

# Randwick City Council



## Tree Management Technical Manual

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## TABLE OF CONTENTS

<b>SCOPE AND PURPOSE</b>	<b>4</b>
<b>INTRODUCTION – USE OF THE MANUAL</b>	<b>5</b>
Randwick City Council’s Protected Trees .....	5
Private Trees .....	5
Public Trees .....	5
Significant Trees .....	5
Required Practices .....	5
Recommended Practices .....	6
Definitions .....	6
Appendices .....	6
Assumptions and Limiting Conditions .....	6
<b>SECTION 1: DEFINITIONS</b>	<b>7</b>
<b>SECTION 2: REMOVAL/PRUNING, REPLACEMENT &amp; PLANTING OF TREES</b>	<b>10</b>
Tree Removal/Pruning Considerations .....	10
Exemptions .....	12
Tree Removal .....	14
Provision of Evidence for Dangerous/Hazardous Trees .....	14
Tree Pruning .....	15
Pruning Techniques .....	15
Directional Pruning .....	15
Tip Pruning .....	16
Crown Lifting .....	16
Crown Thinning .....	17
Formative Pruning of Trees .....	17
Tree Replacement .....	18
Tree Planting and Maintenance .....	18
Planting Procedure .....	19
Maintenance Procedure .....	19
Recommended Tree Species .....	21
Tree/Arborist Reports .....	21
Trees on Development Sites .....	22
Site Plan .....	23
Verification of Tree Protection .....	23
Pre-construction Meeting .....	23
Protective Fencing for Designated Trees and Street Trees .....	24
Size and Type of Fence .....	24
Trunk Protection Measures .....	25
Tree Protection Zone .....	25
Mulching .....	26
Soil Compaction .....	26
Irrigation .....	26
Erosion Control .....	26
Street Trees and Development .....	27
Street Tree Removal .....	27
Street Tree Roots and Public/Private Infrastructure .....	28
<b>REFERENCES</b>	<b>30</b>
<b>APPENDICES</b>	<b>31</b>
Appendix A .....	31
Appendix B .....	36
Appendix C .....	37
Appendix D .....	40
Appendix E .....	41
Appendix F .....	42
Appendix G .....	44
Appendix H .....	46

## SCOPE AND PURPOSE

Randwick City Council has a very important resource in its trees and, as with the management of any resource, there are significant problems associated with the maintenance and retention of trees growing within the urban environment.

Trees are potentially the largest and most significant elements in the urban landscape. As such, they provide the greatest opportunity to define and develop a particular identity and character for the City, as well as being a source of shade and shelter, a provider of habitat and food source for native birds and other wildlife and providing a number of other environmental and commercial benefits – including enhanced property values.

Trees are also significant contributors to people's daily experiences and their absence or removal and the resultant loss of visual amenity has serious implications for the community's sense of well being.

Council is therefore committed to the protection and enhancement of this very valuable natural resource, while at the same time recognising that urban development presents a range of challenges and opportunities requiring careful planning and increasingly professional arboricultural management.

As a result of ongoing urban consolidation and development, large numbers of established and significant trees on both public and private property are becoming increasingly vulnerable. In order to protect these valuable community assets, Randwick City Council has adopted a suite of management documents including a Tree Preservation Order (TPO), Street Tree Masterplan, Street Tree Identification Manual and a Register of Significant Trees.

These documents are the primary regulatory tools used to provide protection to nominated trees throughout the City and for ensuring that these assets continue to remain significant contributors to the landscape, while at the same time recognising that they help define the unique character of the Randwick City area.

To help co-ordinate and facilitate the proper management of trees on both public and private property and to ensure that appropriate tree care standards are complied with in the maintenance and management of tree assets, Council has drafted this Tree Management Technical Manual.

This manual is intended to be used as both a regulatory and reference document by Council officers, Council operational staff, contractors, property owners, strata managers and developers in relation to all tree management and maintenance procedures.

It defines the technical standards and Specifications necessary for the proper management of trees – particularly in relation to urban development and construction works – while at the same time providing recommendations for a range of works associated with tree management in the urban environment.

The manual does not contain Specifications or procedures for tree planting operations undertaken in central business districts or commercial centres. These are predominantly capital works projects that involve the planting of large trees (100-200 litres), coupled with the installation of site specific tree grates and/or tree guards. They often involve a more rigorous and detailed maintenance regime than that usually associated with the planting and maintenance of 25-litre tree stock.

## INTRODUCTION – USE OF THE MANUAL

### RANDWICK CITY COUNCIL’S PROTECTED TREES

This manual details the procedures and standards required for the proper management and preservation of trees within the City of Randwick.

Under the provisions of Randwick City Council’s Tree Preservation Order 2005 (refer to Appendix A) a person must not, on land to which the Order applies, ringbark, cut down, top, lop, prune, remove, poison, tree root prune, destroy or injure any tree/s covered by the Order without the consent of the Council.

Trees which fall into the following three categories are defined as ‘Protected Trees’ within the City of Randwick and must be maintained in accordance with the standards and requirements contained within this manual. A permit or Development Consent (whichever is applicable) must be obtained from Council prior to the pruning or removal of any ‘Protected Tree’.

#### ○ **Private Trees**

Any palm tree, cycad or tree fern of any size; any tree with a height of six (6) metres or more; any tree with a canopy width of four (4) metres or more; any tree with a circumference greater than one (1) metre measured one (1) metre above the ground – excluding trees listed in Schedule 1 of Council’s Tree Preservation Order 2005.

#### ○ **Public Trees**

Any tree on public land, regardless of size (public land means any land which the public use or are entitled to use for a public purpose including but not limited to a public reserve, a public place, a public road, crown land, community land, public open space, a public walkway and a common); any tree in Bushland (bushland has the same meaning as that defined in *State Environmental Planning Policy No 19 – Bushland in Urban Areas*).

#### ○ **Significant Trees**

All trees listed within Randwick City Council’s Register of Significant Trees and in Schedule 3 – Heritage Items (Clause 49) in Randwick Local Environmental Plan (RLEP) 1998.

NOTE: Any tree with a height of less than six (6) metres, a canopy width of less than four (4) metres or a circumference less than one (1) metre measured one (1) metre above the ground may be pruned and/or removed without the consent of Council. This excludes palm trees, cycads or tree ferns of any size, which are covered by Council’s Tree Preservation Order 2005.

### REQUIRED PRACTICES

- All **REQUIRED** practices are to be undertaken by the property owner, managing agent, strata manager, project supervisor or contractor wherever stipulated by Council - these are the minimum requirements by which the care and maintenance of a ‘Protected Tree’ are to be administered;
- The **REQUIRED** practices identified throughout this manual are considered reasonable measures that are consistent with best management practices in the tree care industry intended to promote healthy, structurally sound trees.
- In all circumstances the Director – City Services or Director – City Planning or their delegated representatives shall, if justified by specific on-site conditions such as conflict with utilities or services, have the discretion to modify or alter any condition, practice or standard stipulated within this manual.

## RECOMMENDED PRACTICES

- **RECOMMENDED** practices identified throughout this manual are NOT mandatory but provide additional pro-active measures for the care of trees and include procedures such as fertilising, tree hazard reduction, planting trees, pruning techniques, etc.
- A **RECOMMENDED** practice may be required if it is so specified within the conditions of approval for a Development Consent or TPO permit, or for the mitigation of injury or hazard.
- In all circumstances the Director – City Services or Director – City Planning or their delegated representatives shall, if justified by specific on-site conditions such as conflict with utilities or services, have the discretion to modify or alter any condition, practice or standard stipulated within this manual.

## DEFINITIONS

Words and terms that are particular to the arboricultural and construction industries are specifically defined in this manual to provide a uniform understanding of the terms and concepts used in the manual. Words that are defined within this document are noted in *italics* and are detailed in Section 1 – Definitions.

## APPENDICES

The appendices at the end of this manual provide supplementary information relating to practices referenced within the manual as well as sources of technical information for specific or problematic situations.

