

arboricultural impact assessment report

AIA-01

Revision B, Issued for LEC Determination
12 April, 2019

DOCUMENT INCLUDES

- T-01& T-02 Tree Retention Value Plans
- T-03 Tree Protection Specification & Tree Schedule
- T-04 & T-05 Tree Protection & Removal Plans

PROJECT

Laitoki Road Aged Care Development

58 Laitoki Road
Terrey Hills, NSW 2084

CLIENT / PRINCIPAL

Tolucy Pty Limited

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i EXECUTIVE SUMMARY

On the 22 June 2018, Arterra was engaged by Calder Flower on behalf of Tolucy Pty Ltd to undertake an arboricultural assessment of the trees located at 58 Laitoki Road and prepare the relevant arboricultural reports and plans to help guide the proposed re-development. A tree assessment and impact schedule was completed for all the trees. (Refer to Appendix 4.1 – Tree Impact Assessment Schedule). The trees were photographed and given a unique identification number and plotted onto a scaled survey base plan for referencing and identification throughout the report and for future discussions and co-ordination with contractors and stakeholders.

In summary **220** trees were assessed for this report and their origin and whether they are removed or retained is shown below:

Tree Origin	Retained	Removed	Total Trees
Endemic	96	111	207
Native	5	1	6
Exotic	-	2	2
Invasive	-	5	5
Total	101	119	220

Table 1 – Tree population by origin

The broad species breakdown is as follows:

- **68** (31%) are *Ceratopetalum gummiferum* (New South Wales Christmas Bush).
- **45** (21%) are *Allocasuarina littoralis* (Black She-oak)
- **34** (16%) are *Pittosporum undulatum* (Sweet Pittosporum)
- **28** (13%) are *Eucalyptus sieberi* (Black Ash)
- the remaining **45** (19%) are a mix of primarily endemic species (**32**), together with a few Australian natives (**6**), exotic and invasive (**7**) species.

A total of **119** trees are proposed for removal, **56** of which are exempt species, or have been rated with Low or Very Low/Remove retention values. The remaining **63** trees to be removed are either within the footprint of the proposed works or are so close to the works as to require removal to facilitate the works.

101 Trees are proposed to be retained and protected, all of which are situated around the perimeter of the site with the majority situated along the Cooyong Road frontage. Coordination with the project engineers in regard to the proposed road widening and kerb installation along this frontage indicates that the proposed verge area re-grading can be minimised to enable retention of most of the trees along the frontage, albeit with some experiencing major TPZ incursions. However, given the pre-existing road and table drain configuration and compacted road base conditions to the south, root development under the existing road is expected to be minimal and therefore the nominal incursions are considered acceptable. Trees that are in obvious and direct conflict with the proposed kerb installation have been shown removed. **One (1)** tree along this frontage is currently noted as 'Conditionally Retained'. It is the author's opinion that this tree may also be able to be retained, subject to inspection of the level of root disturbance sustained during kerb installation.

It should be noted that although a significant number of trees are currently proposed for removal, **40** (33%) are exempt species under the Northern Beaches (Warringah) Council LEP. Importantly, the proposed landscape treatments also incorporate extensive replanting of locally endemic species to offset the tree removals and assist in restoring the endangered Duffys Forest Ecological Community. A total of 30% of the site area (5872m²) is proposed to be revegetated in this way.

As with all aspects in the development and construction process, the tree related constraints have to be weighed up against many other relevant development opportunities and constraints. The retention of the trees on the site must also consider economic, social, environmental, construction and practical realities.

This document has been prepared by Arterra Design Pty Ltd, using the expertise of our in-house consulting arborist (AQF Level 5), Robert Smart. Robert is a member of the International Society of Arboriculture - Australian Chapter and is also a Registered Consulting Arborist with Arboriculture Australia.



Robert Smart AAILA, ISA, AA

Director, Registered Landscape Architect (054), Registered Consulting Arborist (1804).

1.0 INTRODUCTION

1.1 Background

On the 22 June 2018, Arterra Design was engaged by Calder Flower on behalf of Tolucy Pty Ltd (the client) to undertake an arboricultural assessment of the site and prepare the relevant reports and plans to help guide the re-development. This assessment was restricted to the trees within or immediately adjacent to the site that were likely to be impacted by the proposed works. The other trees within the broader site and unlikely to be impacted are not specifically addressed as part of this report.

The client proposes to redevelop 58 Laitoki Road, Terrey Hills (the site) to accommodate a new seniors living facility including approximately 90 bed RACF and 48 ILUs. The site is currently a small rural lot of approximately 2.0 hectares with a residence, equestrian arena and a number of sheds, pathways, stables and other outbuildings. The site currently has trees and other vegetation around the perimeter, through the centre of the site surrounding the residence and in the portion east of the main driveway between the house and adjacent to Laitoki Road. It is likely that any proposed construction work on the site will have a variety of impacts on the surrounding mature trees.

Arterra completed a "Pre-development Assessment" of the existing trees that identified the trees and ranked their relative significance, health and retention values. This work was distributed to the client and also to the design team to help guide the development proposals.

This impact assessment has been prepared to identify the trees to be retained and removed as part of the development and so that the client can take a proactive approach to the management of the trees to be retained and put in place appropriate measures to protect them during the construction.

1.2 Aims of This Report

The aim of this report is to assess the impact of the proposed development on the existing trees within the site. Specifically, the report aims to:

- Assess the health and condition of the trees;
- Accurately record information relevant to the existing trees;
- Assess the significance, Safe Useful Life Expectancy (SULE) and retention values of the existing trees;
- Provide clear recommendations as to which trees should ideally be retained and protected;
- Identify the proposed Tree Protection Zones (TPZ) of the tree being retained and identify and assess the likely arboricultural impacts of the development on the trees and
- Provide preliminary advice on the tree protection measures that will be required during construction to ensure the trees are successfully retained.

The following limitations apply to this reports use:

1. Plans: All plans are based on information provided to Arterra. They should only be used relating to tree issues and are not suitable for any other purpose.
2. Notification of proposed alterations to disturbance within TPZs: Arterra must be clearly notified of any proposed alterations to the plans or additional disturbance in TPZs, so that we can advise on the implications before any work is undertaken.

1.3 Relevant Controls or Legislation

Northern Beaches (formerly Warringah) Council DCP 2011 defines a 'Tree' as "a palm or woody perennial plant with a single or multi stem greater than five (5) metres in height.

Section E1, Preservation of Trees or Bushland Vegetation, Item 2 states:

"A person must not ringbark, cut down, top, lop, remove, injure or wilfully destroy any prescribed tree or bushland vegetation unless authorised by a current Development Consent. This includes damage to a tree or bushland vegetation by:

- Damaging or tearing live branches and roots;
- Damaging the bark, including attachment of objects using invasive fastenings, the fastening of materials around the trunk of trees which may result in a detrimental impact on tree health;
- Tree topping, where large branches and/or the trunk of the tree is removed from the top of the trees canopy;
- Tree lopping, where branches are removed to reduce the height and spread of the tree.
- Damaging the root zone of a tree by way of compaction, including storage and stockpiling materials;
- Changing of ground levels within the root zone of a tree by way of excavation, trenching, filling or stockpiling;
- Underscrubbing of bushland vegetation;
- Burning of vegetation (not part of a Hazard Reduction Certificate); or

- Any other act or activity that causes the destruction of, the severing of trunks or stems of, or any other substantial damage to, some or all of the native vegetation in an area.

Exceptions to the above apply to for a variety of circumstances listed in the DCP, the most pertinent to this site being the exemption for dead or dying trees, not required for habitat for fauna.

A list of Exempt Species, those species specifically not protected under the DCP, is also provided at Part E, Table 1 in the DCP. The exemptions relevant to this site include:

- *Cinnamomum camphora* (Camphor Laurel)
- *Cotoneaster glaucophyllus* (Cotoneaster)
- *Ficus benjamina* (Weeping Fig)
- *Ligustrum* spp. (Large & Small Leaf Privet)
- *Pittosporum undulatum* (Sweet Pittosporum)
- Palms (other than *Livistona australis* (Cabbage Palm))
- Weeds listed as Priority Weed Species within the Greater Sydney Regional Strategic Weed Management Plan

1.4 Conduct and Author Qualifications

Given the above stated aims of this report, as author of this report, Arterra Design confirms that Robert Smart is suitably qualified (AQF 5 Consulting Arborist) to provide comment and the required arboricultural advice pertaining to these matters.

Furthermore, Mr Smart confirms that he has read and agrees to be bound by the NSW Uniform Civil Procedure Rules 2005, Part 31 Division 2 Provisions, Schedule 7 - Expert witness code of conduct.

Arterra provides specialist consulting arborist services only and does not provide any physical tree work services such as climbing, pruning, removal, root investigations or root pruning. Our advice is based on impartial professional assessment only, as we do not derive any financial benefit from specifying pruning or other physical services. We will not specify any such activities unless we determine them to be essential to ongoing tree health or stability.

1.5 Key Definitions and Abbreviations

The following abbreviations are used throughout this report.

“TPZ” = Tree Protect Zone

This is the area as defined by AS 4970 – “Protection of Trees on Development Sites” and means the typical minimum area above and below ground at a given distance from the trunk to provide for protection of the tree. Most importantly it represents the root zone required to be left undisturbed to maintain a healthy and viable tree. It should be noted, that roots will usually extend well beyond this zone, so this represents the minimum remaining root zone required, assuming all others are lost or damaged due to construction. It is typically calculated as a circle centred on the trunk unless existing site conditions can be assessed and indicate otherwise.

SRZ = Structural Root Zone

This is the area as defined by AS 4970 – “Protection of Trees on Development Sites” and means the area immediately around the base of the tree at a given distance from the trunk within which the woody roots and soil cohesion are considered vital to the structural stability of the tree. Disturbance, damage or removal of soil and roots within this area will typically render the tree unstable and require its removal. It is typically calculated as a circle, centred on the trunk, unless existing site conditions can be assessed and indicate otherwise.

DBH = Diameter at Breast Height

This is the diameter of the trunk measured at 1.4m above ground level.

DGL = Diameter at Ground Level

This is the diameter of the trunk measured at ground level, but just above any root flare.

Inclusion or Included Bark Branch Union

Growth of bark at the interface of two or more branches on the inner side of the branch union which is unable to be lost from the tree and accumulates, or is trapped, between the acutely divergent branches. This can form a weakened branch union in some species.

1.6 Documents Reviewed

Plans and documents referenced and reviewed as part of this tree impact assessment were:-
Calder Flower:-

- LEC Determination Issue
 - Floor Plan Level 2, A102, rev B
 - Floor Plan Level 3, A103, rev B
 - Floor Plan Level 4, A104, rev B
 - Floor Plan Level 5, A105, rev B
 - Floor Plan Level 6, A106, rev B
 - Floor Plan Level 7, A107, rev B
 - Floor Plan Level 8, A108, rev B
 - Floor Plan Level 9, A109, rev B
 - Floor Plan RAC Roof, A110, rev B
 - Floor Plan ILU Roof, A111, rev B
 - Elevations RAC, A221, rev B
 - Elevations ILUs, A222, rev B
 - Section Sheet 01, A210, rev B

We have reviewed conceptual servicing plans for the development and we believe that no new services are proposed to be extended into the proposed TPZs and any existing services that are no longer required will be capped off and left in situ to minimise the likelihood of tree disturbance.

1.7 Site Location, History and Context

The site is located in Terrey Hills on the corner of Laitoki Road and Cooyong Road, approximately 20km north from the Sydney CBD and 8.4km from the coast at Narrabeen.

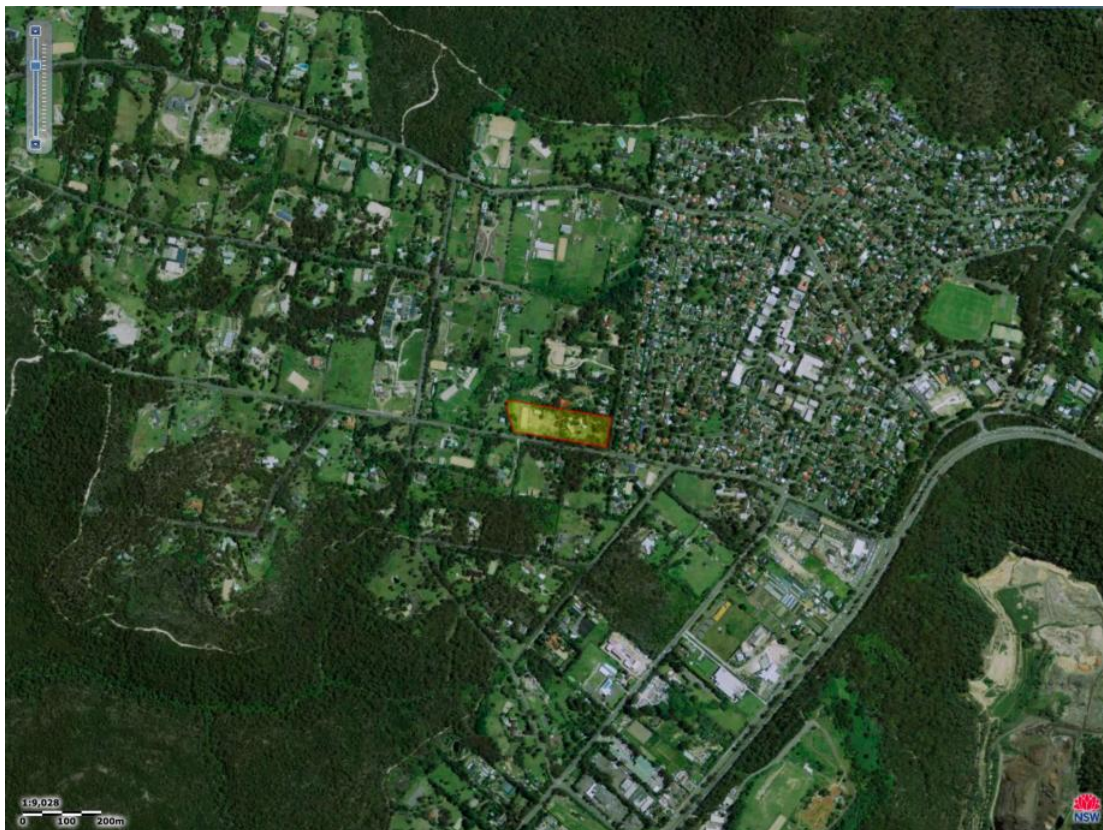


Figure 1 – The site highlighted and outlined red, showing relationship to surrounding National Parks. Ku ring gai Chase to the north and south and Garigal to the east.

1.8 Site Ownership and Zoning

The site is owned by Corner Of The Road Developments Pty Ltd. It is identified as Lot 368 of DP 752017 with a land area 1.95Ha and currently zoned RU4 – Primary Production Small Lots. The surrounding area to the north, west and south is also zoned RU4 while the development to the east of Laitoki Road is zoned R2, Low Density Residential. (Northern Beaches Council (former Warringah) LEP2011) Land Zoning Map (<https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/Public/XC.Track/SearchProperty.aspx?id=120176> accessed 25/06/2018)).

1.9 Assessment Methodology

On 5 July 2018, Robert Smart of Arterra completed a detailed assessment of existing trees located within the site and those immediately adjacent and likely to be impacted by the proposed development. The trees' health and condition were assessed via a visual inspection of the trees from the ground only. Requisite tree data (including DBH, DGL, height & canopy spread, condition & proximity to existing services) were recorded using an Apple iPad and Filemaker Pro database.

The basic health and condition criteria that were inspected for each tree can be summarised as follows: -

- Tree size, broad age-class and general balance of the tree;
- Above ground obstructions;
- Evidence of recent site disturbance;
- Canopy foliage size, colour and density;
- Dieback and epicormic growth;
- Trunk or branch wounding, branch tear outs and pruning history;
- Structural defects such as any co-dominant stems, cracks, splits, included bark, decay and
- Pests and disease evidence or occurrence.

All of the trees were photographed and given a unique identification number and plotted onto a scaled base plan for referencing and identification throughout the report and for future discussions and co-ordination. (Refer Appendix 4.2 T-01-T02 'Tree Retention Value Plans' and Appendix 4.3 T03-T05 'Tree Protection & Removal Plans & Specification'). The photographic record of trees and general site context was taken using the inbuilt Apple iPad camera and a Nikon Coolpix AW120 digital camera with GPS recording. Files have been resized, dated, named and filed in accordance with normal office procedures and protocols. No other image manipulation has been undertaken.

Tree trunk diameters were measured using a metric diameter tape measure. Tree heights were measured using the two point clinometer function of a Nikon Forestry Pro laser range finder. Canopy spreads were estimated by pacing out distances along the cardinal axis of the canopy and cross-referencing to survey information and aerial photos. Canopy position and extents were then altered on the plans to more accurately portray the canopy extent and position.

A representative soil sample was taken in the immediate vicinity of the trees and tested for pH, structure, colour and soil texture class to get a basic understanding of likely soil conditions and topsoil depths surrounding the trees. The testing was done using a Dormer 50mmØ hand soil auger.

Tests for pH were done using a Manutec field pH test kit. Soil structure was assessed by observation of soil pedality and soil texture assessment was done using procedures outlined for the field-testing of a moist bolus by McDonald et al, 1998 and Roberts, et al, 2006.

No exploratory excavations were done to determine location and condition of roots and no detailed soil laboratory testing was undertaken. No specialised equipment or methods were employed to test for the extent of decay in any of the trees, apart from a nylon 'sounding' mallet. No plant samples were analysed or independently tested to verify or formally identify any pests or diseases.

