHEAD POWER LINES
⚡	ELECTRICITY POLE	—	UNDERGROUND GAS
⚡	TRAFFIC SIGNAL	S	UNDERGROUND SEWER
⚡	GAS METER	—	UNDERGROUND STORMWATER PIPE
⚡	GAS VALVE	SW	UNDERGROUND STORMWATER
⚡	POLE (UNSPECIFIED)	W	UNDERGROUND WATER
⚡	PIT (UNSPECIFIED)	T	TELECOMMUNICATIONS
⚡	MANHOLE (UNSPECIFIED)	RMS	ROADS & MARITIME SERVICES
⚡	TELECOM PIT	ST	SYDNEY TRAINS
⚡	TELECOM PILLAR	RC	RAILCORP
⚡	WATER METER		
⚡	WATER VALVE		
⚡	STOP VALVE		
⚡	HYDRANT		
⚡	STORMWATER GRATE		
⚡	STORMWATER MANHOLE		
⚡	STORMWATER PIT		
⚡	SEWER PIT		
⚡	SEWER MANHOLE		
⚡	BOLLARD		
⚡	SIGN		

B	13-10-2021	ADDITIONAL DETAIL AND LEVELS	
A	23-06-2021	SLIPWAY RAILS UPDATED	
REV.	DATE	AMENDMENTS	
 <p><b>Rygate &amp; Company Pty Limited</b> P.W. Rygate &amp; West ABN: 61 001 204 897</p>		<p>a Suite 904 Level 9, 89 Wyke St Sydney NSW 2000</p> <p>p +61 2 9262 6800</p> <p>f +61 2 9262 6943</p> <p>e <a href="mailto:surveyors@rygate.com.au">surveyors@rygate.com.au</a></p> <p>w <a href="http://rygate.com.au">rygate.com.au</a></p>	
SURVEYING SINCE 1893			
SUBDIVISION   STRATA PLANS   STRATUM SUBDIVISION   LEASE PLANS   TOPOGRAPHIC MAPS   GPS SURVEYS   3D MODELLING   RACECOURSE PROJECT   PROJECT MANAGEMENT   SUN SHADOW DIAGRAMS			
SURVEYOR	DRAWN	CHECKED	APPROVED
A.C.	S.K.	A.C.	G.J.F.
			
DATUM : AUSTRALIAN HEIGHT DATUM			
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SHOWING DETAIL & LEVELS LOT 102 D.P.803977 No.167 RIVERVIEW ROAD			
CAD REFERENCE		79619 Rev B.DGN	
REFERENCE No.	PLAN No.	DATE	SHEET No.   GPS
79619		14/06/2021	OF 2 SHEETS



LEGEND

TPZ

Tree Protection Zone

SRZ

Structural Root Zone

Tree to be Removed

T1

Tree identification number

The plan shows a property with a site area of 1659m² (D.P. 803977) and a foreshore building line. Key features include:

- Buildings:** No. 167 2 STOREY BRICK & TIMBER RESIDENCE, No. 165 3 STOREY METAL RESIDENCE, and a TIMBER BOATSHED.
- Landscaping:** Various trees are marked with identification numbers (T1, T2, T3, T4, T5, T6, T7, T8, T9) and their respective Tree Protection Zones (TPZ) and Structural Root Zones (SRZ).
- Infrastructure:** A new concrete extension to the existing driveway slab, a steel balustrade with timber handrail, and an inclinator rail path from the existing house to the bottom of the property.
- Other Features:** A paved area, a stone path, a stone wall, a concrete wall, a brick wall, a timber deck, a timber boatshed, a metal carport, a garage metal roof, a right of way, and a concrete vehicle crossing.

REVISION NOTES  
rev 1 - 12.10.2021 - inclinator rail added  
rev 2 - 19.11.2021 - new scheme on south boundary  
rev 3 - 28.11.2021 - inclinator path amended  
rev 4 - 29.11.2021 - top inclinator amended

Yoram Shabat Architect  
SACAP registration no. 5960  
4 Pines Road, Newlands, Cape Town 7700  
t. 021783 310 0017 e. yoram.shabat@gmail.com  
project details:  
ALTERATIONS & ADDITIONS  
167 RIVERVIEW RD.  
CLAREVILLE, NSW - DP 803977  
drawing information:  
SITE/ROOF PLAN

drawing no: EHRL\_100 rev 4  
scale 1:100 @A1  
date: 29th November 2021