## ASSUMPTIONS AND LIMITING CONDITIONS

- No responsibility is assumed by Randwick City Council for matters legal in nature related to this manual. Any legal or technical description given is assumed to be correct.
- All care has been taken to obtain reasonable and relevant information from qualified and reliable sources in the preparation of this document.
- Visual material within this manual such as sketches, diagrams, photographs, etc, are not necessarily to scale and should not be construed as engineered data for construction.
- This document has been prepared utilising accepted contemporary standards of tree care and maintenance, evaluation and assessment procedures, diagnostic and reporting techniques and sound arboricultural practices as recommended by the sources listed in the 'References' section.

## SECTION 1 - DEFINITIONS

For the purposes of this manual and the interpretation of standards and procedures, the following definitions shall apply:

**arborist** means a person who holds the Australian Qualification Framework (AQF) Certificate IV in Horticulture (Arboriculture) or a person employed by Council as a qualified person for the purposes of arboricultural management.

**Australian Standard** means Australian Standard AS 4373 – 2007 – *Pruning of Amenity Trees*.

**buffer zone** relates to vegetation planted for the express purpose of providing protection for identified core habitats and remnant bushland strips.

**bushland** means land on which there is vegetation which is either a remainder of the natural vegetation of the land or, if altered, is still representative of the structure and/or floristics of the natural vegetation as defined in *State Environmental Planning Policy No 19 – Bushland in Urban Areas*.

**clearing native vegetation** means any one or more of the following:

- a) cutting down, felling, thinning, logging or removing native vegetation;
- b) killing, destroying, poisoning, ringbarking, uprooting or burning native vegetation;
- c) severing, topping or lopping branches, limbs, stems, roots or trunks of native vegetation;
- d) substantially damaging or injuring native vegetation in any other way.

**culturally significant tree/s** means trees which are significant features of the cultural landscape and which are listed in Council's Register of Significant Trees.

**dangerous** means a tree that has structural defects (i.e., fallen branches, split trunk, advanced decay) that could result in the tree collapsing or falling without warning.

**dead** tree means a tree with no living vascular tissue.

**diameter at breast height (DBH)** means the diameter of the trunk of a tree measured at breast height (1.4m or 54 inches above ground level).

**exotic** means a tree/s that is not locally indigenous.

**hazardous** – refer to 'dangerous' above.

**height** means the distance measured vertically between the horizontal plane of the lowest point of the base of the tree/s which is immediately above ground level and the horizontal plane of the uppermost point of the tree/s.

**indigenous** means a tree/s or other vegetation being of a species that existed in, or on land in the vicinity of, the Randwick Local Government Area (LGA) before European settlement.

**injury** or **injuring** means damage to a tree and includes:

- a) lopping and topping;

- b) poisoning, including applying herbicides and other plant toxic chemicals to a tree or spilling (including washing off or directing water contaminated by) oil, petroleum, paint, cement, mortar and the like onto the root zone;
- c) cutting and tearing of branches and roots that is not carried out in accordance with accepted arboricultural practices, does not qualify as 'pruning' (as defined within AS 4373 – 2007 – *Pruning of Amenity Trees*) or which is done for invalid reasons;
- d) ringbarking, scarring the bark when operating machinery, fixing objects (eg, signs) by nails, staples or wire, using tree climbing spikes in healthy trees marked for retention (except for access to an injured tree worker) or fastening materials that circle and significantly restrict the normal vascular function of the trunk or branches;
- e) damaging a tree's root zone by compaction, excavation or asphyxiation (including unauthorised filling or stockpiling of materials);
- f) underscrubbing, particularly carried out by mechanical tools such as brushcutters and the like.

**lopping** means the cutting of branches or stems between branch unions or at internodes on trees.

**native vegetation** has the same meaning as in the *Native Vegetation Act 2003 (NV Act)*, and means any of the following types of indigenous vegetation:

- a) trees;
- b) understorey plants;
- c) groundcovers;
- d) plants occurring in a wetland.

**prune** or **pruning** means cutting branches from a tree/s in a planned and systematic manner that is carried out in accordance with the provisions of Australian Standard AS 4373 - 2007 - *Pruning of Amenity Trees*, and which consists of the following pruning types:

Crown maintenance\* pruning involving:

- a) General pruning
- b) Thinning
- c) Deadwooding
- d) Selective pruning
- e) Formative pruning

\*Crown maintenance pruning relates to pruning according to the growth habit of the tree/s without reducing the area of the crown, while retaining the structure and size of the tree/s.

Crown modification\* pruning involving:

- f) Reduction pruning
- g) Crown lifting
- h) Pollarding
- i) Remedial pruning
- j) Powerline clearance

\*Crown modification pruning relates to pruning that changes the structural appearance and habit of the tree/s.

**public land** has the same meaning as in the *Local Government Act 1993*.



**qualified arborist** means an Australian Qualification Framework level 5 (Diploma) arborist (AQF5). This is the minimum qualification accepted by Council for the purposes of the preparation of an arborist's report involving culturally significant tree/s.

**remnant tree** or **remnant vegetation** means a native tree or any patch of native vegetation which remains in the landscape on the original soil profile, after removal of most or all of the native vegetation in the immediate vicinity.

**remove** or **removal** means to cut down, fell, destroy, kill, take away, uproot or transplant a tree from its place of origin.

**significant tree** means a tree or trees which are significant features in the City's heritage or cultural landscape and which are listed in Council's Register of Significant Trees. They may be historic, unique, rare, large or have community support for their retention.

**topping** means cutting away part or all of the tree canopy, leaving a trunk and stubbed main branches.

**trade arborist** means a tradesperson who holds the Australian Qualification Framework (AQF) Certificate III in Horticulture (Arboriculture) or other national or international qualification considered equivalent by Council.

**tree** or **trees** means a perennial plant with at least one self-supporting woody or fibrous stem, being of any species whether indigenous, exotic or introduced which:

- a) is six (6) metres or more in height; and/or
- b) is four (4) metres or more in canopy width, and/or
- c) has a trunk diameter of one (1) metre or more measured at one (1) metre above ground level (or its equivalent in the case of multi-trunked trees); or
- d) is a palm tree (except *Syagrus romanzoffianum* - Cocos palm), cycad or tree fern of any species growing within the City of Randwick, irrespective of its size, or
- e) is any tree on public land of any size, or
- f) is any tree in bushland of any size.

**tree worker** means a tradesperson who holds the Australian Qualification Framework (AQF) Certificate II in Horticulture (Arboriculture) or other national or international qualification considered equivalent by Council.

**trunk** means the main stem of the tree, as distinguished from the branches and roots.

**undesirable species** means plants that are listed in Schedule 1 of Council's Tree Preservation Order 2005 which are deemed undesirable due to their location or as having characteristics which may lead to poisoning, weed infestation, brittle and dangerous wood, excessive spread of roots or bushland invasion.

**width** means the distance measured horizontally (in metres) between the two (2) widest points of a tree's canopy.

**wildlife corridors** are vegetative corridors that link habitat which is suitable for animals (fauna) to travel along in relative safety.

## SECTION 2 – REMOVAL/PRUNING, REPLACEMENT AND PLANTING OF TREES

Council's Tree Preservation Order 2005 is designed to protect and preserve mature and significant trees growing within the City of Randwick. Council originally introduced a Tree Preservation Order in response to community concern that many *trees* within the City were being lost through property development and indiscriminate tree felling.

In order to provide additional protection to *trees* which have significant heritage value, Council has adopted a Register of Significant Trees. This Register contains a variety of *culturally significant trees* that have been recognised as having exemplary heritage/botanic/cultural/commemorative/aesthetic values.

Council approval or development consent is required for the *pruning/removal* of all *trees* covered by its Tree Preservation Order 2005, with development consent specifically required for the *pruning and/or removal* of all *trees* listed in its Register of Significant Trees or which are located within Heritage Conservation Areas.

### TREE REMOVAL/PRUNING CONSIDERATIONS

In general, the following works are prohibited under the provisions of Council's Tree Preservation Order 2005:

- a) *tree injury* as defined in this manual;
- b) unauthorised *tree removal* and/or *pruning*, including the *removal/pruning* of *trees* without specific Council consent or without Council's approval for the erection of a building or carrying out of a development activity; and
- c) *clearing native vegetation* on any land without first obtaining a consent from Council.