Desktop Review and Research

Digital AutoCAD files of the proposed works were imported into Arterra's standard CAD software (ArchiCAD v21) and superimposed over the tree and site survey information. The extent of site disturbance was analysed for the proposed building works, landscaping, services and other site grading. An assessment was made of the likely extent of impacts on the TPZs, taking into account the likely construction impacts depending on the type of work being undertaken (ie: cut or fill, suspended slabs, decks, service trenches). Various area calculations and measurements were made in the CAD software of the likely incursions into the TPZs or SRZs.

Recent aerial photography data was obtained from the Nearmap website with aerial photos of the site dating from January 2018 imported into the above software for cross checking and assessment. (<http://www.nearmap.com/> accessed 27.06.2018)

Climatic data was obtained from the Bureau of Meteorology using statistics from the Terrey Hills automated weather station. (<http://www.bom.gov.au/climate/data/> accessed 4 July 2018)

1.10 Pre-Development Tree Assessment – Tree Retention Values

The information gathered in the field was tabulated and the tree retention value assessed using a combination of techniques commonly used and recognised in the arboricultural industry. The tree life expectancy was established using the Safe Useful Life Expectance (SULE) system. A brief summary of these systems is provided below.

SULE

This is a system developed by Jeremy Barrell in 1993 that determines the time a tree may be expected to be retained based on its age, health, condition, safety and location. This is then moderated by the economics of maintenance or other costs of retaining the tree. A long SULE means the tree is presently expected to live longer than 40 years with minimal intervention and cost. A short SULE indicates a tree that is not expected to live longer than 5 years or may require substantial intervention or costs to retain it.

RETENTION VALUE

The proposed retention value of the trees was determined based on a considered combination of the size, age, condition and suitability of the tree.

Each tree was then ranked according to one of 4 retention categories.

1. **"High" Retention Value** – these are trees that are typically in good or very good condition, large and visually prominent, historically or environmentally important. They may also be lesser quality trees, but part of an important grouping of trees. They should represent a serious physical constraint to the development and their removal avoided where possible and feasible.
2. **"Moderate" Retention Value** – these are trees that are in good to reasonable condition and should be retained where possible and feasible to do so. They may also be lesser trees, but part of an important grouping of trees and therefore warrant retention based on the group's value.
3. **"Low" Retention Value** – these are trees that are in poor condition or have structural defects, are particularly small or commonplace, are not historically, environmentally or socially significant and should not be considered as a constraint to the development. They could be retained only if they are not likely to be impacted by, or constrain potential desirable, development outcomes.
4. **"Should Remove" / No Retention Value** – these are trees that are in very poor health, exhibit poor form, or have serious structural defects, are considered weeds or combination of all these, and therefore should be considered for removal regardless of any development.

Consideration has also been given to the relationship of the trees to one another and their proximity to the likely development areas on the site. For example, trees that are part of a closely spaced group, or are likely to be significantly misshapen or unstable with the removal of surrounding trees and structures are considered with these factors in mind.

1.11 Tree Assessment – Tree Protection Zones

In order to ensure the long-term survival and growth of any tree to be retained on the development site, a suitable area is required to be protected around the tree. This area should typically be as large as possible. It should also take into consideration:

- The size and age of the tree;
- Above and below ground properties;
- The health and condition of the tree;
- The species of tree and its tolerance to disturbance;
- Soil conditions, type, depth and site hydrology and
- Site specific conditions and any existing obstructions to root development

The Tree Protection Zones (TPZs) have been calculated using the formula and criteria outlined in AS 4970-2009 Protection of Trees on Development Sites. In summary the standard applies the calculation for the radius of the TPZ as $12 \times$ (the tree trunk diameter (in metres) calculated at breast height (DBH)). DBH is taken at 1.4m above ground level. A maximum TPZ radius will be 15m (unless crown protection is required) while the minimum TPZ radius shall be 2m.

The TPZ is typically assumed to be radial and centred on the centre of the tree's trunk unless other site factors or tree canopy size and location dictate an adjustment. Encroachments of up to 10% of the area may be accepted within the TPZ as long as it is outside of the Structural Root Zone (SRZ). This is known as a "minor encroachment". Encroachments greater than this, known as "major encroachments" will only be accepted with additional specific evidence that the tree will not be unduly impacted.

Whenever an encroachment is made into a TPZ, a suitable compensation should be made elsewhere and physically contiguous to the remaining TPZ. The Structural Root Zone (SRZ) is the area defined as the minimum area required to retain the structural stability of the tree. The formula for calculating the SRZ is outlined in AS 4970 Section 3.3.5. No encroachment into the SRZ shall typically be allowed.

2.0 KEY FINDINGS & OBSERVATIONS

2.1 The Proposed Development

The proposed building and development will result in a major site disturbance. This will potentially have a significant impact on the trees within and adjacent to the site.

Specifically, the proposed development will involve:

- Major demolition works;
- Use of large scale civil and earthmoving equipment;
- Access to and from the site with large trucks and construction plant;
- Major excavations;
- Large stockpiles of excavated material and demolition waste;
- Stockpiles/ storage of building materials;
- Regrading and filling of the surface levels;
- Trenching for services;
- Major building works involving concreting, painting and general construction;
- Use of large cranes;
- Parking for site personnel and deliveries;
- Paving and retaining walls and
- Landscaping.

Key Assumptions:

- All excavations near trees are to be undertaken and retained using sheet, soldier or contiguous piling techniques. Even relatively small excavations, when done near trees are to be retained using soldier piling or similar.
- Despite the above, the line of disturbance outside of the building line has been typically estimated at 1.5m from the face of the building to allow for provision of water proofing, services, access and scaffolding around the building during construction.
- All services for the building will enter and exit from the Cooyong Road frontage and will be clear of any retained trees TPZs
- All construction access and deliveries are to be made from Cooyong Road. Concrete will typically be pumped and will not require any truck movements through TPZs.
- Where no spot levels are indicated it is assumed that the existing surface levels are retained.
- It is assumed that any new landscape grading within the TPZs will be minimal.
- Excavations will be carried out from within the proposed building footprint to minimise likely construction impacts to trees retained on the site perimeter.
- That traditional cantilevered retaining wall footings will be used (ie: footings extending to the rear of the face of the wall, typically equalling the height of the wall).

2.2 Climate and Microclimate

The site is located in Sydney's Northern Beaches LGA, and therefore shares the general climate of this region with moderate temperatures, good rainfall and minimal climatic and weather extremes. It is typically described as a temperate climate with hot to warm summers and cool winters, with relatively uniform rainfalls greater than 800mm / year. There is no distinct dry season.

Terrey Hills is located approximately 8.4km from the ocean and the coastal beaches of Narrabeen and Long Reef. It has an average annual rainfall of 1089mm, fairly evenly spread across the year but with a slightly drier period during the late winter and early spring months. The highest rainfall period is usually June with an average of 148mm and the driest month being May with an average of 51mm.

Maximum average daily temperatures range from 26.8°C in January and to 16.1°C in August. The minimum average daily temperatures range from a high of 18.4°C in January down to lows of 7.6°C in July.

The site has a south westerly aspect. It may typically be defined as a relatively open, unprotected location with defined coastal influences.

The primary wind direction is from the south-east to the north-east in the afternoons while it is predominantly from the west and south-west in the mornings. This is common of coastal areas dominated by "sea breeze" affects. Sea breezes are caused by unequal heating and cooling of adjacent land and sea surfaces. A sea breeze is one that blows from the sea to the land in consequence of this differential heating. With a weak general wind circulation, a sea breeze will commence over the coastline soon after the land temperature begins to exceed the

sea temperature (late morning to early afternoon). As the difference increases, so the sea breeze will become stronger and will extend farther inland. (Source: Australian Bureau of Meteorology)

The strongest winds (>40km/h) are normally experienced from the south or westerly directions and later in the day. (Based on wind roses obtained from the Bureau of Meteorology weather station at Observatory Hill, Sydney)

There are no prominent microclimatic influences apparent on the site.

2.3 Soils and Landform

The site has a moderately sloping landform, which has been disturbed over the years to create levelled areas for horse paddocks in the centre of the site and horse training facilities in the west of the site including a sand arena, stables and holding yards. Currently the main residence is situated centrally on the site but to the east of the individual horse paddocks. The site slopes down to the south and the west from the high point in the north-eastern corner to the low point in the south western corner. Elevation ranges from an RL of approximately 194m in the northeast down to 172m in the southwest (an elevation change of approximately 22m). On the proposed development site, the slopes are typically moderate with grades around 1 in 12 (approximately 8% slopes).

To the west of the existing sand arena, the western most portion of the site is defined by a riparian zone with a mapped waterway, 'Neverfail Gully' running north south through the site. Neverfail Gully extends south from the site, under Cooyong Road and through the adjacent lots to join with Kieran's Creek in Ku-ring-gai Chase National Park. Kieran's Creek continues west through Ku-ring-gai Chase National Park and discharges into the headwaters of Cowan Creek.

Soil landscape mapping of the area describes the site soils as being part of the Somersby Soil Landscape association. This is typical of sandstone plateau surfaces of the Hornsby Plateau in the Ku-ring-gai Chase National Park and Terrey Hills. Characterised by gently undulating hills on deeply weathered Hawkesbury Sandstone plateaus. Rock outcrops are generally absent and vegetation characterised by low, open woodland and scrubland.

Moderately deep red to yellow earths with lateritic gravels and clays on crests. Very low natural fertility and highly permeable. They typically have low water holding capacity low cation exchange capacity. Colour is bright yellowish-brown to reddish brown as depth increases (Chapman 1989).

The results from soil sample field tests are summarised below:

Topsoil (sample taken at 250mm)

pH = 6.0 slightly acidic

Structure

Very weakly pedal with some fine to medium subangular blocky peds

Texture

Sandy Clay Loam

Subsoil (sample taken at 600mm)

pH = 5.5 strongly acid

Structure

Weakly pedal with a few fine subangular blocky peds

Texture

Clay Loam

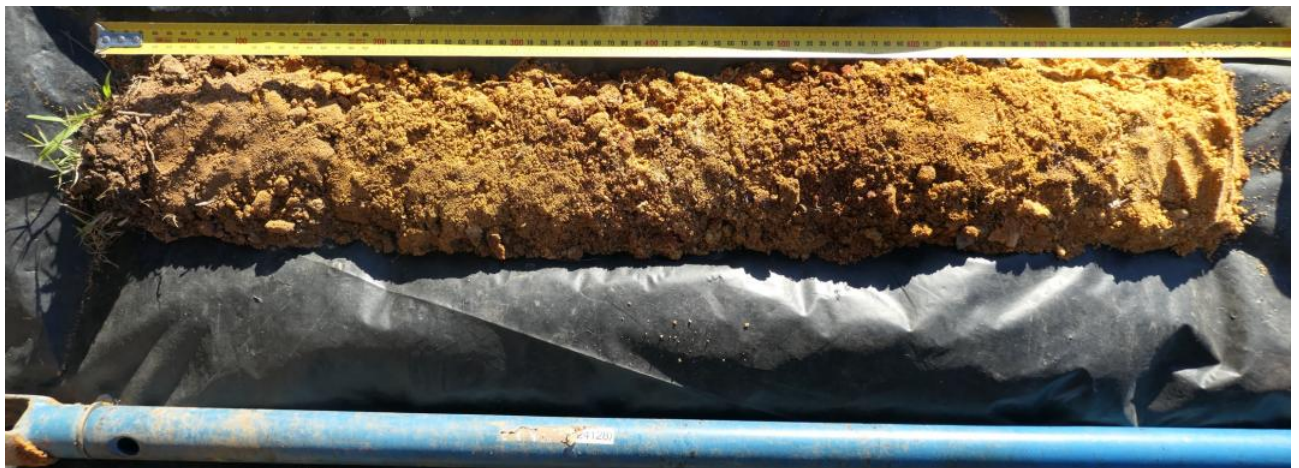


Figure 2 – Typical Soil Profile to a depth of approximately 800mm. (Source: RWS 05/07/18)

2.4 Tree Assessment - General

A total of 220 trees were assessed for this report. They are mostly located around the perimeter of the site with a few scattered throughout the horse paddocks and around buildings. The majority of the assessed trees (207) are locally endemic species with a further 6 trees being Australian natives. Of the 207 trees considered endemic to the site, 34 are *Pittosporum undulatum* (Sweet Pittosporum), an exempt species under the Northern Beaches (Warringah) Council DCP.

The site is mapped by NSW Office of Environment & Heritage to contain the *Duffys Forest Ecological Community in the Sydney Basin Bioregion* which is listed as an *Endangered Environmental Community (EEC)*. The tree population of the site is generally reflective of the species expected within the *Duffys Forest Ecological Community*, with the exception of weeds and amenity planting.

The Duffys Forest Environmental Community is described as:

Open-forest or woodland community dominated by *Corymbia gummifera* (Red Bloodwood), *Eucalyptus sieberi* (Black Ash), *Angophora costata* (Smooth-barked Apple), and frequently *Eucalyptus capitellata* or *Eucalyptus oblonga* (Stringybark). Other understorey species include *Acacia myrtifolia* (Myrtle Wattle), *Banksia spinulosa* (Hairpin Banksia), *Lasiopetalum ferrugineum* (Rusty Velvet-bush), *Lomatia silaifolia* (Crinkle Bush), *Persoonia levis* (Broad-leaf Geebung), *Billardiera scandens* (Apple-berry), *Entolasia stricta* (Wiry Panic), *Lomandra obliqua* (Twisted Mat-rush), *Micrantheum ericoides* and *Xanthorrhoea media* (Grass Tree).

(NSW Office of Environment & Heritage: www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10254 accessed 19/09/2018)



Figure 3 – The site, outlined in red, and the trees subject of this assessment. (Source Nearmap)

The following tables provide a breakdown of the tree population by species origin and by species as a proportion of the total population. Only 2 exotic and 5 invasive trees were also assessed due to their size and location. The majority of the vegetation on the perimeter of the site, along both the Laitoki Road and Cooyong Road frontages, is a thicket of trees and saplings, the majority being Pittosporum, Privet, Cotoneaster and Casuarina, all of which were either exempt or considered too small and too dense for individual survey, assessment and mapping. These thickets have been shown 'clouded' on the accompanying drawings in the Appendices while the larger trees have been assessed and mapped individually.

Table 2 – Tree population by origin

Tree Origin	Number of Trees
Endemic	207
Native	6
Exotic	2
Invasive	5
Total	220

Table 3 – Tree population by species

Tree Species	Number of Trees	% of Population
<i>Acacia parramattensis</i>	8	3.6%
<i>Allocasurina littoralis</i>	45	20.5%
<i>Angophora costata</i>	1	0.5%
<i>Araucaria columnaris</i>	1	0.5%
<i>Banksia serrata</i>	7	3.2%
<i>Ceratopetalum gummiiferum</i>	68	30.9%
<i>Cinnamomum camphora</i>	4	1.8%
<i>Corymbia citriodora</i>	3	1.4%
<i>Corymbia gummifera</i>	9	4.1%
<i>Cotoneaster glaucophyllus</i>	1	0.5%
<i>Eucalyptus camaldulensis?</i>	2	0.9%
<i>Eucalyptus haemastoma</i>	2	0.9%
<i>Eucalyptus oblonga</i>	2	0.9%
<i>Eucalyptus sieberi</i>	28	12.8%
<i>Ficus benamina</i>	1	0.5%
<i>Hakea salicifolia</i>	1	0.5%
<i>Pittosporum undulatum</i>	34	15.5%
<i>Xylomelum pyriforme</i>	1	0.5%
<i>Eucalyptus capitellata</i>	2	0.9%
Total	220	100%

Detailed information on each tree assessed including; heights, trunk diameters, canopy spreads, age classes and condition are all provided in Appendix 4.1 - 'Tree Impact and Assessment Schedule'.

2.5 Tree Biology and Tree Care Basics

Trees are dynamic living organisms. Trees can be very susceptible to damage, stress and declining rapidly if overly impacted by construction. Trees take decades to grow but can be injured and killed in a very short time frame. This is particularly due to the irreparable damage to the often shallow, extensive and unseen root systems. It is rarely possible to repair a stressed or damaged tree, after the damage has occurred. Proper protection is the key to minimising construction related impacts. Severing of roots within the Structural Root Zone (SRZ) can also lead to potentially unsafe instability of the tree as a structure.

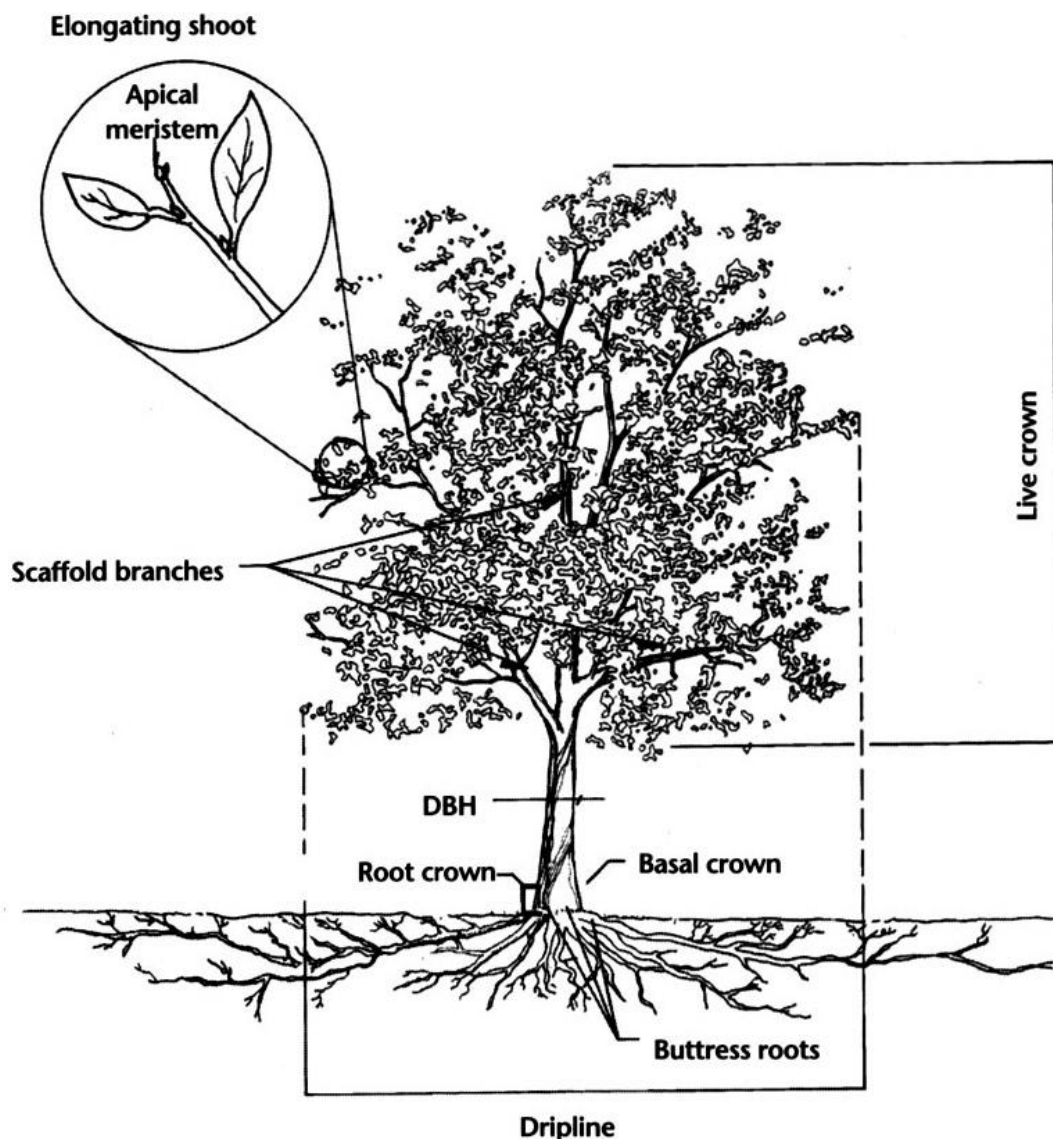


Figure 4 – Typical form and structure of a tree illustrating the typical form, location and extent of root growth (Source: Matheny and Clark, 1998)

Basic Tree Needs

As a living organism a tree remains alive by completing the following chemical reaction - Carbon Dioxide and water in combination with chlorophyll and light is converted to Glucose and Oxygen $CO_2 + H_2O + \text{light} = \text{sugar (CH}_2\text{O [Glucose])} + O_2$

The process ultimately leads to the plant cells 'respiring' and producing energy for survival, a natural requirement for all living cells. Anything that affects a plant's photosynthesis and then cellular respiration will affect the overall plant health. The limiting factors of photosynthesis and respiration will typically be the availability of oxygen, water and nutrients that make up the important chemical molecules and reactions.

Trees therefore have five basic requirements to survive and successfully grow:

1. Oxygen (and particularly oxygen within the soil);
2. Water (a cellular necessity and primarily taken up by the tree roots);
3. Light & Sufficient Foliage (in order to photosynthesise and create the resources needed for cellular survival);

4. Soil (for physical anchorage and critical chemical nutrients) and
5. Physical Space (both above and below ground to grow).

Importantly, a minimum of 15% soil oxygen is required for active root growth and nutrient uptake. Less than 10% available soil oxygen starts to restrict root extension and growth and a minimum of 3% soil oxygen is required to just maintain root existence. Less than this will result in root death (Harris 1999).

One of the most insidious effects of construction on trees is often that of soil compaction or covering of root zones with impervious surfaces, as it:

- Reduces infiltration rates of surface water;
- Reduces the availability of water to the roots as they can't naturally extract remaining moisture when soil becomes too dry;
- Reduces air to roots (roots cease to function properly and die without oxygen);
- Increased soil strength caused by compaction mean that roots need more energy to growth through it or can't even physically penetrate the soil;
- Roots are physically broken or crushed and there is increased potential for fungal and pathogen attack. (Harris 1999).

Tree Tolerance

Typically, older and larger trees are less tolerant of construction impacts. Different species also have different tolerance of injury and disturbance. Importantly it needs to be stressed, that a tree does not "heal" from injury as animals do. Typically, any injury made to a tree results in the tree expending considerable energy reserves to create new growth that "seals" and surrounds a wound and then attempting to compensate structurally and physically for any losses. Impacts to trees are therefore cumulative and a series of otherwise small and unrelated impacts can easily result in the death of a tree.

A tree that is already compromised or showing signs of stress is far less likely to tolerate construction impacts due to its lower levels of energy reserves and already weakened state. Therefore, a tree that is only in a fair condition or poor condition is less likely to tolerate construction impacts than a young tree in good or excellent condition.

Weakened or stressed trees are also far less able to combat the myriad of normal environmental stresses and pathogens that are naturally imposed against them such as drought, decay, fungi, bacteria and insect pests.

2.6 Tree Impact Assessment

The intention of this assessment is to clearly illustrate the trees to be retained and removed as part of the development. It is also to determine any incursions into the retained trees' root zones and canopies by the proposed development and evaluate the likely impact of the proposed works on the trees. A detailed listing of the incursions and likely impacts of the proposed development on each tree is shown in Appendix 4.1 – Tree Impact and Assessment Schedule.

Of the 220 trees assessed:

- 101 are proposed to be retained and protected
- 119 are proposed to be removed

Of the 101 trees proposed to be retained and protected

- All trees to be retained are located on the perimeter of the site
- The majority are located along the Cooyong Road frontage and shown as retained to screen and soften the building from the road. The tree noted as 'conditionally retained' is discussed further under the 'Cooyong Road Frontage' subheading below.
- A number of trees will be subject to encroachments, both minor and major, as defined under AS 4970 and these are discussed further in the following section.

Of the 119 trees proposed for removal

- 40 are proposed for removal as exempt species;
- A further 6 are rated as very low/ no retention value and recommended for removal regardless of the likely development impacts
- The remaining trees proposed for removal are within the footprint of the proposed works or so close as to require removal to facilitate the works.
- The trees proposed for removal are generally not discussed in the following section.

It should be noted that although a significant number of trees are proposed for removal to facilitate the project, as noted above, **40** are exempt species under the Northern Beaches (Warringah) Council LEP and a further **6** are trees in very poor condition that would be recommended for removal regardless of any development impacts. The proposed landscape treatment also incorporates extensive replanting of locally

endemic species to offset the tree removals and assist in restoring the endangered Duffys Forest Ecological Community.

The trees likely to experience more significant construction related impacts are discussed further below. All construction related tree impacts are shown graphically in Appendix 4.2 T-04 & T-05 - Tree Protection & Removal Plans.

Cooyong Road Frontage

It is currently understood that Council will require the portion of Cooyong Road along the frontage of the development to be widened, including the installation of kerb and guttering, to match the road alignment east of Laitoki Road. Updated engineering plans for the road widening show the proposed extent of re-grading of the roadside verge along this frontage is to be minimised and done in a sensitive way to minimise impacts to most of the street trees and a number of site trees worthy of retention. Our arboricultural plans currently show the extent of the proposed road widening and have assumed minimal re-grading at the interface of the road kerb and the existing verge to simply accommodate the installation of the kerb and gutter, thus retaining the majority of the trees. Based on this minimal re-grading we have shown most trees as retained and one tree as 'Conditionally Retained' shaded Pink on T-05 – Tree Protection & Removal Plans. The nominal TPZ incursions as noted in the table below are hatched in dark blue on the above plan.

The ability to retain the trees along the Cooyong Road verge is illustrated and displayed in the following typical verge section. (Excerpt from Arterra Design - Drawing L-SD-07- section 02).

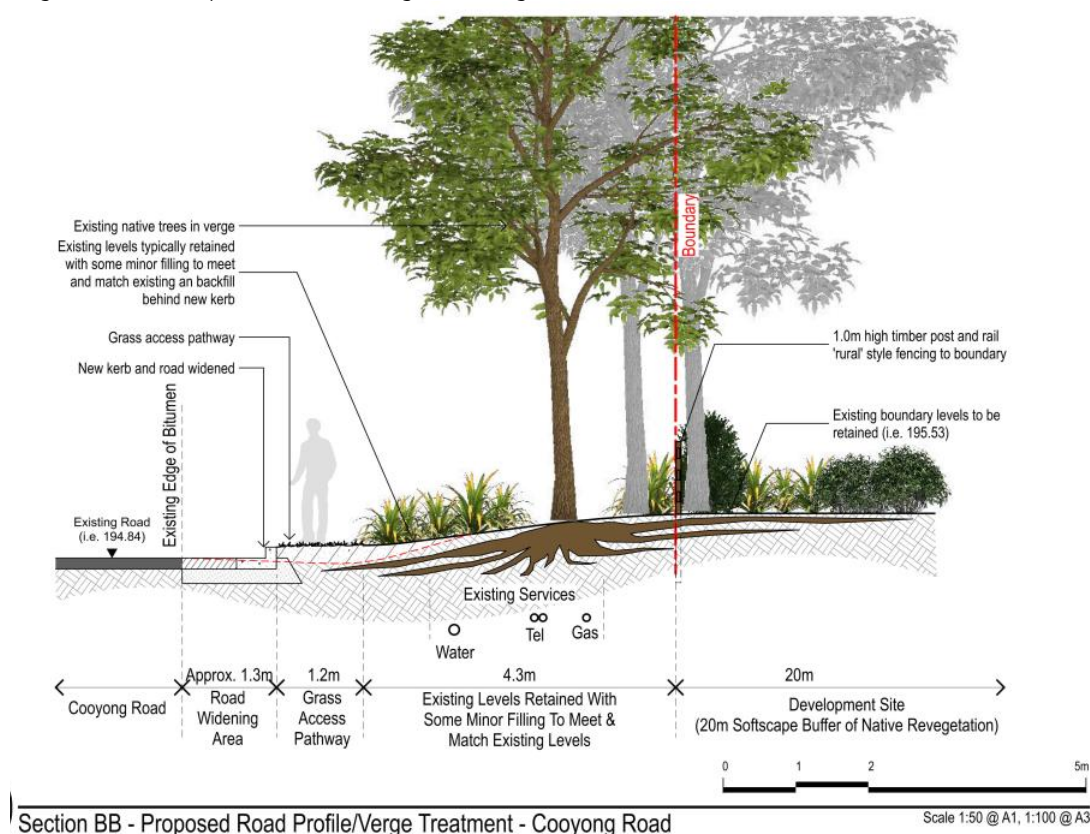


Figure 5 – Typical road verge section proposed along Cooyong road frontage that illustrates that the existing tree roots associated with the verge and nearby trees should sustain minimal impacts from proposed widening and kerb installation. (Source: Excerpt from Arterra Drawing L-SD-07 Section 2, and based on discussions and advice from project engineers- Martens).

Six (6) trees are noted in the table below to be removed to provide for the appropriate safe clearance to the new road and kerb alignment. Should the road widening not proceed these trees could possibly be retained. The other trees in this area that have been nominated and shown for removal based on their poor condition or due to them being unsuitable species (weeds, invasive or exotic) are also shown as removed on T-04 & T-05 – Tree Protection & Removal Plans but not listed in the table below.

The trees proposed to be retained are likely to experience some degree of root impact due to the road widening works. It is also likely the street trees along this frontage have historically suffered some degree of root loss or impaired root development in the southern portion of their nominal TPZs, towards Cooyong Road due to the road itself or maintenance grading of the current table drain. Although a number of trees are shown to experience nominal incursions greater than 10% (one almost 24%) the incursions are all in the southern (road side) portion of the TPZs where limited root development is expected. The remainder of the TPZs remain undisturbed. On this

basis the impacts from the works are likely to be less than would typically be expected in an open field situation and it is currently proposed to retain the trees and maintain the screening to Cooyong Road rather than recommend their removal based on nominal incursions alone.

The following table lists the trees to be either **Removed** to accommodate the road widening and those noted as **Retained** or **Conditionally Retained**. The comments summarise the likely impacts on the trees based on only minimal re-grading taking place to install the kerb and gutter.

Table 4 – Trees impacted by proposed Cooyong Road widening

Tree ID	Tree Species	Retention Value	Retained or Removed	Comments Re: Conditional Retention & Removal based on proposed road widening
108	<i>Eucalyptus sieberi</i>	High	Retained	Street tree likely to experience some root loss due to works. Major incursion of approx. 12% per AS4970.
109	<i>Acacia parramattensis</i>	Moderate	Retained	Street tree likely to experience some root loss due to works. Minor incursion of approx. 5% per AS4970.
110	<i>Allocasuarina littoralis</i>	Low	Retained	Street Tree retained with no impact based on minimal regrading.
111	<i>Allocasuarina littoralis</i>	Low	Retained	Street Tree retained with no impact based on minimal regrading.
112	<i>Allocasuarina littoralis</i>	Moderate	Retained	Street Tree retained with no impact based on minimal regrading.
113	<i>Eucalyptus sieberi</i>	Moderate	Retained	Street tree likely to experience some root loss due to works. Major incursion of approx. 19% per AS4970.
114	<i>Allocasuarina littoralis</i>	Moderate	Retained	Street Tree retained with no impact based on minimal regrading.
115	<i>Allocasuarina littoralis</i>	Moderate	Retained	Street Tree retained with no impact based on minimal regrading.
116	<i>Eucalyptus sieberi</i>	Moderate	Retained	Street Tree retained with little or no impact based on minimal regrading.
122	<i>Eucalyptus sieberi</i>	Low	Retained	Site tree likely to experience some root loss due to works. Minor incursion of approx. 10% per AS4970.
190	<i>Allocasuarina littoralis</i>	Moderate	Retained	Street Trees (copse of 9 saplings) retained with no impact based on minimal regrading.
191	<i>Allocasuarina littoralis</i>	High	Retained	Street Tree retained with no impact based on minimal regrading.
203	<i>Allocasuarina littoralis</i>	Moderate	Retained	Site tree retained with no impact based on minimal regrading.
207	<i>Corymbia gummifera</i>	High	Retained	Site tree retained with no impact based on minimal regrading.
208	<i>Corymbia gummifera</i>	Moderate	Retained	Site tree likely to experience some root loss due to works. Minor incursion of approx. 5% per AS4970.
209	<i>Allocasuarina littoralis</i>	Moderate	Retained	Site tree retained with no impact based on minimal regrading.
212	<i>Corymbia gummifera</i>	Moderate	Retained	Site tree retained with no impact based on minimal regrading.
213	<i>Allocasuarina littoralis</i>	Moderate	Retained	Site tree retained with no impact based on minimal regrading.
214	<i>Eucalyptus sieberi</i>	High	Retained	Site tree likely to experience some root loss due to works. Minor incursion of approx. 5% per AS4970.
245	<i>Allocasuarina littoralis</i>	High	Retained	Street tree (one of two), retained with no impact based on minimal regrading.
245	<i>Allocasuarina littoralis</i>	High	Removed	Street tree (one of group of two), removed to provide adequate safe clearance from new kerb alignment.
246	<i>Allocasuarina littoralis</i>	Moderate	Removed	Street tree, removed to provide adequate safe clearance from new kerb alignment.
247	<i>Eucalyptus sieberi</i>	High	Conditionally Retained	Street tree likely to experience some root loss due to works. Major incursion of approx. 24% per AS4970.

248	<i>Allocasuarina littoralis</i>	Moderate	Retained	Street Tree retained with no impact based on minimal regrading.
249	<i>Allocasuarina littoralis</i>	Moderate	Retained	Street Tree retained with little to no impact based on minimal regrading.
250	<i>Eucalyptus sieberi</i>	High	Removed	Street tree, removed to provide adequate safe clearance from new kerb alignment.
251	<i>Allocasuarina littoralis</i>	Moderate	Removed	Street tree, removed to provide adequate safe clearance from new kerb alignment.
252	<i>Allocasuarina littoralis</i>	Moderate	Removed	Street tree, removed to provide adequate safe clearance from new kerb alignment.
253	<i>Allocasuarina littoralis</i>	Moderate	Removed	Street tree, removed to provide adequate safe clearance from new kerb alignment.
254	<i>Allocasuarina littoralis</i>	Low	Removed	Low value street tree. Recommended to remove.
255	<i>Allocasuarina littoralis</i>	Very Low/ Remove	Removed	Very low value street tree, removed to provide adequate safe clearance from new kerb alignment.
257	<i>Allocasuarina littoralis</i>	Low	Retained	Street tree. Little or no root loss expected.
258	<i>Cinnamomum camphora</i>	Very Low/ Remove	Removed	Street tree, exempt/ invasive species, should be removed.
259	<i>Pittosporum undulatum</i>	Low	Removed	Street tree, exempt species, poor tree, should be removed.