Residents or property owners wishing to *prune* and/or *remove trees* covered by Council's Tree Preservation Order 2005 are **REQUIRED** to make written application for consent to undertake any such works. An 'Application for Permit to Prune/Remove Tree/s' form (refer to Appendix B), which can be downloaded from Council's website, must be completed - providing the details of all works proposed to be undertaken.

A 'DA for Tree Works' application (refer to Appendix C) is specifically **REQUIRED** when applying to *prune/remove* any *tree* growing within a Heritage Conservation Area or which is listed on Council's Register of Significant Trees, and this form can also be downloaded from Council's website.

The same procedure applies where a property owner wishes to judiciously *prune* a *tree* or *trees* on a neighbouring property which is covered by Council's Tree Preservation Order.

Council can only approve an application to *remove* or significantly *prune* a *tree/s* covered by its Tree Preservation Order when that application is made by the owner of the *tree/s* or where consent for the lodging of any such application has been granted in writing by the owner of the *tree/s*.

Any relevant application form to *prune/remove tree/s* must be completed as prescribed and the appropriate application fee paid at the time of lodgement. A written determination will generally be mailed to the applicant within 10 days of lodgement.

Any approved *tree pruning/removal* works are only to be undertaken by professionally qualified *tree workers* or *arborists* and must comply with AS 4373 – 2007 *Pruning of Amenity Trees*.

In assessing whether or not to approve the *removal* or *pruning* of a *tree* or *trees*, Council will take into consideration (but not be limited to) the following:

- a) whether the *tree* has significant amenity or aesthetic value or is ecologically significant in the local or regional context, with particular emphasis placed on retaining *trees* listed on Council's Register of Significant Trees;
- b) the condition, maturity and Safe Useful Life Expectancy (S.U.L.E.) of the tree/s with respect to the practicality of remedial actions (In the case of *trees* claimed to be *dangerous*, Council will only consider a report on the condition of a *tree* on private property prepared by an *arborist*, as defined in this manual);
- c) a report from a *qualified arborist*, as defined in this manual, where the tree is *culturally significant*;
- d) whether the *tree* is affected by the provisions of any other Act, Regulation or State Environmental Planning Policy applying to the land (refer to Appendix D);
- e) the potential hazards to persons and/or property in the context of:
  - i) the structural soundness of the particular *tree* (including condition of the canopy, amount of deadwood, any prolonged decline, significant and sustained insect attack, etc); and/or
  - ii) the characteristics and risk potential of the particular species; and/or
  - iii) siting issues such as ground conditions, building proximity, etc, which may give rise to a *hazardous* situation (particularly structural damage to public infrastructure and/or private property caused by the *tree/s*, its *trunk* or its root system); and/or
  - iv) ill health, such as allergies, where specific evidence is provided by an expert in the relevant medical field and a link between the ailment and the species is reasonably established; and/or
  - v) existing (or potential for) traffic obstruction in relation to proximity to a roadway, intersection or driveway, where pruning would be an insufficient remedy;
- f) the demonstrated need for reasonable solar access to windows, openings of a building, solar appliances, clothes drying and outdoor living areas;
- g) whether a *tree* should be replaced by a more suitable species given its location or proximity to services such as overhead powerlines, sewer or drainage pipes or the like;
- h) whether an amenity *tree* no longer fulfils its original purpose in the landscape;
- i) whether the species' natural propagation method is likely to create a nuisance in the landscape (eg, Camphor laurel, Hackberry, Sweet Pittosporum);
- j) whether the proposed work needs to be carried out by a suitably qualified and experienced person;
- k) whether appropriate additional (or replacement) planting has been or should be undertaken;
- l) the need for, and suitability of, soil erosion and siltation controls;
- m) whether permanent and/or temporary fencing or barriers are required prior to works commencing;

n) whether another alternative measure is required to ensure protection of *trees* on-site and on adjoining public land;

o) whether a Section 94 contribution is required towards the replacement of plantings within the same catchment;

p) whether the *tree/s* provide habitat or are a significant component of the habitat of a species listed in Schedule 1 or 2 of the *Threatened Species Conservation Act (TSC Act) 1995* or in Part 13, Division 1, Subdivision A of the *Environmental Protection and Biodiversity Conservation Act 1999* and whether there is a need to assess the significance of the works in accordance with Section 5A of the *Environmental Planning and Assessment Act 1979*;

q) whether, prior to the felling of a *tree*, special measures should be in place to reduce the potential for injury or death of animals likely to inhabit the *tree*. Such measures may include:-

i) inspection of hollows and other potential habitat sites on the *tree*;

ii) sectional dismantling;

iii) supervision of works by an arborist and/or a licensed wildlife carer or handler.

Note: provided that no significant hazard or other safety issues also apply, the following shall not generally be considered as valid reasons to remove a *tree/s* or *native vegetation*:

- Leaf drop (into gutters and downpipes, pools, onto lawns, etc)
- To increase natural light – where that is the sole consideration
- To improve street lighting into private property
- To enhance views or reduce the height of *trees*
- To reduce shade created by a *tree/s* – particularly species such as *Ficus* or *Araucaria*
- To reduce fruit, resin or bird droppings falling onto driveways and/or cars
- Minor lifting of driveways, front fences, paths and footpaths by tree roots
- To erect a fence
- Bushfire hazard control which has not been verified by Council
- Potential damage to sewer mains or stormwater pipes - unless supported by written expert advice and only where reasonable alternatives are not feasible (eg, relocation or encasement of mains, replacement of damaged pipes in PVC plastic).

## EXEMPTIONS

The following works do not require a consent or permit from Council:

a) The removal of *dead trees*, except where *trees* provide habitat for species listed in Schedule 1 or 2 of the *Threatened Species Conservation Act 1995* - NB: Where the *tree* or *trees* provide habitat for animal species listed in Schedule 1 or 2 of the *Threatened Species Conservation Act 1995*, expert advice should be obtained in relation to fauna relocation prior to removal of the *tree*; or

- b) The *removal* or trimming of *trees* in accordance with the *Electricity Supply (Safety Plans) Regulation 1997* and the *Electricity (Tree Preservation) Regulation 1995*; or
- c) The *removal* or trimming of *trees* in accordance with Clauses 88, 107, 138 and 139 of the *Roads Act 1993*; or
- d) The *removal* of noxious weeds within the meaning of the *Noxious Weeds Act 1993*; or
- e) The following *tree* works are defined as exempt *tree* works and do not require a consent from Council:
- i) Deadwooding, Formative Pruning of young *trees* and Powerline Clearance, as defined in Clauses 7.2.2, 7.2.5 and 7.3.6 respectively of Australian Standard AS 4373 – 2007 - *Pruning of Amenity Trees* (refer specifically to Appendix E); or
  - ii) *Removal* of *trees* to give effect to a development in accordance with a consent – i.e., the *removal* of *trees* and *vegetation* located within the alignment of a proposed road or service easement (in accordance with approved engineering plans), or within a proposed building footprint and up to two (2) metres from the external walls of buildings (on the same land parcel), provided that:
    - \* The building or work is consistent with an approved development consent which allows their removal and the *trees* are not shown for retention;
 or
  - iii) *Removal* of any *tree*, that in the opinion of Council or a *qualified arborist* is *dangerous*, only where the *tree's* instability is obvious and there is immediate danger and/or hazard - for example, structurally split *trunks*, *trees* or limbs which have been felled by storms, that are damaging buildings or blocking accessways.
- Except for specified emergency situations, expert advice should always be obtained by the *tree* owner with respect to *dangerous trees* to confirm their condition and to ensure that they do not provide habitat for protected species. Otherwise, their cutting or *removal* might be in breach of the *Threatened Species Conservation Act 1995*.
- Note: If appropriate, the branch *removal* option should be adopted in preference to complete *tree removal*; or
- iv) The *pruning* or *removal* of any *tree/s* under the care, control and management of Randwick City Council in order to abate any potential or actual danger to persons and/or property, provided such works are carried out by persons authorised by the Council and in accordance with AS 4373 – 2007 – *Pruning of Amenity Trees*; or
  - v) Immediate *removal* of *trees* where this is essential for emergency access or emergency works by Council or a public authority; or
  - vi) *Removal* of a *tree(s)* which is a bushfire hazard where:
    - \* The action is reasonably necessary to protect human life, buildings or other property from imminent danger of a bushfire burning in the vicinity of the *tree*; or
    - \* Council has authorised its *removal* as part of a bushfire risk management plan adopted pursuant to the *Rural Fires Act 1997*; or
  - vii) *Removal* of the following 'undesirable species' as listed in Schedule 1 of Council's Tree Preservation Order 2005:

- *Ailanthus altissima* Tree of Heaven
- *Cotoneaster species* Cotoneaster
- *Erythrina species* Coral tree
- *Ficus elastica* Rubber tree
- *Ligustrum species* Privet
- *Nerium oleander* Oleander
- *Ochna serrulata* Ochna
- *Olea europa var. africana* African Olive
- *Schefflera actinophylla* Umbrella tree
- *Syagrus romanzoffianum* Cocos Palm

or

viii) The *removal* of a *tree* or *trees* where such works are provided in a Plan of Management adopted by Randwick City Council in respect of *public land* under the *Local Government Act 1993*; or

ix) *Removal* of *vegetation* within 0.5 metres of the boundary between properties for the purpose of enabling survey to be carried out along that boundary by a registered surveyor, provided that the surveyed land exceeds one (1) hectare in area and no alternative survey method is feasible.