Figure 5 – View east Cooyong Road frontage showing street trees in the road verge, and other saplings. (Source: RWS 05/07/2018)

Laitoki Road Frontage

It is currently understood that Council will require the western side of Laitoki Road along the frontage of the development to also be widened, including the installation of kerb and guttering, to match the eastern side of Laitoki Road.

The following table lists the street trees to be removed to accommodate the road widening and those noted to be retained together with the likely impacts from the proposed roadworks. Trees to be removed based on poor condition or inappropriate species are not listed in the table but are shown graphically on T-05 – Tree Protection & Removal Plans together with the trees to be retained and any likely TPZ incursions.

Table 5 – Trees impacted by proposed Laitoki Road widening.

Tree ID	Tree Species	Retention Value	Retained or Removed	Comments
129	<i>Ceratopetalum gummiferum</i>	Moderate	Retained	Site trees (copse of six saplings) may experience some root loss due to works. Minor incursion of less than 5% per AS4970.
137	<i>Ceratopetalum gummiferum</i>	Moderate	Removed	Street trees (copse of three saplings) to be removed to provide safe clearance to kerb alignment and provision of footpath.
138	<i>Ceratopetalum gummiferum</i>	Moderate	Removed	Street trees (copse of five saplings) to be removed to provide safe clearance to kerb alignment and provision of footpath.
141	<i>Araucaria columnaris</i>	Moderate	Removed	Street tree to be removed due to conflict with proposed kerb alignment.



Figure 6 – Laitoki Road frontage showing thicket of Pittosporum, Lantana and other small saplings. (Source: RWS 05/07/2018)

2.7 Potential Tree Related Impacts to be Managed During Construction

The main potential impacts from the proposed construction activity can be summarised as tree damage and 'reduced life expectancy' caused by:-

- Root loss and disturbance due to excavation for the driveway and other structures;
- Compaction of the root zone from storage and stockpiling of materials;
- Contamination of the soil from; the preparation of chemicals, wash down/ cleaning of equipment, refuelling of vehicles and dumping of waste;
- Compaction of the root zone from haul roads and the parking of vehicles/ plant equipment;
- Root disturbance from cut and fill and soil level changes;
- Physical damage to the tree trunks and branches from passing machinery;
- Damage to the tree roots from landscaping and pedestrian pathway construction.

The following Section provides specific recommendations and proposed measures that aim to minimise and avoid these impacts as much as realistically possible.

3.0 RECOMMENDATIONS

3.1 Potential Amendments to Site Layout and Design

The landscape concept design and proposed building layout have been developed in consultation with the Client and Architects. Arterra, as both the consulting arborists and landscape architects for the project have aimed to minimise the impact on the existing site trees to be retained and the design has been modified to this effect wherever possible. The trees noted for removal, as well as those to be retained, have been given careful consideration and recommendation for removal has not been given lightly.

As the current design has been developed in consultation with the consulting arborist and ecologist, appropriate changes have been implemented throughout the design development process to accommodate existing trees wherever possible. On this basis there are no recommendations to alter the design further at this time.

3.2 Key Recommendations to Reduce Tree Impacts

The following recommendations are made to potentially reduce the negative construction impacts on the trees.

- Minimise re-grading of the roadside verge along the Cooyong Road and Laitoki Road frontages in order to minimise tree impacts.
- Where trees are to be removed adjacent to trees to be retained, tree removal is to be carried out carefully, in a manner that minimises impacts to surrounding trees and vegetation, not grubbed out or felled using excavators or other heavy machinery.
- Appropriately fence all TPZs outside of the incursion for the duration of all major site construction work. See Appendix 4.2 – T-04 & T05 'Tree Protection & Removal Plans' for locations and Tree Protection Specification & Tree Schedule for implementation.
- Carefully control and fence access to and from the construction area so that movement does not occur through any TPZ.
- Ensure all the above and below ground services are excluded from running through any TPZs beyond any noted incursions.
- Minimise the re-grading of the ground surface within the TPZs to meet and match proposed pathways and building levels. Where it is required, limit it to a maximum depth of 300mm above existing ground levels and ensure it is only quality sandy manufactured organic garden mix.
- Mulching of the entire TPZ for all retained trees. This will aid tree health with moisture retention, remove competition from grasses, and improve soil condition within the TPZs.
- Avoid digging into existing root zones for the installation of any proposed landscaping around the trees and installation sizes of new plants to be 5L or less to ensure that excavations are less than 200mm in depth. Build up soil levels when planting to a maximum of 300mm to enable the planting to occur without disturbing roots.
- Do not allow storage or stockpiling of any materials or site sheds within established TPZs unless it can be demonstrated that this will not impact on the tree retention and is approved in writing by the project Consulting Arborist.

3.3 Proposed Tree Protection & Construction Activity Sequencing

The following sequence of activities should be followed for this project: -

1. A Tree Protection Specification & Plan be prepared and issued as part of the construction contract prior to any construction work.
2. Project Consulting Arborist, Landscape Architect, Civil and Structural Engineers, Client and Contractor Site Foreman are to meet prior to beginning any work on the site to discuss and review all work procedures, construction access routes, stockpiling and tree protection measures (ie: fence types and locations, access, craneage points, piling methods etc.).
3. Contractor's to discuss locations and type of any sediment and erosion controls (if any) and install them with minimal tree impact when within or passing through the TPZ.
4. Existing pathways, fences, driveways, furniture and shrubs are to be carefully removed from within the TPZ.
5. Existing surrounding trees are to be removed. Stumps are to be ground to avoid the use of excavators and the like from grubbing out stumps, which may lead to damage of any intertwined roots.
6. Designated TPZs are to be mulched with a minimum of 50mm and a maximum of 75mm of recycled hardwood woodchip mulch to improve soil conditions around tree and remain in place until future landscaping.
7. The Construction Phase TPZ is to be defined and fenced off with a 1.8m high metal or plywood temporary fence prior to any further work within the vicinity of the trees. Any required rumble boards installed to protect TPZ areas where access is required.
8. A utility Arborist is to undertake selective pruning of canopy or branches to facilitate construction of the building and the use of any large scale piling equipment without accidental damage to the tree canopy.

- Pruning to be done in accordance with AS4373 - Pruning of Amenity Trees and performed by staff with minimum AQF 3 qualification.
9. Plywood is to be placed under any scaffolds or works paths when running through TPZs
 10. Building works to be completed (external).
 11. Contractor to remove the TPZ fencing and then install final pathways and landscaping within the TPZ under the trees, after construction of the building exterior is completed.

3.4 Other Tree Protection Measures to be Implemented

The following is a summary of the main measures that will be required during construction. These should be adopted for the Construction Contract and conditioned by Council by way of referencing this report.

Controlled Construction Access & Parking

Construction access points and stockpiling and storage areas shall be clearly identified and fenced where appropriate. Uncontrolled access points and parking of vehicles outside of designated areas is to be avoided. If temporary access is required through a tree protection zone, ground protection shall be employed to limit soil compaction and root damage and disturbance.

Clearing and Removal of Trees to be Removed

Removal and clearing of existing trees should be done by qualified arboricultural staff with care not to impact or damage other surrounding trees throughout the process. Existing stumps should be grubbed out or ground in a controlled fashion to remove wood that may decay and promote unwanted pathogens.

Communication - Tool Box Meetings and Construction Inductions

All contractors and subcontractors shall be inducted prior to working on the site. All inductions shall include description and identification of the Tree Protection Zones and the restriction on work and activities with regard to trees. The site foreman shall ensure that all new staff and contractors are appropriately inducted and that brief "tool box" meetings are conducted regularly to ensure Tree Protection is maintained at the forefront of all construction workers minds.

3.5 References

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- End of report.

4.0 APPENDICES

4.1 Tree Impact & Assessment Schedule

58 Laitoki Road, Terrey Hills - Tree Impact Assessment Schedule

Tree ID	No. of Trees in group	Tree Species	Common Name	Height (m)	Trunk Diameter at Breast Height (dbh) (m)	Trunk Diameter at base (dgl) (m)	Nominal TPZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Age Class	Current Vigour	Current Form	Tree Origin	Noted Defects	SULE Rating	Retention Value	General Comments and Notes	Incursion and Impact	Recommendation
108	1	Eucalyptus sieberi	Black Ash	10.6	0.50	0.63	6.00	2.73	Mature	Good	Good	Endemic	Deadwood-Minor	Long (>40 years)	High	Street tree.	Potential incursion - due to construction of new road alignment and kerb.Minimal impact expected due to existing road	Retain and Protect
109	1	Acacia parramattensis	Parramatta Wattle	9.8	0.32	0.38	3.84	2.20	Mature	Fair	Good	Endemic	Deadwood-Minor	Medium (15-40 years)	Moderate	Street tree.	Minor incursion - due to construction of new road alignment and kerb.	Retain and Protect
110	1	Allocasuarina littoralis	Black She-Oak	8.0	0.08	0.13	2.00	1.40	Young	Fair	Average	Endemic		Medium (15-40 years)	Low	Street tree.		Retain and Protect
111	1	Allocasuarina littoralis	Black She-Oak	7.5	0.14	0.24	2.00	1.82	Semi-mature	Fair	Poor	Endemic		Medium (15-40 years)	Low	Street tree. Growing at side of Telstra pit. Two saplings intertwined from the base.		Retain and Protect
112	1	Allocasuarina littoralis	Black She-Oak	7.5	0.23	0.31	2.76	2.02	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Street tree.		Retain and Protect
113	1	Eucalyptus sieberi	Black Ash	13.0	0.57	0.75	6.84	2.93	Mature	Fair	Average	Endemic	Deadwood-Major, Tip Dieback	Medium (15-40 years)	Moderate	Street tree. Significant deadwood. Growing on edge of roadside embankment.	Major incursion - due to construction of new road alignment and kerb.	Retain and Protect
114	1	Allocasuarina littoralis	Black She-Oak	7.0	0.16	0.23	2.00	1.79	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Street tree.		Retain and Protect
115	1	Allocasuarina littoralis	Black She-Oak	6.0	0.10	0.15	2.00	1.49	Semi-mature	Good	Average	Endemic	Asymmetric Canopy, Lean-Minor	Medium (15-40 years)	Moderate	Street tree.		Retain and Protect
116	1	Eucalyptus sieberi	Black Ash	8.5	0.22	0.27	2.64	1.91	Semi-mature	Fair	Average	Endemic	Lean-Minor, Asymmetric Canopy	Long (>40 years)	Moderate	Street tree. Growing in roadside embankment	Minor incursion - due to construction of new road alignment and kerb.	Retain and Protect
117	1	Allocasuarina littoralis	Black She-Oak	7.0	0.14	0.24	2.00	1.82	Mature	Moribund	Average	Endemic	Tip Dieback	Short (5-15 years)	V Low / Remove	Street tree. Two stems one historically broken out. Very poor condition.		Remove
118	1	Eucalyptus sieberi	Black Ash	8.0	0.28	0.42	3.36	2.30	Mature	Fair	Average	Endemic	Lean-Minor, Asymmetric Canopy, Deadwood-Minor, Epicormic Growth	Long (>40 years)	Moderate	Growing in close proximity to 119. Lean and canopy to north-east.		Retain and Protect
119	1	Eucalyptus sieberi	Black Ash	11.5	0.41	0.55	4.92	2.57	Mature	Fair	Average	Endemic	Asymmetric Canopy, Deadwood-Minor, Epicormic Growth, Lean-Major, Co-dominant Stems	Long (>40 years)	Low	Growing in close proximity to 118. Major lean and canopy to north.		Retain and Protect
120	1	Acacia parramattensis	Parramatta Wattle	6.5	0.15	0.20	2.00	1.68	Mature	Fair	Average	Endemic	Deadwood-Minor, Pest/Disease	Short (5-15 years)	Low	Borer activity and frass noted in lower trunk. Poor Tree - Should remove		Remove
121	1	Eucalyptus sieberi	Black Ash	11.5	0.55	1.04	6.60	3.36	Mature	Fair	Average	Endemic	Asymmetric Canopy, Deadwood-Minor, Co-dominant Stems, Lean-Minor	Long (>40 years)	Moderate	Lean and canopy to north.		Retain and Protect
122	1	Eucalyptus sieberi	Black Ash	13.0	0.87	0.98	10.44	3.28	Mature	Poor	Average	Endemic	Epicormic Growth, Tip Dieback, Deadwood-Major, Decay-Minor	Medium (15-40 years)	Low	Extensive dieback. Gaults and dysfunction at base. Decay and wound at base of trunk on north-west.	Potential incursion - due to construction of new road alignment and kerb. Minimal impact expected due to existing road and position	Retain and Protect
123	1	Xylomelum pyrifforme	Woody Pear	6.0	0.15	0.26	2.00	1.88	Mature	Fair	Good	Endemic		Medium (15-40 years)	High	Street tree. Large and mature specimen of uncommon endemic understorey species.		Retain and Protect
124	1	Hakea salicifolia	Willow-leaved Hakea	6.0	0.17	0.20	2.04	1.68	Mature	Fair	Average	Native		Medium (15-40 years)	Low	Growing intertwined with Acacia saligna.		Retain and Protect
125	1	Cotoneaster glaucophyllus	Cotoneaster	7.5	0.20	0.30	2.40	2.00	Mature	Excellent	Average	Invasive		Medium (15-40 years)	V Low / Remove	Street tree. Weedy and exempt species. Should be removed.	Exempt Species	Remove
126	1	Corymbia gummifera	Red Bloodwood	7.5	0.22	0.28	2.64	1.94	Mature	Fair	Poor	Endemic	Lean-Minor, Deadwood-Minor	Medium (15-40 years)	Moderate	Street tree growing under power lines. Very elongated specimen now clearing power lines. .		Retain and Protect
127	1	Pittosporum undulatum	Sweet Pittosporum	7.5	0.16	0.20	2.00	1.68	Over-mature	Poor	Poor	Endemic		Short (5-15 years)	Low	Street tree growing under power lines. Poor specimen - Should remove.		Remove
128	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.5	0.15	0.23	2.00	1.79	Mature	Good	Poor	Endemic	Poor Taper	Medium (15-40 years)	Low	Street tree growing under power lines. Lopped for powerline clearances.		Retain and Protect
129	6	Ceratopetalum gummiferum	New South Wales Christmas Bush	11.5	0.53	1.60	6.36	4.03	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Copse growing together. Multi-trunks from base. 6 individuals.		Retain and Protect
130	1	Allocasuarina littoralis	Black She-Oak	7.0	0.14	0.20	2.00	1.68	Mature	Fair	Average	Endemic	Deadwood-Minor	Medium (15-40 years)	Low		In construction footprint	Remove
131	1	Acacia parramattensis	Parramatta Wattle	9.0	0.24	0.28	2.88	1.94	Mature	Fair	Poor	Endemic	Deadwood-Minor, Pest/Disease, Tip Dieback	Medium (15-40 years)	Low	Extensive dieback.	In construction footprint	Remove
132	1	Eucalyptus sieberi	Black Ash	11.0	0.26	0.33	3.12	2.08	Semi-mature	Good	Average	Endemic		Long (>40 years)	High		In construction footprint	Remove
133	6	Ceratopetalum gummiferum	New South Wales Christmas Bush	11.5	0.16	0.22	2.00	1.75	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Group of 6 individuals.		Retain and Protect
134	5	Ceratopetalum gummiferum	New South Wales Christmas Bush	11.5	0.13	0.17	2.00	1.57	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Group of 5 individuals.		Retain and Protect
135	1	Pittosporum undulatum	Sweet Pittosporum	7.0	0.30	0.31	3.60	2.02	Mature	Fair	Average	Endemic	Epicormic Growth, Deadwood-Minor, Tip Dieback	Medium (15-40 years)	Low		Major incursion - significant impact due to construction.	Remove
136	5	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.10	0.16	2.00	1.53	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Street tree growing under power lines. Group of 5 individuals. Lopped for powerline clearance, some now growing past and above lines.		Retain and Protect
137	3	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.31	0.80	3.72	3.01	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Street tree growing under power lines. Group of 3 individuals. Lopped for powerline clearance. Now growing past and above lines.	Within line of new kerb and gutter.	Remove
138	5	Ceratopetalum gummiferum	New South Wales Christmas Bush	12.0	0.15	0.20	2.00	1.68	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Street tree growing under power lines. Group of 5 individuals. Previously lopped for powerline clearance. Numerous weeds	Within line of new kerb and gutter.	Remove
139	4	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.15	0.20	2.00	1.68	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Street tree growing under power lines. Group of 4 individuals. Historically lopped for powerline clearance. Numerous weeds		Retain and Protect
140	1	Eucalyptus sieberi	Black Ash	10.5	0.30	0.45	3.60	2.37	Senescent	Moribund	Poor	Endemic	Tip Dieback, Asymmetric Canopy, Deadwood-Major	Long (>40 years)	V Low / Remove	Street tree growing under power lines. Very poor condition and overhanging wires. Should be removed.	Very Poor Tree - Should remove	Remove
141	1	Araucaria columnaris	Cook Pine	12.4	0.33	0.38	3.96	2.20	Semi-mature	Good	Average	Exotic		Long (>40 years)	Moderate	Street tree growing near power lines.	Within line of new kerb and gutter.	Remove
142	1	Pittosporum undulatum	Sweet Pittosporum	7.5	0.31	0.42	3.72	2.30	Mature	Fair	Average	Endemic		Medium (15-40 years)	Low	Street tree growing under power lines.		Remove
143	1	Acacia parramattensis	Parramatta Wattle	12.5	0.40	0.53	4.80	2.53	Mature	Good	Average	Endemic	Deadwood-Minor, Pest/Disease, Branch Tearouts	Medium (15-40 years)	Moderate	Large branch tear out to north at 4-6m	Major incursion - significant impact due to construction.	Remove
144	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.16	0.20	2.00	1.68	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate		Major incursion - significant impact due to construction.	Remove
145	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	8.0	0.10	0.11	2.00	1.31	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate		Major incursion - significant impact due to construction.	Remove
146	1	Pittosporum undulatum	Sweet Pittosporum	7.5	0.09	0.10	2.00	1.26	Semi-mature	Fair	Poor	Endemic	Tip Dieback, Poor Taper	Medium (15-40 years)	Low	Very elongated specimen. Minimal foliage.	Major incursion - significant impact due to construction.	Remove