Note: The *removal* or disturbance of an Aboriginal relic is an offence under the *National Parks and Wildlife Act 1974*. A *tree* believed to be, or in the vicinity of, an Aboriginal relic should be examined by an appropriately qualified person and instruction taken before any work commences.

## TREE REMOVAL

It is **REQUIRED** that the *removal* of any *tree* should only ever be undertaken by an *arborist* or *tree worker* with appropriate training and the relevant insurances and any such works must be undertaken in a safe manner that complies with the appropriate WorkCover tree work Code of Practice and *Australian Standard* requirements.

## PROVISION OF EVIDENCE FOR DANGEROUS/HAZARDOUS TREES

Except for specified emergency situations, expert advice is **REQUIRED** to be obtained with respect to *dangerous trees* to confirm their condition and to ensure that they do not provide habitat for protected species. Otherwise, their cutting or removal might be in breach of the *Threatened Species Conservation Act 1995*.

Where a *dangerous tree* is *removed* (in an emergency situation) due to obvious instability or hazard (eg, following storm damage), it is **RECOMMENDED** that evidence of the *tree's* condition should be retained for a period of at least six (6) months after the event and produced at Council's request if needed. Such evidence should, where possible, include:

- i) Photographs of the *tree/s*; and
- ii) A report by a *qualified arborist*; or
- iii) A written statement from the State Emergency Service (SES), if the Service carried out the emergency *tree* works at the owner's request.

Where *trees* have died, been *removed* because of storm damage or *removed* as *undesirable species*, replacement *trees* of a suitable *native* or *indigenous* species are **REQUIRED** to be planted wherever possible to maintain *tree* cover within the City.

## TREE PRUNING

### PRUNING TECHNIQUES

There are a range of pruning practices that should be utilised when undertaking the *pruning* and/or ongoing maintenance of any particular *tree* or *trees* and the most beneficial of these are outlined below.

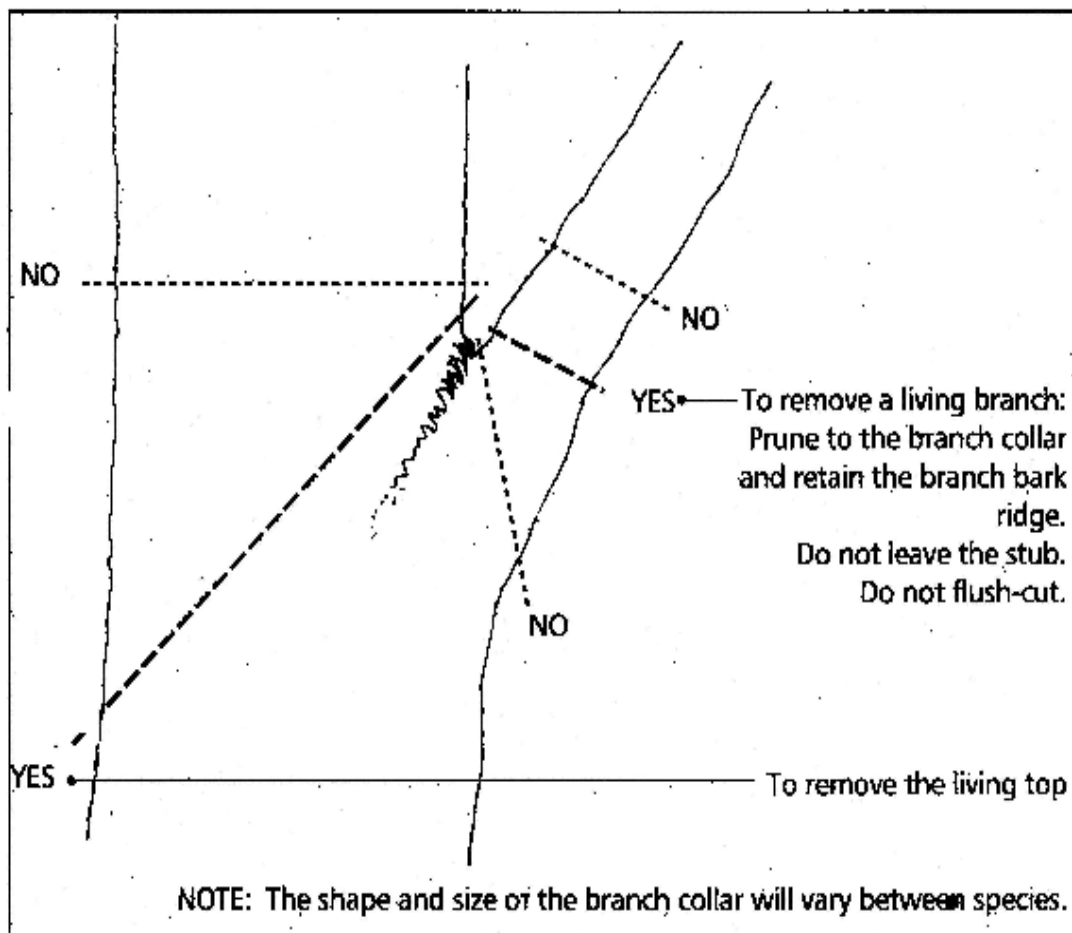
#### Directional Pruning

Directional *pruning* is the *removal* of selected branches to branch collars or to a growing point. The branch collar is the point at which branches are naturally shed. It contains chemicals which inhibit the development of decay-causing organisms and is part of the *tree's* protection system. It is essential that wherever possible *pruning* cuts be made to this point. This technique is shown in Figure 1.1 below.

The purpose of directional *pruning* is to *remove* only the branch or branches causing the problem, be they growing into a building or residence or across a pathway or driveway.

This method, resulting in a more natural appearance to the *tree*, has several advantages over *lopping*:

- Minimal removal of branches
- Little or no increase in growth rate, and
- Minimal suckering from cut branches



**FIGURE 1.1** Positioning of pruning cuts

Directional *pruning* is best achieved when the *tree* is a broad domed species with relatively closely spaced branches and when the *pruning* commences at an early stage.

## Tip Pruning

Tip *pruning* is directional *pruning* where the tips of branches are reduced to lower lateral branches.

This procedure is useful for reworking *trees* consisting almost entirely of vertical shoots if a reasonable depth of crown remains between the required clearances for infrastructure or dropwires or pedestrian access. This technique reduces the apical dominance of the branches, hence slowing the growth rate or at least not invigorating the *tree*.

Adequate foliage is retained, benefiting both the *tree* and the landscape. The technique is shown in Figure 1.2. Many *tree* species respond better to minimal tip *pruning* than to the practice of creating a bare framework.