Tree ID	No. of Trees in group	Tree Species	Common Name	Height (m)	Trunk Diameter Breast Height (dbh) (m)	Trunk Diameter at base (dgl) (m)	Nominal TPZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Age Class	Current Vigour	Current Form	Tree Origin	Noted Defects	SULE Rating	Retention Value	General Comments and Notes	Incursion and Impact	Recommendation
147	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.0	0.19	0.22	2.28	1.75	Mature	Good	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate		In construction footprint	Remove
148	1	Pittosporum undulatum	Sweet Pittosporum	8.0	0.21	0.22	2.52	1.75	Mature	Fair	Poor	Endemic	Tip Dieback, Deadwood-Minor	Medium (15-40 years)	Low	Multi-trunked from base.	In construction footprint	Remove
149	1	Pittosporum undulatum	Sweet Pittosporum	8.5	0.24	0.30	2.88	2.00	Mature	Fair	Average	Endemic	Tip Dieback, Deadwood-Minor	Medium (15-40 years)	Low		Major incursion - significant impact due to construction.	Remove
150	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.5	0.08	0.10	2.00	1.26	Mature	Fair	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Very elongated specimen, minimal foliage.		Retain and Protect
151	2	Pittosporum undulatum	Sweet Pittosporum	7.5	0.12	0.15	2.00	1.49	Mature	Fair	Average	Endemic	Tip Dieback, Deadwood-Minor	Medium (15-40 years)	Low			Remove
152	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.5	0.14	0.20	2.00	1.68	Mature	Fair	Average	Endemic	Poor Taper	Medium (15-40 years)	Moderate	Dead sapling adjoining and surrounded by weeds.	In construction footprint	Remove
153	1	Pittosporum undulatum	Sweet Pittosporum	6.5	0.20	0.24	2.40	1.82	Mature	Good	Average	Endemic		Medium (15-40 years)	Low		In construction footprint	Remove
154	1	Pittosporum undulatum	Sweet Pittosporum	6.5	0.22	0.28	2.64	1.94	Mature	Good	Average	Endemic		Medium (15-40 years)	Low		In building footprint	Remove
155	1	Pittosporum undulatum	Sweet Pittosporum	5.0	0.18	0.29	2.16	1.97	Mature	Good	Average	Endemic		Medium (15-40 years)	Low		In building footprint	Remove
156	1	Corymbia gummifera	Red Bloodwood	16.0	0.57	0.62	6.84	2.71	Mature	Poor	Average	Endemic	Tip Dieback, Deadwood-Major, Epicormic Growth	Short (5-15 years)	V Low / Remove	Very sparse canopy, extensive dieback and deadwood. Much of the foliage dessicated.	Very Poor Tree - Should remove. In building footprint	Remove
157	1	Pittosporum undulatum	Sweet Pittosporum	5.5	0.20	0.23	2.40	1.79	Mature	Good	Average	Endemic		Medium (15-40 years)	Low	Growing in close proximity to 158 to north.	In building footprint	Remove
158	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	5.5	0.17	0.19	2.04	1.65	Mature	Good	Average	Endemic	Asymmetric Canopy	Medium (15-40 years)	Moderate	Growing in close proximity to 157 to south.	In building footprint	Remove
159	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	6.0	0.11	0.15	2.00	1.49	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate		In building footprint	Remove
160	1	Banksia serrata	Old Man Banksia	6.0	0.22	0.35	2.64	2.13	Mature	Fair	Average	Endemic	Asymmetric Canopy, Branch Tearouts	Medium (15-40 years)	Moderate		In building footprint	Remove
161	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.0	0.15	0.18	2.00	1.61	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Wounding to trunk at 1m	In building footprint	Remove
162	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.0	0.13	0.17	2.00	1.57	Mature	Good	Average	Endemic	Lean-Minor	Medium (15-40 years)	Moderate		In building footprint	Remove
163	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.0	0.15	0.20	2.00	1.68	Mature	Good	Average	Endemic	Lean-Minor	Medium (15-40 years)	Moderate	Top leader broken, otherwise OK.	In building footprint	Remove
164	1	Acacia parramattensis	Parramatta Wattle	12.5	0.28	0.40	3.36	2.25	Mature	Good	Average	Endemic	Deadwood-Minor, Pest/Disease, Lean-Major, Root Impacts, Asymmetric Canopy	Short (5-15 years)	Low	Major lean to north-west.	In building footprint	Remove
165	1	Corymbia gummifera	Red Bloodwood	16.0	0.39	0.51	4.68	2.49	Mature	Fair	Good	Endemic	Deadwood-Major, Tip Dieback	Medium (15-40 years)	Moderate	Sparse canopy, extensive dieback and deadwood.	In construction footprint	Remove
166	1	Pittosporum undulatum	Sweet Pittosporum	9.5	0.14	0.17	2.00	1.57	Mature	Good	Average	Endemic		Medium (15-40 years)	Low		In building footprint	Remove
167	5	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.0	0.12	0.16	2.00	1.53	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate		In building footprint	Remove
168	1	Pittosporum undulatum	Sweet Pittosporum	8.0	0.13	0.15	2.00	1.49	Mature	Good	Average	Endemic		Medium (15-40 years)	Low		In construction footprint	Remove
169	3	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.17	0.24	2.04	1.82	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
170	3	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.15	0.21	2.00	1.72	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
171	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.22	0.28	2.64	1.94	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
172	1	Pittosporum undulatum	Sweet Pittosporum	8.0	0.19	0.22	2.28	1.75	Mature	Fair	Average	Endemic	Deadwood-Minor	Medium (15-40 years)	Low	Poor Tree - Should remove		Remove
173	1	Pittosporum undulatum	Sweet Pittosporum	8.0	0.23	0.26	2.76	1.88	Mature	Fair	Average	Endemic	Deadwood-Minor	Medium (15-40 years)	Low	Poor Tree - Should remove		Remove
174	2	Pittosporum undulatum	Sweet Pittosporum	8.5	0.22	0.33	2.64	2.08	Mature	Fair	Average	Endemic	Deadwood-Minor	Medium (15-40 years)	Low	Poor Tree - Should remove		Remove
175	2	Pittosporum undulatum	Sweet Pittosporum	8.5	0.14	0.18	2.00	1.61	Mature	Fair	Average	Endemic	Deadwood-Minor	Medium (15-40 years)	Low	Poor Tree - Should remove		Remove
176	2	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.17	0.23	2.04	1.79	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Growing amongst dead trees.		Retain and Protect
177	2	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.17	0.23	2.04	1.79	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
178	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.14	0.20	2.00	1.68	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
179	5	Ceratopetalum gummiferum	New South Wales Christmas Bush	9.5	0.16	0.22	2.00	1.75	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Group growing amongst other dead trees and numerous weeds and smaller Pittosporum undulatum.		Retain and Protect
180	1	Pittosporum undulatum	Sweet Pittosporum	8.0	0.21	0.26	2.52	1.88	Mature	Poor	Average	Endemic	Deadwood-Minor	Medium (15-40 years)	Low	Poor Tree - Should remove		Remove
181	1	Pittosporum undulatum	Sweet Pittosporum	8.0	0.18	0.23	2.16	1.79	Mature	Fair	Poor	Endemic	Deadwood-Minor, Asymmetric Canopy	Medium (15-40 years)	Low	Growing at base of larger dead tree.		Remove
182	1	Allocasuarina littoralis	Black She-Oak	8.5	0.22	0.28	2.64	1.94	Mature	Fair	Poor	Endemic	Asymmetric Canopy, Lean-Minor	Medium (15-40 years)	Low			Retain and Protect
183	1	Ceratopetalum gummiferum	New South Wales Christmas Bush	7.5	0.12	0.17	2.00	1.57	Semi-mature	Good	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
184	1	Allocasuarina littoralis	Black She-Oak	9.0	0.10	0.15	2.00	1.49	Semi-mature	Fair	Poor	Endemic	Asymmetric Canopy	Medium (15-40 years)	Moderate			Retain and Protect
185	2	Pittosporum undulatum	Sweet Pittosporum	6.5	0.14	0.22	2.00	1.75	Mature	Fair	Poor	Endemic	Deadwood-Minor	Medium (15-40 years)	Low	Covered in lantana. Poor tree - should remove		Remove
186	1	Angophora costata	Smooth-barked Apple	9.0	0.30	0.35	3.60	2.13	Mature	Fair	Poor	Endemic	Deadwood-Major	Short (5-15 years)	Low	Extensive basal wounding. Extensive dieback and deadwood.	In construction footprint	Remove

Tree ID	No. of Trees in group	Tree Species	Common Name	Height (m)	Trunk Diameter Breast Height (dbh) (m)	Trunk Diameter at base (dgl) (m)	Nominal TPZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Age Class	Current Vigour	Current Form	Tree Origin	Noted Defects	SULE Rating	Retention Value	General Comments and Notes	Incursion and Impact	Recommendation
187	1	Ficus benjamina	Weeping Fig	9.0	1.00	1.00	12.00	3.31	Mature	Fair	Average	Exotic		Long (>40 years)	Low	Chlorotic foliage. Exempt species.	In building footprint	Remove
188	1	Eucalyptus sieberi	Black Ash	11.0	0.60	0.72	7.20	2.88	Mature	Good	Good	Endemic	Deadwood-Major	Long (>40 years)	High	Need to deadwood if retained, otherwise good tree. Smaller Callistemon growing at base.	In building footprint	Remove
189	1	Eucalyptus camaldulensis?	River Red Gum	11.0	0.73	1.03	8.76	3.35	Mature	Good	Good	Native	Deadwood-Major	Long (>40 years)	High	Need to deadwood if retained, otherwise good tree, but nontendemic. No fruit available for positive ID.	In construction footprint	Remove
190	9	Allocasuarina littoralis	Black She-Oak	9.0	0.13	0.18	2.00	1.61	Semi-mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Growing in a group around a significant level change at boundary and driveway corner.		Retain and Protect
191	1	Allocasuarina littoralis	Black She-Oak	9.5	0.29	0.33	3.48	2.08	Mature	Good	Average	Endemic		Medium (15-40 years)	High	Growing in a group around significant level change at boundary and driveway corner. Smaller specimen to its north has failed at rootplate.		Retain and Protect
192	2	Allocasuarina littoralis	Black She-Oak	9.5	0.25	0.30	3.00	2.00	Mature	Good	Average	Endemic	Tip Dieback	Medium (15-40 years)	Moderate	Growing in a group around significant level change, and base of rock outcrop.	Major incursion - significant impact due to construction.	Remove
193	1	Eucalyptus sieberi	Black Ash	9.0	0.31	0.36	3.72	2.15	Mature	Good	Poor	Endemic	Lean-Major, Asymmetric Canopy	Long (>40 years)	Moderate	Significant lean to north. Very asymmetric canopy.	In construction footprint	Remove
194	1	Allocasuarina littoralis	Black She-Oak	9.5	0.20	0.25	2.40	1.85	Mature	Good	Average	Endemic		Medium (15-40 years)	High		In building footprint	Remove
195	3	Allocasuarina littoralis	Black She-Oak	8.0	0.10	0.19	2.00	1.65	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Group growing at top of rock outcrop.		Retain and Protect
196	1	Eucalyptus sieberi	Black Ash	8.5	0.11	0.16	2.00	1.53	Young	Fair	Average	Endemic	Asymmetric Canopy	Long (>40 years)	Moderate	Small sapling growing amongst other vegetation and weeds.	Major incursion - significant impact due to construction.	Remove
197	1	Eucalyptus sieberi	Black Ash	15.0	0.41	0.49	4.92	2.45	Mature	Fair	Average	Endemic	Tip Dieback, Deadwood-Minor	Long (>40 years)	Moderate	Sparse canopy and some tip dieback.	Major incursion - significant impact due to construction.	Remove
198	1	Pittosporum undulatum	Sweet Pittosporum	7.0	0.16	0.20	2.00	1.68	Mature	Fair	Average	Endemic	Deadwood-Minor	Medium (15-40 years)	Low	Covered in lantana.	In construction footprint	Remove
199	1	Eucalyptus capillata	Brown Stringybark	14.0	0.27	0.32	3.24	2.05	Mature	Fair	Average	Endemic		Long (>40 years)	Moderate		In construction footprint	Remove
200	1	Acacia parramattensis	Parramatta Wattle	13.5	0.29	0.39	3.48	2.23	Mature	Good	Average	Endemic	Asymmetric Canopy	Medium (15-40 years)	Moderate		In construction footprint	Remove
201	1	Eucalyptus capillata	Brown Stringybark	10.0	0.34	0.50	4.08	2.47	Mature	Good	Average	Endemic	Deadwood-Minor	Long (>40 years)	High			Retain and Protect
202	1	Eucalyptus sieberi	Black Ash	15.5	0.78	0.80	9.36	3.01	Mature	Good	Good	Endemic	Deadwood-Minor	Long (>40 years)	High	One of the beter trees on the site.	Major incursion - significant impact due to construction.	Remove
203	1	Allocasuarina littoralis	Black She-Oak	6.5	0.13	0.19	2.00	1.65	Mature	Fair	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
204	3	Corymbia citriodora	Lemon Scented Gum	16.5	0.40	0.50	4.80	2.47	Mature	Good	Good	Native		Long (>40 years)	High	One of the better trees on the site. Parent tree with 2 smaller saplings on either side. Not endemic but should be retained.		Retain and Protect
205	1	Eucalyptus sieberi	Black Ash	14.5	0.32	0.48	3.84	2.43	Mature	Good	Good	Endemic	Deadwood-Minor Decay-Minor	Long (>40 years)	High	One of the better trees on the site. Some basal wounding but good reaction wood occurring.		Retain and Protect
206	1	Eucalyptus camaldulensis?	River Red Gum	11.0	0.37	0.48	4.44	2.43	Mature	Good	Good	Native	Deadwood-Major	Long (>40 years)	High	Need to deadwood if retained. No fruit available for positive ID. Not endemic but otherwise good tree.		Retain and Protect
207	1	Corymbia gummifera	Red Bloodwood	12.0	0.22	0.26	2.64	1.88	Mature	Good	Good	Endemic		Long (>40 years)	High			Retain and Protect
208	1	Corymbia gummifera	Red Bloodwood	16.0	0.57	0.70	6.84	2.85	Mature	Good	Good	Endemic	Deadwood-Minor	Long (>40 years)	Moderate		Minor incursion - due to construction of new road alignment and kerb.	Retain and Protect
209	1	Allocasuarina littoralis	Black She-Oak	9.0	0.19	0.26	2.28	1.88	Mature	Fair	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
210	1	Eucalyptus sieberi	Black Ash	9.5	0.22	0.27	2.64	1.91	Semi-mature	Good	Average	Endemic	Lean-Minor, Asymmetric Canopy	Long (>40 years)	High	Lean and canopy to north.		Retain and Protect
211	1	Eucalyptus sieberi	Black Ash	9.5	0.20	0.25	2.40	1.85	Semi-mature	Good	Poor	Endemic	Asymmetric Canopy, Lean-Major	Long (>40 years)	Moderate	Signicant lean and canopy to north.		Retain and Protect
212	1	Corymbia gummifera	Red Bloodwood	9.5	0.23	0.30	2.76	2.00	Semi-mature	Fair	Average	Endemic	Deadwood-Major	Long (>40 years)	Moderate			Retain and Protect
213	2	Allocasuarina littoralis	Black She-Oak	9.0	0.14	0.20	2.00	1.68	Mature	Fair	Average	Endemic		Medium (15-40 years)	Moderate			Retain and Protect
214	1	Eucalyptus sieberi	Black Ash	16.0	0.68	0.68	8.16	2.81	Mature	Good	Good	Endemic	Deadwood-Minor	Long (>40 years)	High	One of the better trees on the site.	Minor incursion - due to construction of new road alignment and kerb.	Retain and Protect
215	1	Eucalyptus oblonga	Narrow-leaved Stringybark	7.5	0.22	0.35	2.64	2.13	Mature	Poor	Poor	Endemic	Lean-Major, Tip Dieback, Deadwood-Major	Long (>40 years)	Low	Surrounded by weeds, very distorted growth habit, extensive dieback and sparse canopy.		Remove
216	1	Pittosporum undulatum	Sweet Pittosporum	8.5	0.26	0.40	3.12	2.25	Mature	Good	Average	Endemic		Medium (15-40 years)	Low			Remove
217	1	Eucalyptus sieberi	Black Ash	9.5	0.49	0.80	5.88	3.01	Mature	Good	Average	Endemic	Inclusions, Co-dominant Stems	Long (>40 years)	High	Codominant stems with inclusion, but otherwise good tree.	In construction footprint	Remove
218	1	Banksia serrata	Old Man Banksia	9.5	0.52	0.90	6.24	3.17	Mature	Fair	Average	Endemic	Deadwood-Major	Long (>40 years)	Moderate	Pittosporum growing through and in the middle of tree.	In construction footprint	Remove
219	1	Eucalyptus sieberi	Black Ash	7.0	0.09	0.12	2.00	1.36	Young	Good	Good	Endemic		Long (>40 years)	Moderate		In construction footprint	Remove
220	1	Eucalyptus sieberi	Black Ash	12.0	0.39	0.43	4.68	2.32	Mature	Good	Good	Endemic	Inclusions, Co-dominant Stems, Lean-Minor	Long (>40 years)	High	Minor lean to north.	In construction footprint	Remove
221	1	Eucalyptus sieberi	Black Ash	12.0	0.40	0.55	4.80	2.57	Mature	Good	Good	Endemic	Inclusions, Co-dominant Stems	Long (>40 years)	High	Good tree.	In construction footprint	Remove
222	1	Pittosporum undulatum	Sweet Pittosporum	8.0	0.31	0.40	3.72	2.25	Mature	Fair	Average	Endemic		Medium (15-40 years)	Low	Gowing in raised garden bed right next to house structure.	In construction footprint	Remove
223	1	Banksia serrata	Old Man Banksia	8.0	0.43	0.58	5.16	2.63	Mature	Fair	Average	Endemic	Deadwood-Minor	Short (5-15 years)	Low	Sparse foliage.	In construction footprint	Remove
224	1	Banksia serrata	Old Man Banksia	8.5	0.38	0.46	4.56	2.39	Mature	Good	Average	Endemic		Long (>40 years)	High		In construction footprint	Remove
225	3	Cinnamomum camphora	Camphor Laurel	9.0	0.49	0.64	5.88	2.74	Mature	Fair	Average	Invasive	Tip Dieback	Long (>40 years)	V Low / Remove	Invasive species, should remove..	Invasive species - Should remove.	Remove
226	1	Pittosporum undulatum	Sweet Pittosporum	6.5	0.19	0.26	2.28	1.88	Mature	Poor	Poor	Endemic	Tip Dieback	Medium (15-40 years)	Low	Poor specimen - Should remove.		Remove

Tree ID	No. of Trees in group	Tree Species	Common Name	Height (m)	Trunk Diameter Breast Height (dbh) (m)	Trunk Diameter at base (dgl) (m)	Nominal TPZ radius (m) 12xdbh (AS 4970)	Nominal SRZ radius (m) (AS 4970)	Age Class	Current Vigour	Current Form	Tree Origin	Noted Defects	SULE Rating	Retention Value	General Comments and Notes	Incursion and Impact	Recommendation
227	3	Pittosporum undulatum	Sweet Pittosporum	6.5	0.22	0.28	2.64	1.94	Mature	Poor	Poor	Endemic	Tip Dieback	Medium (15-40 years)	Low		In construction footprint	Remove
228	1	Banksia serrata	Old Man Banksia	7.0	0.26	0.35	3.12	2.13	Mature	Good	Average	Endemic		Long (>40 years)	High		In construction footprint	Remove
229	1	Banksia serrata	Old Man Banksia	8.5	0.38	0.48	4.56	2.43	Mature	Good	Average	Endemic		Long (>40 years)	High			Retain and Protect
230	1	Corymbia gummifera	Red Bloodwood	18.0	0.40	0.49	4.80	2.45	Mature	Fair	Average	Endemic	Asymmetric Canopy, Deadwood-Minor	Long (>40 years)	High			Retain and Protect
231	1	Pittosporum undulatum	Sweet Pittosporum	6.5	0.24	0.32	2.88	2.05	Mature	Fair	Average	Endemic	Tip Dieback	Medium (15-40 years)	Low	Nearby tree fallen through and leaning on the tree. 2 possums observed in foliage.		Remove
232	1	Eucalyptus sieberi	Black Ash	9.5	0.30	0.42	3.60	2.30	Mature	Good	Poor	Endemic	Root Impacts, Lean-Major, Asymmetric Canopy	Long (>40 years)	V Low / Remove	Partial root plate failure observed and tree leaning on fence and over roadway. Tree should be removed.	Very Poor Tree - Should remove	Remove
233	1	Eucalyptus sieberi	Black Ash	9.5	0.20	0.24	2.40	1.82	Semi-mature	Good	Average	Endemic		Long (>40 years)	High			Retain and Protect
234	1	Pittosporum undulatum	Sweet Pittosporum	6.5	0.25	0.25	3.00	1.85	Mature	Fair	Poor	Endemic	Tip Dieback	Medium (15-40 years)	Low	Growing out of old tree stumps. Poor specimen - should remove.	In construction footprint	Remove
235	1	Banksia serrata	Old Man Banksia	8.5	0.30	0.34	3.60	2.10	Mature	Good	Average	Endemic		Long (>40 years)	High		In construction footprint	Remove
236	1	Eucalyptus haemastoma	Scribbly Gum	8.5	0.55	0.66	6.60	2.78	Mature	Good	Average	Endemic	Deadwood-Minor	Long (>40 years)	High	Some damage at branch junctions, most likely parrot damage.	In construction footprint	Remove
237	1	Corymbia gummifera	Red Bloodwood	10.0	0.25	0.31	3.00	2.02	Semi-mature	Good	Good	Endemic		Long (>40 years)	High	Good semi-mature tree.		Retain and Protect
238	1	Eucalyptus haemastoma	Scribbly Gum	8.5	0.29	0.35	3.48	2.13	Mature	Good	Poor	Endemic	Lean-Major	Long (>40 years)	Moderate	Major lean and asymmetric canopy.	In construction footprint	Remove
239	1	Corymbia gummifera	Red Bloodwood	7.0	0.12	0.20	2.00	1.68	Young	Good	Average	Endemic	Lean-Major	Long (>40 years)	Moderate		Major incursion - significant impact due to construction.	Remove
240	1	Eucalyptus oblonga	Narrow-leaved Stringybark	7.5	0.18	0.25	2.16	1.85	Mature	Fair	Poor	Endemic	Deadwood-Major, Tip Dieback	Medium (15-40 years)	Moderate	Very contorted habit and extensive deadwood and dieback. Living parts of canopy appear vigorous.	In construction footprint	Remove
241	1	Acacia parramattensis	Parramatta Wattle	9.5	0.45	0.60	5.40	2.67	Senescent	Moribund	Average	Endemic	Deadwood-Major, Tip Dieback, Pest/Disease	Remove (<5 years)	V Low / Remove		Very Poor Tree - Should remove	Remove
242	1	Eucalyptus sieberi?	Black Ash	7.5	0.42	0.60	5.04	2.67	Semi-mature	Fair	Average	Endemic	Deadwood-Major, Tip Dieback, Pest/Disease, Co-dominant Stems	Short (5-15 years)	Low	3 separate stems, one of which is dead. Poor tree - Should remove.	Very Poor Tree - Should remove	Remove
243	1	Allocasuarina littoralis	Black She-Oak	10.5	0.28	0.50	3.36	2.47	Senescent	Poor	Average	Endemic	Deadwood-Major, Tip Dieback	Short (5-15 years)	Low	Street tree.	In construction footprint	Remove
244	1	Eucalyptus sieberi	Black Ash	15.0	0.48	0.62	5.76	2.71	Mature	Good	Good	Endemic		Long (>40 years)	High	Street tree.	In construction footprint	Remove
245	2	Allocasuarina littoralis	Black She-Oak	12.5	0.20	0.27	2.40	1.91	Mature	Good	Good	Endemic	Deadwood-Major, Tip Dieback	Medium (15-40 years)	High	Street tree.	Major incursion - due to construction of new road alignment and kerb.	Remove
246	1	Allocasuarina littoralis	Black She-Oak	11.5	0.33	0.39	3.96	2.23	Over-mature	Poor	Average	Endemic	Deadwood-Major, Tip Dieback	Short (5-15 years)	Moderate	Street tree.	Major incursion - due to construction of new road alignment and kerb.	Remove
247	1	Eucalyptus sieberi	Black Ash	15.0	0.47	0.57	5.64	2.61	Mature	Good	Good	Endemic		Long (>40 years)	High	Street tree.	Major incursion - due to construction of new road alignment and kerb. Conditionally retain, inspect root disturbance during kerb work.	Retain and Protect
248	1	Allocasuarina littoralis	Black She-Oak	10.0	0.32	0.44	3.84	2.34	Mature	Poor	Average	Endemic	Tip Dieback	Medium (15-40 years)	Moderate	Street tree.		Retain and Protect
249	1	Allocasuarina littoralis	Black She-Oak	11.0	0.26	0.35	3.12	2.13	Mature	Fair	Average	Endemic		Medium (15-40 years)	Moderate	Street tree.		Retain and Protect
250	1	Eucalyptus sieberi	Black Ash	16.0	0.39	0.47	4.68	2.41	Mature	Good	Good	Endemic		Long (>40 years)	High	Street tree.	In line of new kerb	Remove
251	1	Allocasuarina littoralis	Black She-Oak	11.0	0.20	0.28	2.40	1.94	Mature	Fair	Average	Endemic		Medium (15-40 years)	Moderate	Street tree. Eucalyptus seiberi seedling growing directly from the base and leaning to west. Same size as surveyed specimen.	In line of new kerb	Remove
252	1	Allocasuarina littoralis	Black She-Oak	10.0	0.25	0.35	3.00	2.13	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Street tree.	Very close to alignment of new proposed kerb	Remove
253	1	Allocasuarina littoralis	Black She-Oak	10.0	0.20	0.27	2.40	1.91	Mature	Good	Average	Endemic		Medium (15-40 years)	Moderate	Street tree.	Very close to alignment of new proposed kerb	Remove
254	1	Allocasuarina littoralis	Black She-Oak	10.0	0.38	0.46	4.56	2.39	Over-mature	Fair	Poor	Endemic		Short (5-15 years)	Low	Street tree.	Poor Tree - Should remove	Remove
255	1	Acacia parramattensis	Parramatta Wattle	10.0	0.20	0.27	2.40	1.91	Senescent	Poor	Poor	Endemic	Lean-Minor, Deadwood-Major, Tip Dieback	Remove (<5 years)	V Low / Remove	Street tree.	Very Poor Tree - Should remove	Remove
256	5	Allocasuarina littoralis	Black She-Oak	10.0	0.20	0.28	2.40	1.94	Mature	Fair	Poor	Endemic		Medium (15-40 years)	Moderate	Tightly spaced group, surrounded by weeds. Street tree.	In construction footprint	Remove
257	1	Allocasuarina littoralis	Black She-Oak	10.0	0.30	0.37	3.60	2.18	Senescent	Poor	Poor	Endemic	Deadwood-Major, Tip Dieback	Short (5-15 years)	Low	Poor condition. Street tree.		Retain and Protect
258	1	Cinnamomum camphora	Camphor Laurel	8.0	0.29	0.40	3.48	2.25	Semi-mature	Good	Average	Invasive		Long (>40 years)	V Low / Remove	Invasive species, should remove. Street tree.	Invasive species - Should remove.	Remove
259	1	Pittosporum undulatum	Sweet Pittosporum	8.5	0.16	0.20	2.00	1.68	Mature	Fair	Poor	Endemic		Short (5-15 years)	Low	Poorly formed tree, surrounded by weeds. Street tree.		Remove