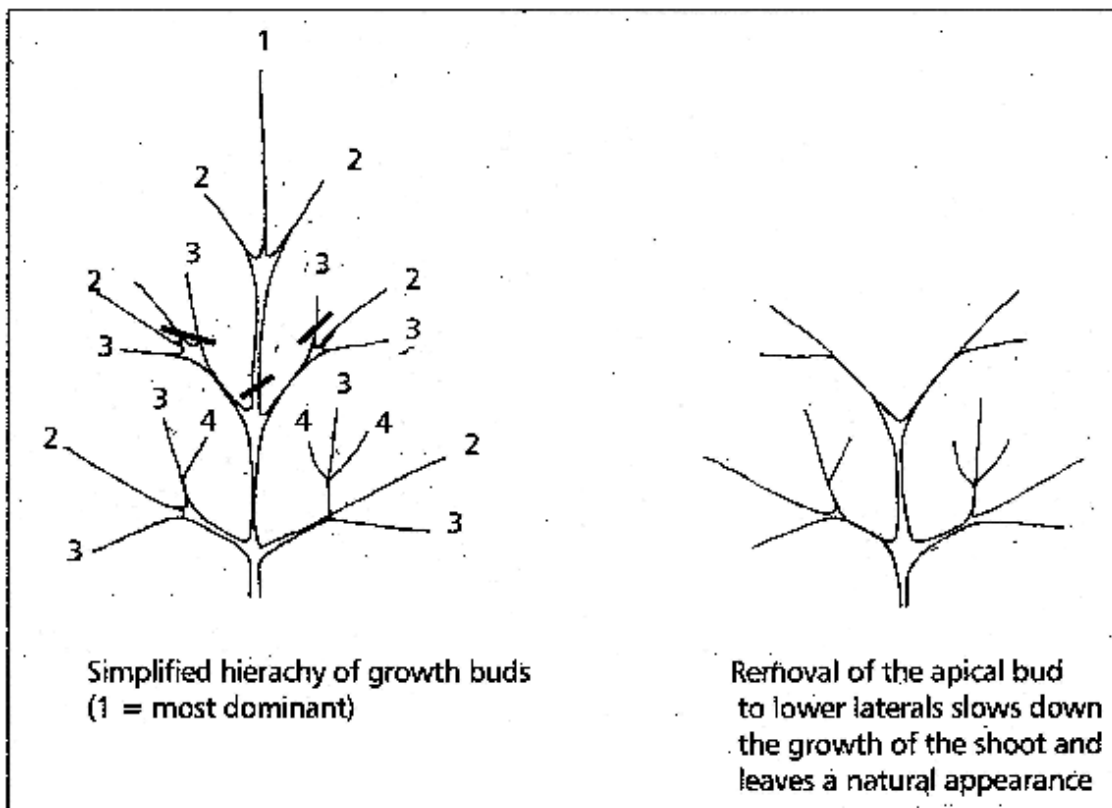


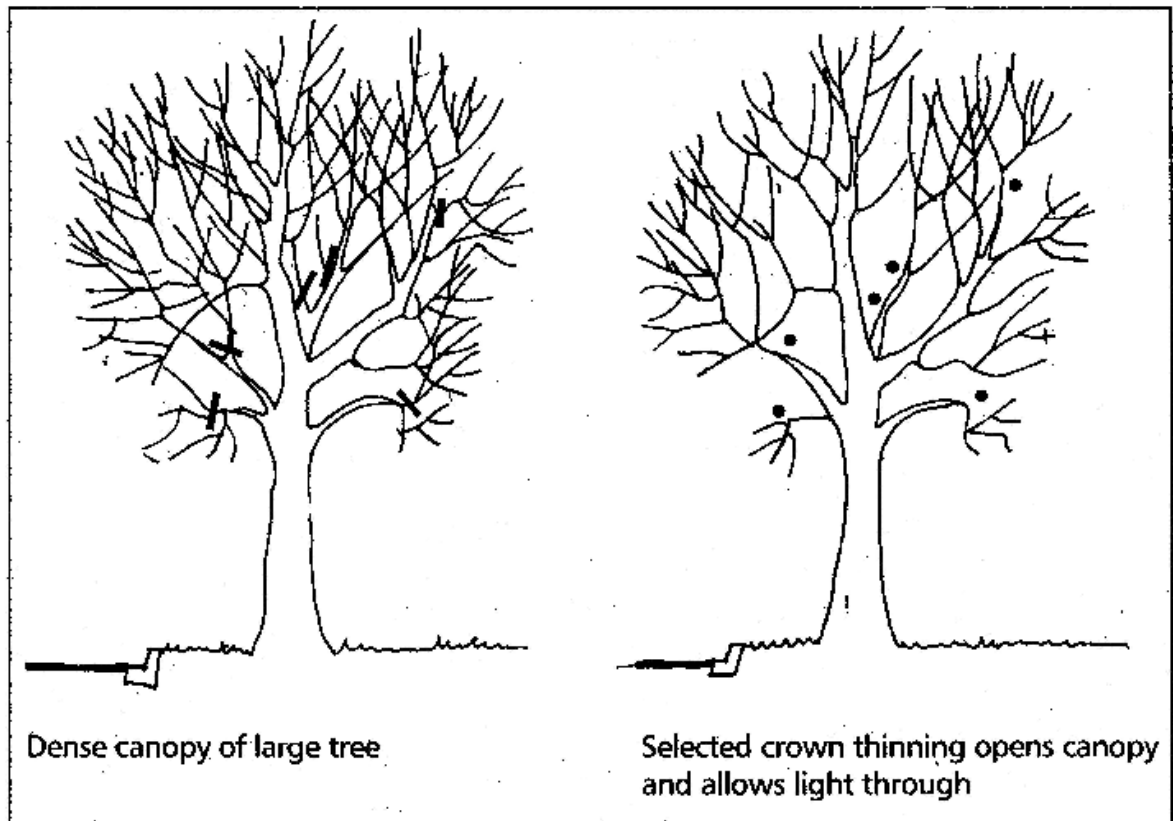
FIGURE 1.2 The Principles of Tip Pruning

## Crown Lifting

Crown lifting is the *removal* of low branches over footpaths, driveways, paving, etc, to ensure adequate clearance and visibility. *Removal* of low branches forces growth toward the top of the *tree*. If these *trees* are also under service wires and powerlines, the net result can be a crown that is too small to work with.

Excessive *removal* of horizontal branches also reduces the functional value of the *tree* by *removing* the branches which shade and screen. On young *trees*, low branches feed the *trunk* and develop *trunk* strength. It is **RECOMMENDED** that crown lifting be done on a gradual basis and that clearances be kept to the minimum requirement.





**FIGURE 1.3 Crown Thinning**

### **Crown Thinning**

The practice of *tree height* reduction has been curtailed in favour of a process of sympathetic thinning to allow more light penetration and wind movement. Thinning involves the *removal* of secondary branches back to the branch collar whilst retaining the main structural branches and hence the overall shape of the *tree*. This technique is illustrated in Figure 1.3 above.

### **Formative Pruning of Trees**

In many urban situations *trees* are planted in relatively confined locations surrounded by a variety of constraints such as underground services, close proximity to neighbouring properties, adjacent to buildings and structures, next to walkways and footpaths, underneath overhead powerlines and service wires, etc.

Even though many of these *trees* may not initially be interfering with structures and/or infrastructure, formative pruning should commence as soon as possible so as to minimise the impact of future growth. Minimal pruning now will represent significant savings in the future.

No precise instructions can be given for *tree pruning* as all *trees* must be treated on an individual basis. Directional *pruning*, tip *pruning* and crown thinning are **RECOMMENDED** where there is sufficient depth of crown and/or suitable horizontal branches to allow these *pruning* types to be carried out.

Generally, though, experience with the *pruning* of *trees* has shown that minimal *pruning* in the early stages results in fewer problems and maintenance costs for the tree in the long term.

As stated previously, all *tree pruning* and associated works are **REQUIRED** to be carried out in accordance with the provisions of Australian Standard AS 4373 - 2007 - *Pruning of Amenity Trees*.

## TREE REPLACEMENT

The *removal* of healthy retainable *trees* from both private property and *public land* is often necessary in order to meet development objectives. However, the loss of *tree* canopy cover reduces public amenity and environmental benefits and should be compensated whenever possible.

Wherever possible, Council will determine that any *tree* approved for *removal* within private property is **REQUIRED** to be replaced with an appropriate number of suitable replacement *trees*. The number and species of *trees* shall be determined by the assessing Council officer and any such replanting determination will generally be required to be complied with within 21 days of the approved *tree* or *trees* being removed, or in the case of development, prior to the issue of a Final Occupation Certificate.

Any replacement planting will be **REQUIRED** to be nurtured and maintained in a healthy and vigorous state until maturity, especially when the removal of the original *tree* or *trees* impacts on neighbours or the streetscape.

Before planting any *tree* it is **RECOMMENDED** that the mature *height* and size of the tree be considered, particularly in relation to:

- services such as gas, water, sewerage, stormwater and domestic service wires
- buildings, footings, pathways
- solar access
- potential overhang into neighbouring properties
- species suitability to the site – *native* and *indigenous* coastal species are recommended

This replacement mechanism is necessary to ensure that *tree* canopy loss from development is compensated wherever possible by replacement plantings, whether on the development site itself or on adjacent *public land*.

## TREE PLANTING AND MAINTENANCE

A Council approved *tree* planting Specification applies to all *trees* planted by Council and all *tree* planting contractors who undertake work on behalf of Council are **REQUIRED** to comply with that Specification.

Where *trees* are **REQUIRED** to be planted by property owners as replacements for those approved for *removal* under the provisions of Council's Tree Preservation Order 2005 or where *tree* planting is a condition of development consent, it is **RECOMMENDED** that property owners plant those *trees* in compliance with Council's *tree* planting Specification.

The Specification details the procedure **RECOMMENDED** for both *tree* planting and subsequent *tree* maintenance and provides the framework for *trees* to have an optimum chance of survival in the longer term.

All *trees* to be planted are **REQUIRED** to be sound, healthy, vigorous and free of diseases and insect pests and they are not to be *topped* or headed.

NOTE: Prior to the commencement of any excavation or *tree* planting activities, it is strongly **RECOMMENDED** that property owners and/or planting contractors undertake a search for underground services. Information on locating underground pipes, cables and other services can be obtained by telephoning Dial Before You Dig on 1100 or by logging onto [www.dialbeforeyoudig.com.au](http://www.dialbeforeyoudig.com.au)

## PLANTING PROCEDURE

This planting procedure applies to the planting and maintenance of 25-litre plant stock only and should be appropriately modified if planting larger stock.

Dimensions of planting holes are as specified in the Planting Detail (Figure 1.4). Planting holes are to be at least 600mm in diameter and no less than 500mm deep wherever possible.

- (a) Excavate a hole as indicated in the Planting Detail. Break up the base and sides of the hole a further 100mm with, for example, a pick, mattock or crowbar;

NOTE: Excavation is measured in other than rock. It is not intended that rock be excavated to plant *trees*. If rock is encountered, an alternative planting site should be sought.

- (b) Remove plant from container, slightly tease the root ball and then place plant into hole. Top of root ball should be planted level with surrounding soil;
- (c) Backfill the hole, lightly firming down in 150mm layers. Soil mix shall be:
  - i) 80% site soil, and
  - ii) 20% humus (eg, organic matter, potting mix, garden soil mix);
- (d) Soil mix shall have a pH range of 5.5 to 6.5 and shall be free of noxious weeds and toxic materials detrimental to plant growth;
- (e) Wetting agent and slow release fertiliser are to be incorporated into the planting operation at the manufacturer's recommended rate;
- (f) Mulch the soil surrounding the *tree* to a diameter of 500mm all around the *tree trunk* and to a depth of 75mm. Do not heap mulch around the *trunk* and ensure that it is 'dished' around the base of the *tree*;
- (g) All *trees* shall be formatively *pruned* at the time of planting to ensure that all sucker growth is removed and that *trees* have one central leader only. *Trees* should be underpruned to the extent that the canopy constitutes one third only of the *tree's* total *height*;
- (h) Stake the *trees* as shown on the attached Planting Detail using 2 x 50mm x 50mm x 1500mm hardwood stakes. *Trees* are to be supported with two lengths of 50mm wide nylon or hessian tie stapled to stakes;
- (i) Water in well after planting using at least 10 litres of water for each *tree*.

## MAINTENANCE PROCEDURE

- (a) All *trees* are to be watered thoroughly and each *tree* shall receive an amount of water that will ensure healthy, vigorous growth – at least ten (10) litres of water per *tree* per watering episode;
- (b) Maintenance and watering of all planted *trees* are to continue for a period of at least six (6) months from the completion of planting of all designated *trees*; and
- (c) The contractor/property owner shall ensure that they undertake the weeding, adjustment and/or replacement of stakes and ties, minor pruning work and re-instatement of mulch as required during the establishment period – which shall be a minimum of six months.

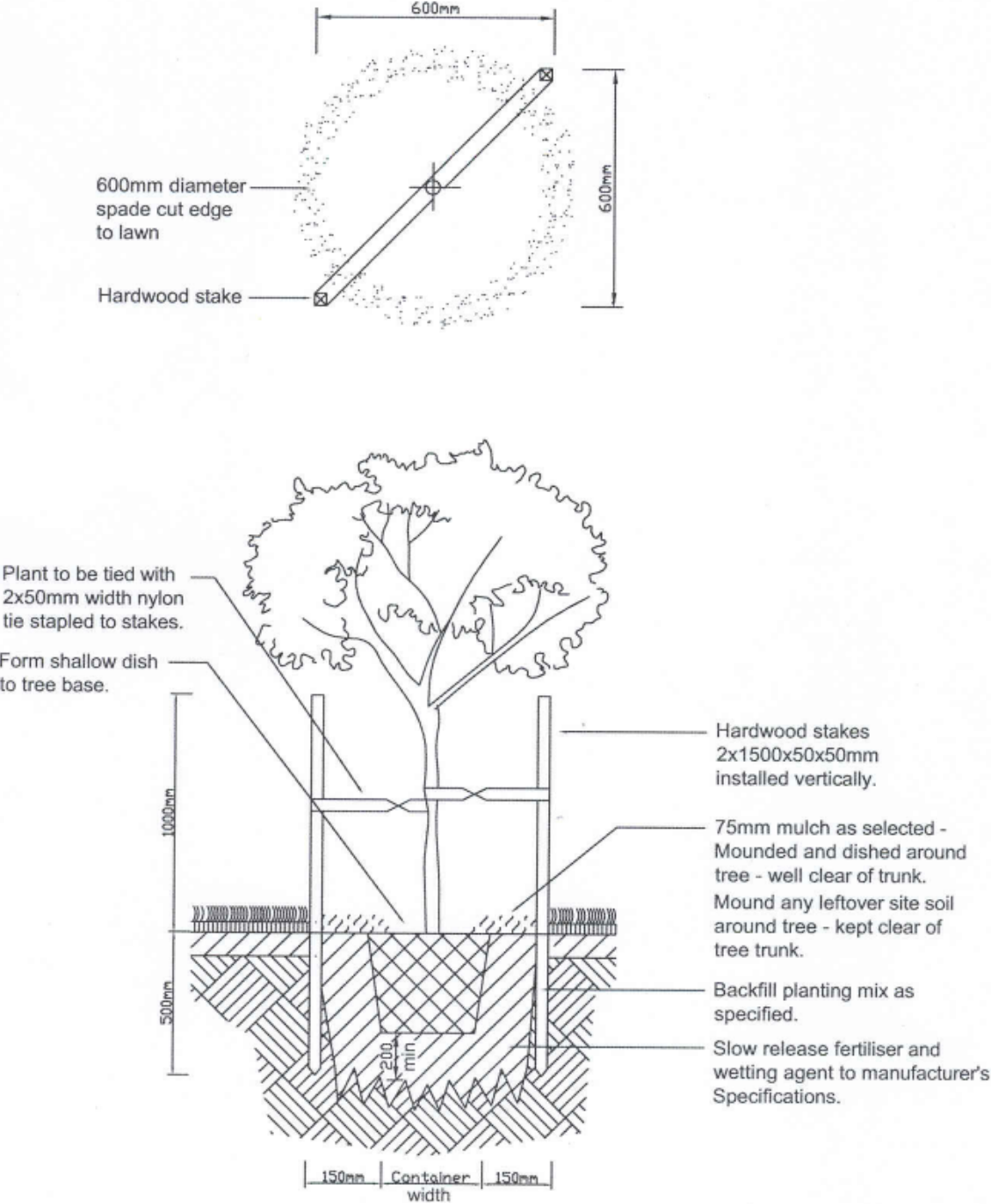


FIGURE 1.4 Planting Detail

## RECOMMENDED TREE SPECIES

Council **RECOMMENDS** the planting of *native* and *indigenous* plant stock whenever possible to provide habitat and food source for native birds and other fauna and to enhance *wildlife corridors* and *buffer zones* throughout the City area.