4.2 Tree Retention Value Plans

ID No.	Tree Species	Common Name	Trunk Diameter (mm)	Trunk Height (m)	Normal TPZ radius (m) (AS 4370)
108	Ecological seedling	Black Ash	0.50	0.63	6.00
109	Acacia panamattensis	Paranatta Wattle	0.32	0.38	3.84
110	Allocasuarina fibrosa	Black She-Oak	0.08	0.13	2.00
111	Allocasuarina fibrosa	Black She-Oak	0.14	0.34	2.00
112	Allocasuarina fibrosa	Black She-Oak	0.22	0.37	2.75
113	Ecological seedling	Black Ash	0.29	0.75	6.48
114	Allocasuarina fibrosa	Black She-Oak	0.18	0.21	2.00
115	Allocasuarina fibrosa	Black She-Oak	0.10	0.15	2.00
116	Ecological seedling	Black Ash	0.20	0.37	2.54
117	Allocasuarina fibrosa	Black She-Oak	0.14	0.34	2.00
118	Ecological seedling	Black Ash	0.28	0.42	3.36
119	Ecological seedling	Black Ash	0.41	0.55	4.92
120	Acacia panamattensis	Paranatta Wattle	0.11	0.25	2.00
121	Ecological seedling	Black Ash	0.50	1.04	6.89
122	Ecological seedling	Black Ash	0.87	0.98	10.44
123	Myrsine pyramis	Woody Rose	0.15	0.26	2.00
124	Hebe salicifolia	Willow-leaved Hebe	0.17	0.26	2.00
125	Colsonella glaucophylla	Colsonella	0.20	0.30	2.40
126	Corymbia gemmifera	Red Bloodwood	0.22	0.38	2.64
127	Philoponium undulatum	Sweet Pittosporum	0.10	0.25	2.00
128	Ceratophyllum demersum	New South Wales Christmas Bush	0.10	0.21	2.00
129	Ceratophyllum demersum	New South Wales Christmas Bush	0.51	1.80	6.36
130	Allocasuarina fibrosa	Black She-Oak	0.14	0.30	2.00
131	Acacia panamattensis	Paranatta Wattle	0.24	0.28	2.88
132	Ecological seedling	Black Ash	0.28	0.33	3.12
133	Ceratophyllum demersum	New South Wales Christmas Bush	0.16	0.22	2.00
134	Ceratophyllum demersum	New South Wales Christmas Bush	0.11	0.17	2.00
135	Philoponium undulatum	Sweet Pittosporum	0.30	0.31	3.60
136	Ceratophyllum demersum	New South Wales Christmas Bush	0.10	0.18	2.00
137	Ceratophyllum demersum	New South Wales Christmas Bush	0.37	0.86	3.12
138	Ceratophyllum demersum	New South Wales Christmas Bush	0.15	0.26	2.00
139	Ceratophyllum demersum	New South Wales Christmas Bush	0.15	0.26	2.00
140	Ecological seedling	Black Ash	0.30	0.45	3.60
141	Acacia salicina	Cock Pine	0.31	0.38	3.96
142	Philoponium undulatum	Sweet Pittosporum	0.37	0.42	3.72
143	Acacia panamattensis	Paranatta Wattle	0.40	0.53	4.80
144	Ceratophyllum demersum	New South Wales Christmas Bush	0.10	0.25	2.00
145	Ceratophyllum demersum	New South Wales Christmas Bush	0.10	0.17	2.00
146	Philoponium undulatum	Sweet Pittosporum	0.09	0.10	2.00
147	Ceratophyllum demersum	New South Wales Christmas Bush	0.18	0.22	2.28
148	Philoponium undulatum	Sweet Pittosporum	0.14	0.25	2.52
149	Philoponium undulatum	Sweet Pittosporum	0.24	0.36	2.88
150	Ceratophyllum demersum	New South Wales Christmas Bush	0.08	0.10	2.00
151	Philoponium undulatum	Sweet Pittosporum	0.12	0.19	2.00
152	Ceratophyllum demersum	New South Wales Christmas Bush	0.14	0.26	2.00
153	Philoponium undulatum	Sweet Pittosporum	0.28	0.24	2.40
154	Philoponium undulatum	Sweet Pittosporum	0.22	0.28	2.64
155	Philoponium undulatum	Sweet Pittosporum	0.18	0.28	2.16
156	Corymbia gemmifera	Red Bloodwood	0.57	0.62	6.84
157	Philoponium undulatum	Sweet Pittosporum	0.20	0.23	2.40
158	Ceratophyllum demersum	New South Wales Christmas Bush	0.17	0.19	2.04
159	Ceratophyllum demersum	New South Wales Christmas Bush	0.11	0.15	2.00
160	Banksia serrata	Old Man Banksia	0.22	0.36	2.64
161	Ceratophyllum demersum	New South Wales Christmas Bush	0.15	0.18	2.00
162	Ceratophyllum demersum	New South Wales Christmas Bush	0.10	0.17	2.00
163	Ceratophyllum demersum	New South Wales Christmas Bush	0.15	0.26	2.00
164	Acacia panamattensis	Paranatta Wattle	0.28	0.40	3.36
165	Corymbia gemmifera	Red Bloodwood	0.38	0.57	4.68
166	Philoponium undulatum	Sweet Pittosporum	0.14	0.17	2.00
167	Ceratophyllum demersum	New South Wales Christmas Bush	0.12	0.16	2.00
168	Philoponium undulatum	Sweet Pittosporum	0.13	0.15	2.00
169	Ceratophyllum demersum	New South Wales Christmas Bush	0.10	0.14	2.00
170	Ceratophyllum demersum	New South Wales Christmas Bush	0.22	0.28	2.64
171	Ceratophyllum demersum	New South Wales Christmas Bush	0.15	0.22	2.28
172	Philoponium undulatum	Sweet Pittosporum	0.15	0.22	2.28
173	Philoponium undulatum	Sweet Pittosporum	0.24	0.26	2.72
174	Philoponium undulatum	Sweet Pittosporum	0.22	0.31	2.64
175	Philoponium undulatum	Sweet Pittosporum	0.14	0.18	2.00
176	Ceratophyllum demersum	New South Wales Christmas Bush	0.10	0.23	2.04
177	Ceratophyllum demersum	New South Wales Christmas Bush	0.17	0.23	2.04
178	Ceratophyllum demersum	New South Wales Christmas Bush	0.14	0.26	2.00
179	Ceratophyllum demersum	New South Wales Christmas Bush	0.16	0.22	2.00
180	Philoponium undulatum	Sweet Pittosporum	0.21	0.26	2.52
181	Philoponium undulatum	Sweet Pittosporum	0.18	0.23	2.16
182	Allocasuarina fibrosa	Black She-Oak	0.22	0.38	2.64
183	Ceratophyllum demersum	New South Wales Christmas Bush	0.12	0.17	2.00
184	Allocasuarina fibrosa	Black She-Oak	0.10	0.15	2.00
185	Philoponium undulatum	Sweet Pittosporum	0.14	0.22	2.00
186	Angophora costata	Smooth-barked Apple	0.30	0.36	3.60
187	Wongai	Wongai	1.00	1.00	12.00
188	Ecological seedling	Black Ash	0.80	0.72	7.20
189	Ecological seedling	River Red Gum	0.78	1.00	8.76
190	Allocasuarina fibrosa	Black She-Oak	0.12	0.18	2.00
191	Allocasuarina fibrosa	Black She-Oak	0.28	0.33	3.48
192	Allocasuarina fibrosa	Black She-Oak	0.28	0.30	3.00
193	Ecological seedling	Black Ash	0.31	0.36	3.72
194	Allocasuarina fibrosa	Black She-Oak	0.20	0.25	2.40
195	Allocasuarina fibrosa	Black She-Oak	0.10	0.18	2.00
196	Ecological seedling	Black Ash	0.11	0.18	2.00
197	Ecological seedling	Black Ash	0.41	0.48	4.92
198	Philoponium undulatum	Sweet Pittosporum	0.18	0.26	2.52
199	Ecological seedling	Brown Stringybark	0.21	0.30	3.24
200	Acacia panamattensis	Paranatta Wattle	0.28	0.38	3.48
201	Ecological seedling	Brown Stringybark	0.38	0.56	4.08
202	Ecological seedling	Black Ash	0.78	0.86	9.36
203	Allocasuarina fibrosa	Black She-Oak	0.13	0.19	2.00
204	Corymbia gemmifera	Red Bloodwood	0.28	0.36	3.60
205	Ecological seedling	Black Ash	0.32	0.48	3.84
206	Ecological seedling	River Red Gum	0.37	0.48	4.44
207	Corymbia gemmifera	Red Bloodwood	0.22	0.36	2.64
208	Corymbia gemmifera	Red Bloodwood	0.38	0.56	4.08
209	Allocasuarina fibrosa	Black She-Oak	0.18	0.28	2.28
210	Ecological seedling	Black Ash	0.22	0.27	2.64
211	Ecological seedling	Black Ash	0.28	0.29	2.40
212	Corymbia gemmifera	Red Bloodwood	0.21	0.35	2.76
213	Allocasuarina fibrosa	Black She-Oak	0.14	0.26	2.00
214	Ecological seedling	Black Ash	0.88	0.88	8.16
215	Ecological seedling	Narrow-leaved Stringybark	0.20	0.36	2.64
216	Philoponium undulatum	Sweet Pittosporum	0.28	0.48	5.12
217	Ecological seedling	Black Ash	0.48	0.58	5.88
218	Banksia serrata	Old Man Banksia	0.28	0.36	3.60
219	Ecological seedling	Black Ash	0.28	0.12	2.00
220	Ecological seedling	Black Ash	0.38	0.43	4.68
221	Ecological seedling	Black Ash	0.40	0.55	4.80
222	Philoponium undulatum	Sweet Pittosporum	0.31	0.48	5.12
223	Banksia serrata	Old Man Banksia	0.41	0.58	5.16
224	Banksia serrata	Old Man Banksia	0.38	0.48	4.56
225	Ceanothus cuneatus	Campbell Laurel	0.40	0.56	5.88
226	Philoponium undulatum	Sweet Pittosporum	0.28	0.36	3.60
227	Philoponium undulatum	Sweet Pittosporum	0.22	0.28	2.64
228	Banksia serrata	Old Man Banksia	0.38	0.35	3.12
229	Banksia serrata	Old Man Banksia	0.38	0.48	4.56
230	Corymbia gemmifera	Red Bloodwood	0.48	0.48	4.80
231	Philoponium undulatum	Sweet Pittosporum	0.24	0.32	2.88
232	Ecological seedling	Black Ash	0.30	0.42	3.60
233	Ecological seedling	Black Ash	0.20	0.24	2.40
234	Philoponium undulatum	Sweet Pittosporum	0.28	0.28	3.00
235	Banksia serrata	Old Man Banksia	0.30	0.34	3.60
236	Ecological seedling	Allocasuarina fibrosa	0.28	0.48	6.80
237	Corymbia gemmifera	Red Bloodwood	0.28	0.31	3.00
238	Ecological seedling	Scribbly Gum	0.28	0.35	3.48
239	Corymbia gemmifera	Red Bloodwood	0.12	0.16	2.00
240	Ecological seedling	Narrow-leaved Stringybark	0.18	0.24	2.16
241	Acacia panamattensis	Paranatta Wattle	0.40	0.60	5.40
242	Ecological seedling	Black Ash	0.42	0.60	5.04
243	Allocasuarina fibrosa	Black She-Oak	0.28	0.38	3.36
244	Ecological seedling	Black Ash	0.48	0.62	5.76
245	Allocasuarina fibrosa	Black She-Oak	0.28	0.27	2.40
246	Allocasuarina fibrosa	Black She-Oak	0.31	0.38	3.96
247	Ecological seedling	Black Ash	0.47	0.57	5.64
248	Allocasuarina fibrosa	Black She-Oak	0.32	0.44	3.84
249	Allocasuarina fibrosa	Black She-Oak	0.28	0.35	3.12
250	Ecological seedling	Black Ash	0.38	0.47	4.68
251	Allocasuarina fibrosa	Black She-Oak	0.20	0.28	2.40
252	Allocasuarina fibrosa	Black She-Oak	0.28	0.35	3.00
253	Allocasuarina fibrosa	Black She-Oak	0.28	0.27	2.40
254	Allocasuarina fibrosa	Black She-Oak	0.30	0.46	4.56
255	Acacia panamattensis	Paranatta Wattle	0.20	0.27	2.40
256	Allocasuarina fibrosa	Black She-Oak	0.20	0.28	2.40
257	Allocasuarina fibrosa	Black She-Oak	0.31	0.37	3.60
258	Ceanothus cuneatus	Campbell Laurel	0.28	0.46	3.48
259	Philoponium undulatum	Sweet Pittosporum	0.18	0.26	2.00

High Retention value

Moderate Retention value

Low Retention value

Very Low Retention value (should remove)

Extent of canopy as verified by site measure and aerial photos

Existing Tree Proposed for Removal

Tree Identification Number

Normal Tree Protection Zone (TPZ) (Shown for high value trees)

Standing Dead Tree

TREE RETENTION VALUE NOTES
The proposed retention value of the trees was determined based on a considered combination of the size, age, condition and suitability of the tree. Each tree was then ranked according to one of 4 retention categories:
1. **"High" Retention Value** — these are trees that are typically in good or very good condition, large and visually prominent, historically or environmentally important. They should represent a serious physical constraint to development and their removal avoided where possible and feasible.
2. **"Moderate" Retention Value** — these are trees that are in good to reasonable condition, with no major structural defects and could be retained where possible and feasible to do so.
3. **"Low" Retention Value** — these are trees that are of poor condition or have structural defects, are particularly small or common place, are not historically, environmentally or socially significant and should not be considered as a constraint to development. They could be retained only if they are not likely to be impacted by or constrain potentially desirable development outcomes.
4. **"Very Low" Retention Value** — these are trees that are in very poor health, or poor form, or have serious structural defects, are considered weeds or combination of all these, and therefore should be considered for removal regardless of any development.

Consideration has also been given to the relationship of the trees to one another and their proximity to the likely development areas on the site. For example, trees that are part of a closely spaced group, or are likely to be significantly misshapen or unstable with the removal of surrounding trees and structures are considered with these factors in mind.



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REVISION	DESCRIPTION	CHKD	DATE
A	For Development Application	RWS	24/09/18

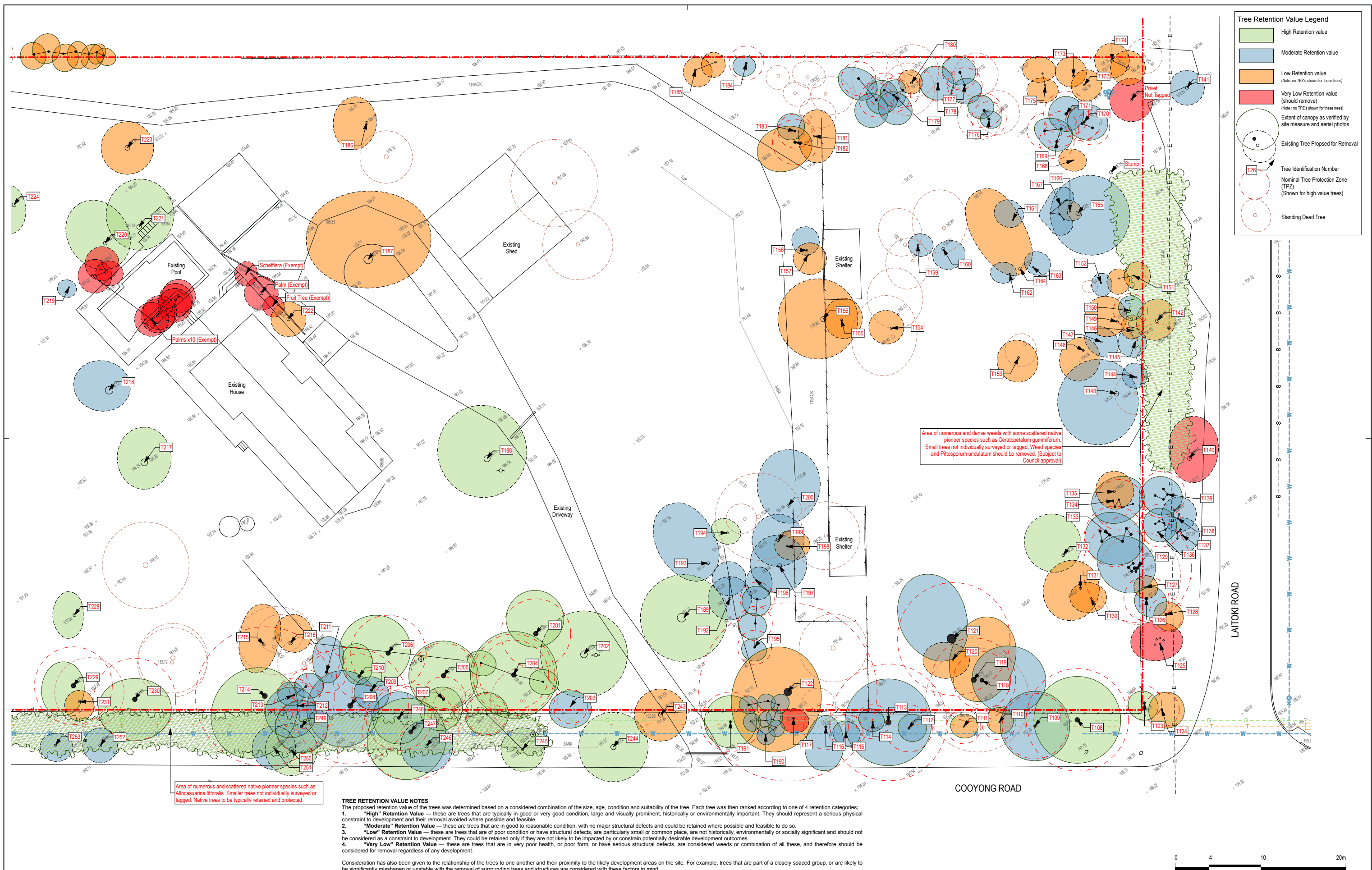
PROJECT & CLIENT
58 Laitoki Road, Terrey Hills - ILUs and RACF

Tolucy Pty Ltd

DRAWING TITLE
Tree Retention Value Plan (West)

PROJECT NO : 18.17
Designed : RWS/ICLB
Drawn : RWS/ICLB
Scale : 1:200@A1/1:400@A3
DRAWING NUMBER
T-01
REVISION
A

Plotted at : 3:49 pm 12/4/19



4.3 Tree Protection & Removal Plans & Specifications

TREE PROTECTION SPECIFICATIONS

1. Tree Protection Measures and Protocols.

All work around existing trees to be retained shall be in accordance with AS 4970-2009 Protection of trees on development sites with the clear establishment of the required Tree Protection Zones (TPZ's). If the scope of work allowed within or the extent of the Tree Protection Zones of existing trees is not clear, please refer to the Contract Manager or Project Consulting Arborist for clarification.

Before any site works commence tree protection zones and other measures must be established and conveyed to those all working on the site. The Contractor shall ensure all subcontractors are inducted prior to working on the site. All inductions shall include description and identification of the Tree Protection Zones and the restriction on work and activities with regard to trees.

Damage to roots or degradation of the soil through compaction and/or excavation within TPZ's is likely to cause serious damage to the tree. Any work operations required within TPZ's must be carried out with extreme care. All trees, palms and other shrubs within TPZ's are to be retained unless shown otherwise on the Tree Protection Plan(s). Trees marked for retention shall not be used to display signage, or as fence or cable supports for any reason. No materials stockpiling, chemicals or washout areas are permitted immediately upslope of or within the Tree Protection Zone. The washing down of wheel barrows, paint cans/brushes, acids and the like shall not to be done near existing trees as the runoff is very harmful to tree roots.

No fuel powered pumps or generators or air compressors are to be placed within TPZ's. No fuel or chemicals shall be stored and no equipment or vehicles shall be serviced or re-fuelled within a TPZ.

2. Controlled Construction Access

Construction access points, stockpiling and storage areas shall be clearly identified on site and fenced off where appropriate. Uncontrolled access and parking of vehicles inside TPZ's shall be avoided. If access is required through a tree protection zone, the access way shall be treated with ground protection.

3. Tree Protection Fencing & Signage

The Tree Protection Plan(s) shows the extent of areas to be fenced and protected. Protection measures shall be certified as adequate by the Project Consulting Arborist. This fencing may form part of the general construction site fencing, where practical. It shall remain in place as long as possible and typically not be removed until the final landscape installation in those areas begins.

All tree protection fencing shall be 1800mm high galvanised chain wire or welded steel mesh. Fencing must be bolted together and secured with the necessary back stays and bracing.

Star pickets with bunting or danger tape shall not constitute acceptable tree protection fencing.

Suitable signage as defined by AS 4970-2009 Appendix C shall be affixed to the external side of the fencing at a spacing of not less than 1 sign per 20 lineal metres of fence.

If fence locations conflict with the proposed works, contact the Project Consulting Arborist and Contract Manager for resolution. No new services (unless under-bored) shall be located within or through the Tree Protection Zone.

4. Trunk and Lower Branch Protection

A trunk barrier is to be erected around the circumference of the tree trunk and root buttress where shown. This barrier will consist of a double layer of used carpet or carpet underfelt placed around the trunk. A layer of battens is to be placed over the underfelt. The battens are to have a maximum spacing of 50mm. The height of the battens is to be 2 metres or to the height of the first branches. Lower large branches may require the same protection if likely to be damaged by passing vehicles or equipment. Secure in place with galvanised steel bracing straps. Do not nail into or otherwise injury the trunk or bark. Battens may be made from any suitable waste timber of similar sizes and depths. All sharp or protruding edges are to be properly covered with tape or similar padding.



Example image of acceptable ground protection rumble boards

5. Works within the TPZ

All work within the root zone of existing trees shall be undertaken with the utmost care. If by necessity a tree requires removal of branches for building or access, pruning shall be done in strict accordance with accepted arboriculture techniques and AS 4373-2007. No rubbish, spoil or new materials shall be placed on the root zone of any existing tree or against their trunks.

6. Ground Protection

If it is proposed to create any access route, or similar, within the TPZ of a retained tree, the Contractor shall install rumble boards over the TPZ ground surface. No excavation shall be allowed. Contractor shall first place a suitable permeable geotextile to the extent required and then a 100mm thick layer of wood chip mulch or coarse no-fines gravel over the extent to be covered. Then place hardwood boards (minimum 3600 x 200 x 75mm) on their flat edge, side by side, with a 30 - 50mm gap to form a rumble strip. These boards are to be held together with three galvanised metal bracing straps nailed to each board. The two outer straps are to be approximately 200mm in from the ends of the boards. The third strap is to be along the centre line of the boards.

7. Provision of Temporary Irrigation

A temporary and automated (battery powered timer is sufficient) watering system to be placed within the TPZ's of all trees to maintain adequate water to the retained trees and help maintain their healthy condition. This shall be a surface mounted 'residential-style' soaker hose and/or similar surface sprinkler systems. It is to be surface visible and spray delivered so that is operation can be easily visible and verified. It should be on a designated supply line, separate from other construction related water supplies to minimise its likelihood of being disconnected.

Typically, during spring and summer months it should be set to run for a minimum of 30 minutes every day, in the early morning. During, autumn and winter months it should be set to run for 1 hour once every week. The operation can be suspended temporarily in periods of extensive and prolonged rain.