At the same time it recognises that *tree/shrub* species selection is often quite subjective and that it often depends on the age of a particular property or the precinct in which it is located or that it may simply depend on the property owner's personal preferences.

In order to complement the broad objectives of Council's Street Tree Masterplan it is **RECOMMENDED** that property owners and other stakeholders consider planting trees and shrubs contained within the Masterplan document. Listed *trees* are a mix of *native*, *exotic* and *indigenous* species.

These *tree/shrub* species are described in detail in Council's Street Tree Identification Manual and this can be downloaded as a PDF document from Council's website. The species nominated for planting in both documents are listed in Appendix F of this manual.

## TREE/ARBORIST REPORTS

Professional *arborists* are **REQUIRED** to prepare any *arborist's* report lodged with Council. The minimum accepted qualification for an *arborist* is the Australian Qualification Framework level 4 (AQF4).

Where *trees* are deemed by Council to be *culturally significant*, (i.e., those listed in Randwick City Council's Register of Significant Trees) a report is **REQUIRED** to be prepared by a *qualified arborist*. The minimum accepted qualification for a *qualified arborist* is the Australian Qualification Framework level 5 (Diploma) (AQF5).

The following information is **REQUIRED** to be included in any arborist's report:

- a) name, address, telephone number, ABN, qualifications and experience of the *arborist* carrying out the inspection and reporting;
- b) address of the site containing *tree/s*;
- c) who the report was prepared for, date site inspected, date report prepared and the aims of the report;
- d) methods and/or techniques used in the inspection;
- e) a plan (to scale) accurately showing:
  - i) location of *tree/s* on the subject site and any adjoining *trees* which may be affected by any development. *Trees* identified on the plan shall be named and numbered;
  - ii) optimum and minimum *tree* protection zones - if recommended by the *arborist*;
  - iii) lot boundaries, dimensions and North point;
  - iv) proposed development including services, driveways and any alteration to existing and proposed soil levels and drainage, as well as distances (in mm) between *tree/s* and works.

f) a table showing, for each *tree* to be *pruned/removed*:

- i) number of the *tree* - as indicated in the plan;
- ii) species name;
- iii) age class;
- iv) *height*;
- v) canopy *width*;
- vi) *trunk* circumference at one (1) metre above ground level;
- vii) health and condition, and estimated Safe Useful Life Expectancy.

g) a discussion of other relevant information, including details of *tree* hollows for wildlife, *tree* structure/defects, root form and distribution, pests and diseases and/or a Tree Hazard Assessment;

h) supporting evidence such as photographs and laboratory results to confirm the presence of soil pathogens or to support soil assessment, where relevant;

i) proposed replacement plantings, landscaping and/or soil remediation;

j) *tree* protection measures and a post-construction *tree* maintenance program which can be used as development consent conditions, should the application be approved;

k) sources of information referred to in the report;

l) measures to minimise impacts of proposed/approved development - eg, footing designs, excavation techniques, vents to atmosphere, etc;

m) any other relevant matters or information such as Resistograph or Picus Sonic Tomograph reports.

Qualified *arborists* and their contact details may be obtained from the Institute of Australian Consulting Arboriculturists (IACA) on (02) 9682 7033 or on its website at [www.iaca.org.au](http://www.iaca.org.au) or from the National Arborists' Association of Australia (NAAA) on (02) 4739 4339 or at [www.naaa.net.au](http://www.naaa.net.au)

These organisations are not specifically recommended and Council will accept arborist's reports from any registered member of a nationally recognised arboricultural organisation or association.

## TREES ON DEVELOPMENT SITES

This section details the negative impacts that development and construction can have on established *trees* and provides a range of measures designed to minimise the adverse impacts of development on retainable and *significant trees*.

Typical adverse impacts on *trees* that can occur during construction works include:

- mechanical injury to roots, *trunks* or branches by site machinery, scaffolding

- compaction of soil by vehicular/pedestrian movement which degrades functioning *tree* roots and inhibits new root development, as well as contributing to fungal disease infiltration
- changes in soil profile or soil level, which can sever or suffocate *tree* roots
- alteration of the water table – either raising, lowering or re-directing water flow
- microclimate changes – exposing previously sheltered *trees* to increased sun and wind

For development on land which contains any *trees* which are covered by Council's Tree Preservation Order 2005 or trees which are listed in Council's Register of Significant Trees and which are located within six (6) metres of any proposed development works (including neighbouring properties) and where there is potential for such *tree/s* to be affected in any way by a proposed development, there are a number of matters that are **REQUIRED** to be addressed prior to the commencement of any works.

On any such site the property owner may be **REQUIRED** through conditions of consent to ensure that a comprehensive *tree* report is prepared by a *qualified arborist* that assesses the impact of the proposed development on *trees* and *vegetation* both within the site itself and on adjoining properties.

That report must contain a *tree* protection plan (refer to Appendix G) as well as recommendations for mitigating any adverse impacts on *trees* designated for retention. Any such report must provide site specific details of both the Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) areas surrounding any trees to be retained. The calculation of SRZ and TPZ radiuses must comply with the calculation methodologies detailed in Section 3 of Australian Standard AS 4970 – 2009 – *Protection of Trees on Development Sites*.

This report must also contain *tree* protection measures and a post-construction *tree* maintenance program which could be incorporated into development consent conditions.

In order to make sure that all these conditions are met and clearly understood by all parties and to ensure that retained *trees* are afforded appropriate protection, the following actions are **REQUIRED** to be strictly complied with:

### 1) Site Plan

On all site plans associated with the development, the property owner is **REQUIRED** to ensure that all *tree trunk* locations and the canopy *widths* of all *trees* or groups of *trees* to be preserved within the development (and adjoining properties, if appropriate) are clearly identified and accurately plotted on any such plans.

In addition, those plans shall clearly indicate to scale the extent and location of any *tree* protection zones to be erected around protected *tree/s*.

### 2) Verification of Tree Protection

The project manager or *arborist* may be **REQUIRED** as a condition of consent to verify, in writing, that all requested tree protection conditions (eg, *tree* protection fencing, *pruning*, erosion control) have been complied with prior to commencement and during the course of works.

### 3) Pre-construction Meeting

The applicant is requested in the first instance to review their conditions of development consent for clarification on tree matters, as requirements can vary from site to site.

The DA may require the property owner, construction supervisor and project *arborist* to meet with Council's Landscape Development Officer on-site prior to the commencement (or during critical stages) of works to review procedures, assess *tree* protection measures, and to ensure that the installation of *tree* protection zones has been complied with.

The property owner is advised to pay particular attention to issues such as site access and machinery access requirements, as well as soil/materials storage areas.

#### 4) Protective Fencing for Protected/Designated Trees and Street Trees

Wherever practicable, fenced enclosures are **REQUIRED** to be erected around *trees* to be protected to achieve three primary objectives:

- To keep canopies and branches clear from contact by equipment, materials and activities;
- To preserve *tree* roots and surrounding soil in a non-compacted state;
- To clearly identify the Tree Protection Zone where no soil disturbance or activities are permitted.



**FIGURE 1.5 Tree Protection Fence on Nature Strip**

##### ○ Size and Type of Fence

Fencing is **REQUIRED** to be constructed from 1.8-metre high chain link wire or welded mesh suspended by galvanised steel pipe or equivalent (Figures 1.5 above) and it is **RECOMMENDED** that it should be erected (wherever possible) directly underneath the dripline of any trees to be retained.

Fencing is **REQUIRED** to be erected before demolition, grading or construction works begin and shall remain in place until the completion of ALL works.



Signs are **REQUIRED** to be prominently displayed on these fences and must clearly display the following wording - 'Tree Protection Zone – Keep Out' (Figure 1.6 below).

The enclosed area is **REQUIRED** to be mulched, irrigated and kept free from building materials and/or contaminants and must not be used for storage of any building materials.