The system is to remain in place for the duration of construction, or until the project consulting arborist approves it's removal. It may be removed to allow final landscape treatments to proceed. If accidentally disturbed or damaged by construction activities, it is to be reinstated as soon as practicable.

8. Structural Demolition Within TPZ's

Project Consulting Arborist shall be on site during all demolition work within the TPZ's to monitor and advise on tree protection. Secateurs and a handsaw shall be available to deal with and cleanly cut any exposed roots that have to be cut. Machines with a long reach may be used if they can work from outside TPZ's or from protected areas within TPZ's. They shall not encroach onto unprotected soil in TPZ's.

Debris to be removed from TPZ's must be moved across existing hard surfacing or temporary ground protection in a way that prevents compaction and disturbance of soil. Alternatively, it can be lifted out by machines provided this does not disturb TPZ's or damage the canopy. If appropriate, leave below ground structures such as footings and disused pipes in place if their removal will cause excessive root disturbance.

When pulling up existing paving the Contractor shall work backwards, lifting demolished paving back onto the existing paving. Roots may be found growing under the pavement and should not be trafficked. Roots growing into existing sub-base should be left and new surface finishes placed over the top without disturbance.

9. Excavations or Trenching within TPZ's

Excavation within TPZ's shall not be allowed using mechanical equipment such as excavators or backhoes. Excavation within TPZ's shall only be carried out carefully by hand taking care not to damage the bark and wood of any roots. Specialist tools for removing soil around roots using compressed air (air spade), or water vacuum extraction shall be an appropriate alternative to hand digging and is the preferred method.



Example image of acceptable tree protection batten

Exposed roots to be removed shall be cut cleanly with a sharp saw or secateurs at the face of the excavation. Roots temporarily exposed must be protected by appropriate covering with damp hessian or sand. Roots greater than 50mm in diameter are to be retained and shall only be cut in exceptional circumstances and only after consultation with the Project Consulting Arborist. Roots greater than 100mm in diameter shall typically not be allowed to be cut and must be worked around.

10. Soft Landscaping Installation

Final trimming and planting shall be judiciously undertaken around trees. All soft landscaping within the tree protection zones will be installed with care to avoid root disturbance from irrigation trenching, lighting installation and the planting of larger plants. Permanent irrigation (if used) shall be installed as spray heads located outside of TPZ's and spraying inwards. All other services such as small-scale electrical services shall also be designed and installed to avoid any excavation or trenching around the trees.

No significant excavation or cultivation, especially by rotary hoes or excavators, shall occur within TPZ's. Where new designs require the levels to be increased, good quality and permeable top soil shall be used. It should be firmed into place but not over compacted. All areas close to tree trunks shall be kept at the original ground level. Where turf is to be installed tree trunks shall have mulched rings applied rather than grass laid up to the trunk.

The size of the installed plants shall typically be less than 5L pots so that the maximum depth of the new root balls is less than 200mm. Any planting proposed that is larger than this shall be only installed outside of the SRZ and with care to not injure roots while digging planting holes.

11. Canopy Pruning

The Contractor shall prune branches of protected trees only as directed by the Project Consulting Arborist. Pruning is only to be undertaken by a qualified arborist (under the supervision of a person with AQF Level 4 or above). The Project Consulting Arborist is to be at present at all times during the pruning work. Work is to be in strict accordance with to AS4373 Pruning of Amenity Trees. Do not treat wounds.

12. Root Pruning

Pruning of roots of protected trees shall only be as directed the Project Consulting Arborist. The Tree Contractor shall use only a qualified arborist (AQF Level 4 or above). The Project Consulting Arborist is to be present at all times during the root pruning.

Roots are not to be cut using normal excavation machinery of any sort. This usually results in splitting and massive disturbance well past the intended line of cut. When required to cut roots, use hand methods and sharp hand tools (e.g. secateurs, hand saw) such that the remaining root systems are preserved intact and undamaged. Roots are to be cut back by hand square to the direction of the root travel (or edge of the excavation). Do not cut any tree roots exceeding 40mm diameter unless permitted. Excavations within root zones should be kept open for as short a period as possible. Any excavated face containing roots is to be temporarily supported, where necessary, to prevent soil loss from around the other retained roots.

13. Accidental Tree Damage

Should a tree be accidentally damaged, the Contractor shall immediately notify the Project Consulting Arborist. Timing can be of the essence, particularly with bark injuries, trunk damage or chemical contaminations.

If a branch has been broken, it shall be removed and the damaged end pruned to a suitable branch collar. If the branch has been torn out of the trunk, assessment shall be made and the damage cleaned up by as much as possible without further damage to the tree.

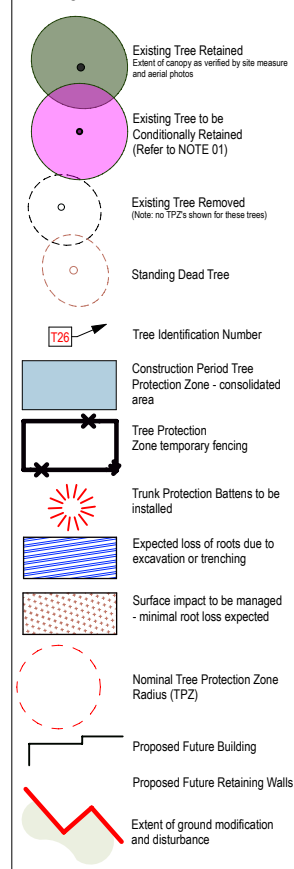
If roots are accidentally disturbed or excavated, any broken, crushed and torn sections shall be exposed and pruned leaving clean cuts to minimise risk of infection by fungal pathogens and promote good conditions for new root growth.



Example image of acceptable tree protection fencing measures to be applied. (1.8m high rigid metal fencing with appropriate lateral bracing)

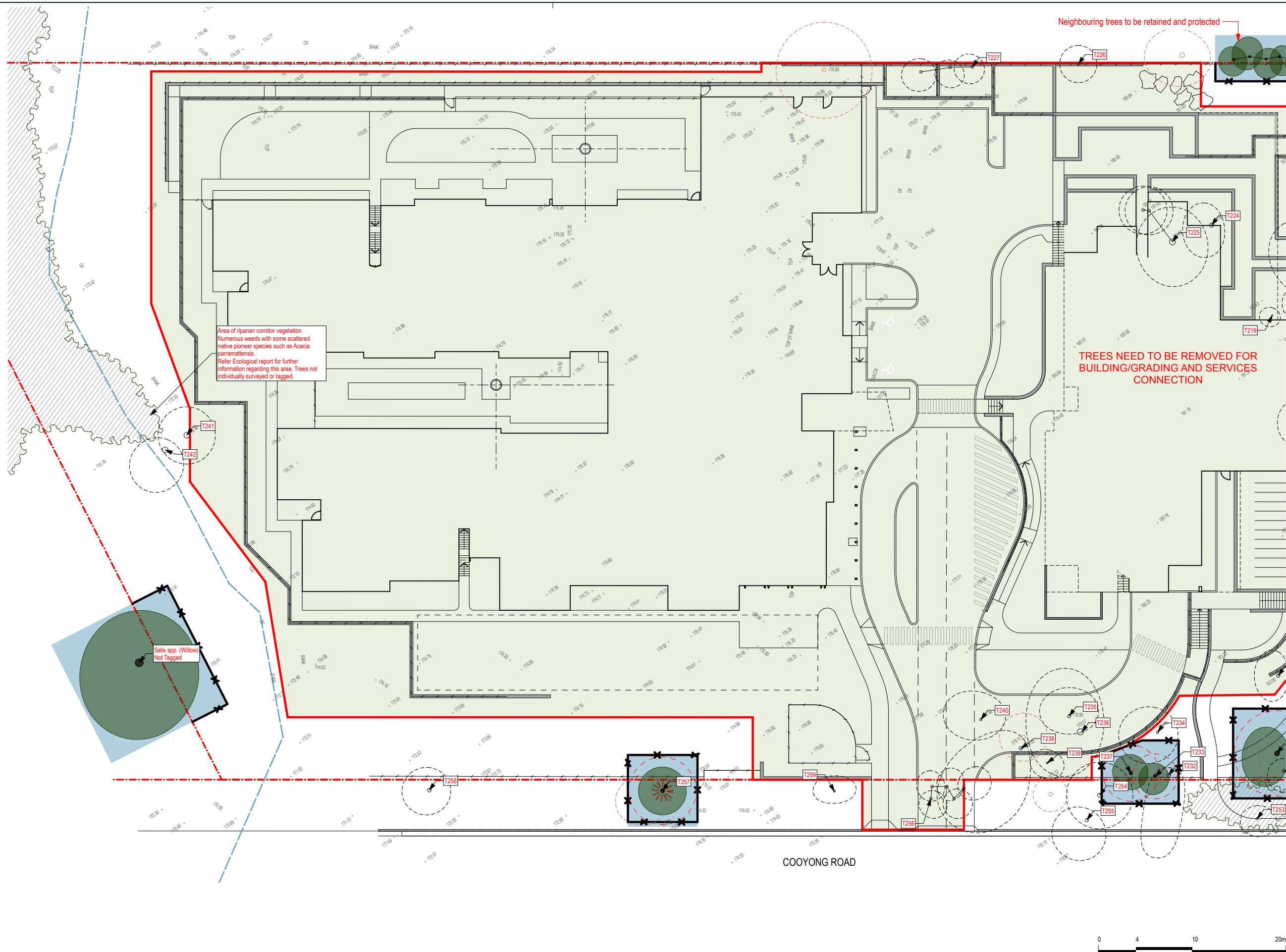
58 Laitoki Road, Terrey Hills - Tree Impact Assessment Schedule										
ID No	Tree Species	Common Name	Trunk Diameter at Base (mm)	Trunk Height (m)	Normal TPZ (m)	SRZ (m)	Recommendation			
					(m) (AS 4368)	(m) (AS 4368)	Ratio/Value			
108	Eucalyptus nitida	Black Ash	0.30	0.60	6.00	2.73	High	Retain and Protect		
109	Acacia paniculata	Paranatta Wattle	0.32	0.38	3.84	2.20	Moderate	Retain and Protect		
110	Allocasuarina littoralis	Black She-Oak	0.30	0.20	2.00	1.40	Low	Retain and Protect		
111	Allocasuarina littoralis	Black She-Oak	0.14	0.24	2.00	1.82	Low	Retain and Protect		
112	Allocasuarina littoralis	Black She-Oak	0.30	0.31	2.76	2.02	Moderate	Retain and Protect		
113	Eucalyptus nitida	Black Ash	0.30	0.10	6.00	2.73	Moderate	Retain and Protect		
114	Allocasuarina littoralis	Black She-Oak	0.16	0.23	2.00	1.79	Moderate	Retain and Protect		
115	Allocasuarina littoralis	Black She-Oak	0.10	0.10	2.00	1.49	Moderate	Retain and Protect		
116	Eucalyptus nitida	Black Ash	0.30	0.12	2.64	1.91	Moderate	Retain and Protect		
117	Allocasuarina littoralis	Black She-Oak	0.14	0.24	2.00	1.82	V Low / Remove	Remove		
118	Eucalyptus nitida	Black Ash	0.28	0.42	3.36	2.30	Moderate	Retain and Protect		
119	Acacia paniculata	Paranatta Wattle	0.10	0.20	1.00	1.00	Low	Retain and Protect		
120	Allocasuarina littoralis	Black She-Oak	0.30	0.30	4.50	3.30	Moderate	Retain and Protect		
121	Eucalyptus nitida	Black Ash	0.30	0.38	3.84	2.20	Low	Retain and Protect		
122	Xylocarpus pyramis	Woody Fan	0.16	0.26	2.00	1.68	High	Retain and Protect		
123	Allocasuarina littoralis	Willow-leaved Wattle	0.17	0.20	2.04	1.68	Low	Retain and Protect		
124	Allocasuarina littoralis	Cotoneaster	0.30	0.30	2.40	2.00	V Low / Remove	Remove		
125	Corymbia gypsophylla	Red Bloodwood	0.32	0.28	3.28	2.64	High	Retain and Protect		
126	Corymbia gypsophylla	Red Bloodwood	0.32	0.28	3.28	2.64	High	Retain and Protect		
127	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.68	Low	Retain and Protect		
128	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.79	Low	Retain and Protect		
129	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.68	Moderate	Retain and Protect		
130	Allocasuarina littoralis	Black She-Oak	0.14	0.24	2.00	1.82	Low	Retain and Protect		
131	Allocasuarina littoralis	Paranatta Wattle	0.24	0.28	2.88	1.94	Low	Remove		
132	Eucalyptus nitida	Black Ash	0.30	0.10	3.12	2.08	High	Retain and Protect		
133	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.75	Moderate	Retain and Protect		
134	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Retain and Protect		
135	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.31	3.60	2.02	Low	Remove		
136	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.10	2.00	2.13	Moderate	Retain and Protect		
137	Allocasuarina littoralis	New South Wales Christmas Bush	0.30	0.30	3.72	2.11	Moderate	Retain and Protect		
138	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.68	Moderate	Remove		
139	Eucalyptus nitida	Black Ash	0.30	0.16	3.60	2.37	V Low / Remove	Remove		
140	Allocasuarina littoralis	Cockatoo	0.30	0.30	3.96	2.20	Low	Remove		
141	Acacia paniculata	Paranatta Wattle	0.40	0.43	4.32	2.70	Low	Remove		
142	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.68	Moderate	Remove		
143	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.31	Moderate	Remove		
144	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.26	Low	Remove		
145	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.75	Moderate	Remove		
146	Allocasuarina littoralis	Sweet Pittosporum	0.21	0.22	2.52	1.75	Low	Remove		
147	Allocasuarina littoralis	Sweet Pittosporum	0.24	0.28	2.88	2.00	Low	Remove		
148	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	2.26	Moderate	Retain and Protect		
149	Allocasuarina littoralis	Sweet Pittosporum	0.10	0.20	1.00	1.49	Low	Remove		
150	Allocasuarina littoralis	New South Wales Christmas Bush	0.14	0.20	2.00	1.68	Moderate	Remove		
151	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.30	3.72	2.30	Low	Remove		
152	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.30	3.72	2.30	Low	Remove		
153	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.30	3.72	2.30	Low	Remove		
154	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.30	3.72	2.30	Low	Remove		
155	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.30	3.72	2.30	Low	Remove		
156	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.30	3.72	2.30	Low	Remove		
157	Allocasuarina littoralis	Sweet Pittosporum	0.30	0.30	3.72	2.30	Low	Remove		
158	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
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191	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
192	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
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220	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
221	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
222	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
223	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
224	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
225	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
226	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
227	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
228	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
229	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
230	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
231	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
232	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
233	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
234	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
235	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
236	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
237	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
238	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
239	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
240	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
241	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
242	Allocasuarina littoralis	New South Wales Christmas Bush	0.10	0.20	1.00	1.49	Moderate	Remove		
243										

Tree Impact and Protection Plan Legend



NOTE 02

Refer to the accompanying Arboricultural Impact Assessment Report for full description of trees, measurements and methods used to assess the trees, and proposed tree protection measures. Refer to T-03 for tree protection specifications and schedule.



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B	For LEC Determination	RWS	12/04/19
A	For Development Application	RWS	24/09/18
REVISION	DESCRIPTION	CHKD	DATE

PROJECT & CLIENT
58 Laitoki Road, Terrey Hills - ILUs and RACF

Tolucy Pty Ltd

Tree Protection & Removal Plan (West)



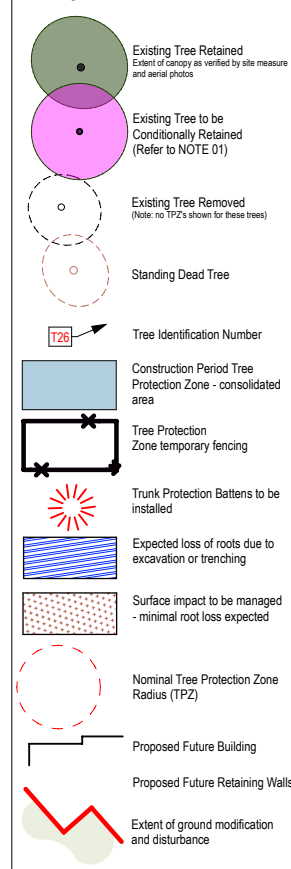
Project No : 18.17
Designed : RWS/ICLB
Drawn : RWS/ICLB
Scale : 1:200@A1/1:400@A3

T-04

B

Plotted at : 3:50 pm 12/4/19

Tree Impact and Protection Plan Legend



NOTE 01 - TREES TO BE CONDITIONALLY RETAINED

Northern Beaches Council has requested road widening and the installation of a new formalised kerb along the western side of Laitoki Road and the northern side of Cooyong Road. Trees that directly conflict with this have been shown to be removed. There is one tree illustrated by the pink colouring that is likely to be impacted by this work. Regrading of verge to be minimised. It is the Arborists recommendation that the verge levels be sensitively maintained to enable retention of the trees in and adjacent the verge. The protection of the conditionally retained tree needs to be made on site during the works. For this reason this tree has been listed as conditionally retained, subject to detailed observation of root disturbance once kerb work is undertaken. Refer also to Section 02 on drawing L-SD-07 by Arterra Design

NOTE 02

Refer to the accompanying Arboricultural Impact Assessment Report for full description of trees, measurements and methods used to assess the trees, and proposed tree protection measures. Refer also to T-03 for tree protection specifications and schedule.