#### ○ Trunk Protection Measures

Where it is not possible or it is impractical to install *tree* protection fencing, *trunk* protection measures are **REQUIRED** to be undertaken. Lengths of timber (100mm x 50mm x 2000mm) should be used to protect the *tree's trunk* during construction works. The lengths of timber should be laid over geo-textile, underfelt or layers of hessian and fastened around the *trunk* at 200mm centres with hoop iron strapping or similar.



**FIGURE 1.6** Tree Protection Zone signage

### 5) Tree Protection Zone

Tree Protection Zones are areas specifically set aside to ensure that retained *trees* are adequately protected during development and construction activities. Each *tree* to be retained is **REQUIRED** to have a designated Tree Protection Zone segregating an area sufficiently large enough to protect the *tree* and its roots from disturbance or damage.

The **REQUIRED** Tree Protection Zone for any *tree* should wherever possible extend to at least the dripline of any protected *tree*. Where this is not possible the zone should extend as far as possible in all directions from the *trunk* of the *tree*.

The Tree Protection Zone shall be clearly shown on all site plans for the development.

○ **Mulching**

Wherever *tree* protection fencing is installed, the area inside the Tree Protection Zone is **REQUIRED** to be mulched to a depth of at least 100mm or more using composted green waste mulch. The mulch should be free of weed seeds and other contaminants.

○ **Soil Compaction**

During construction works there may be considerable traffic movement associated with general construction activities. Reducing traffic volumes and limiting machinery and vehicular access to specified tracks will reduce the effect on adjacent *trees*.

Should heavy and regular vehicular access be required onto the site, it is **RECOMMENDED** that an access track should be formed using large diameter railway ballast (100mm) over a geo-fabric or a corduroy of heavy timbers.

○ **Irrigation**

Where the construction process reduces water availability to a retained *tree*, it is **REQUIRED** that temporary irrigation be provided to the *tree*'s root zone to maintain adequate soil moisture levels.

○ **Erosion Control**

If a retained *tree* is adjacent to or in the immediate vicinity of a graded slope of eight degrees or more, approved erosion control or silt barriers are **REQUIRED** to be installed outside the Tree Protection Zone to prevent siltation and/or erosion within that zone.

Activities prohibited within the Tree Protection Zone include:

- Storage of building materials, refuse, excavated spoils or dumping of toxic materials on or around *trees* and *tree* roots. Toxic materials include, but are not limited to, paint, petroleum products, concrete, stucco mix, dirty or contaminated water or any other material which may be detrimental to *tree* health;
- The use of *tree trunks* as a winch support, anchorage, as a temporary power pole, sign post or other similar function;
- Severing of *tree* roots by utility trenching, foundation excavation, placement of kerbs and other miscellaneous excavation without Council approval;
- Soil, grade or drainage changes – particularly altering soil levels by any more than 200mm, as this is a violation of Council's Tree Preservation Order 2005.

Any approved excavation within a development site which is required for footings, structures, retaining walls, basement car parks, services, pipes, detention tanks, stormwater infiltration systems, paving, etc, shall be undertaken by hand and only under the direction of a *qualified arborist*, with all roots being cleanly cut where required.

## STREET TREES AND DEVELOPMENT

Where established Council-owned street *trees* are designated for retention, protective fencing is **REQUIRED** to be constructed around any such *trees*. This fencing is to be erected before demolition, grading or construction works begin and shall remain in place until the completion of ALL works.

The fencing is **REQUIRED** to be constructed from 1.8-metre high chain link wire or welded mesh suspended by galvanised steel pipe or equivalent and it is **RECOMMENDED** that it should be erected (wherever possible) directly underneath the dripline extremity of any street *tree/s* to be retained.

Signs are **REQUIRED** to be prominently displayed on these fences which clearly display the following wording - 'Tree Protection Zone – Keep Out'.

The enclosed area underneath any street *tree* is **REQUIRED** to be mulched and kept free from building materials and/or contaminants and must not be used for storage of any building materials.

A refundable deposit in the form of cash, cheque or bank guarantee will often be **REQUIRED** to be lodged with Council to ensure compliance with relevant consent conditions and, ultimately, to ensure the retention of protected street *tree/s*.

This deposit will be eligible for refund at the completion of all site works, but only after a satisfactory inspection of any protected street *tree/s* has been completed by Council's Landscape Development Officer.

The contravention of any Council development consent conditions relating to a protected *tree* at any time during the course of works may result in Council claiming all or part of any lodged security in order to perform any rectification works required.

## STREET TREE REMOVAL

If Council authorises the *removal* of a street *tree* as part of a development approval, it shall detail the *tree removal/replacement* requirements in writing in the development consent document. This is often applicable where approved development includes the construction of a driveway crossover into a property.

The cost to the property owner to *remove* a Council *tree* asset is determined by calculating the amenity value of the subject *tree/s*, with this value then being amalgamated with the cost for Council to *remove* the *tree* and to replace it (where appropriate) with another *tree/s* at the completion of works.

The amenity value of a *tree* or *trees* is calculated by utilising the draft Australian Standard *DR 99307 – Amenity Trees – Guide to Valuation* (refer to Appendix H) with the *removal* and/or replacement component being calculated by the assessing Council officer.

Where the subject street *tree* is diseased or dying or is an 'undesirable species' no amenity value will be incorporated into any such calculation.

The total cost of such work is **REQUIRED** to be paid to Council by the property owner prior to any approved *removal/replacement* works being undertaken by Council.

Unless otherwise specified, all work undertaken on Council street tree assets shall only be performed by Council or its authorised agents.

All Council *tree* assets that are *removed* as part of Council's ongoing *tree* maintenance regime are to be *removed* in compliance with adopted Council policies and procedures and all such works are to comply with the appropriate *Australian Standard*.

### STREET TREE ROOTS AND PUBLIC/PRIVATE INFRASTRUCTURE

Conflicts often arise when Council street *trees* are growing adjacent to paving, driveways, footpaths, kerb and gutter and other public and private infrastructure. Careless or improper *removal* of these elements may cause severe injury to the roots and instability or even the death of affected *trees*.

The following measures must therefore be evaluated before the root cutting of any Council street *tree* asset is undertaken.

- Grinding raised footpath and/or driveway slabs
- Substituting concrete with asphalt where possible
- Re-directing the footpath or kerb and gutter around or away from *tree* roots
- Installing flexible or rubberised footpath sections

Where these options are not feasible and *tree* roots are required to be severed, the following procedure is **REQUIRED** to be complied with by both Council staff and/or contractors:

1. Roots less than 50mm in diameter may be severed without a Council *tree* officer or *arborist* in attendance but must be cleanly cut with appropriately sharp tools;
2. Roots greater than 50mm in diameter are only to be severed with the approval of a Council *tree* officer who has assessed the *tree/s* on-site;
3. All roots to be severed are to be cleanly cut with sharp tools such as secateurs, hand saws, long handled pruners, chainsaws, or specialised root *pruning* equipment;
4. Wherever possible, the roots to be *pruned* should be located and exposed using techniques such as hand digging, compressed air or water jetting, or mapped using non-invasive methods such as ground penetrating radar.

Prior to the root pruning of ANY Council tree asset, detailed calculation of the tree's Structural Root Zone (SRZ) area must be undertaken to determine whether any required root cutting is actually feasible.

It is generally accepted that twenty percent (20%) root loss can be tolerated by most tree species and that wind throw is unlikely where any excavation takes place outside Structural Root Zone offsets.

However, wherever possible, no root pruning activities should take place within the following recommended radial distances from any Council owned tree on public land:

Trunk Diameter @ DBH	Restricted Radial Distance
Less than 200mm	2 metres
Between 200mm – 400mm	3 metres
Greater than 400mm	4 metres

If the amount of root material requiring removal exceeds twenty percent of the Structural Root Zone area, particularly in the case of large *Ficus macrocarpa* var. 'Hillii' (Hill's Weeping figs), then a report is to be prepared for Council recommending the removal and replacement of any such tree/s because root pruning would not be a viable management option.

This procedure is certainly **REQUIRED** to be implemented in cases where public tree roots are causing damage to private property, where any such damage extends beyond simply causing minor damage to front fences, driveways, etc, to causing actual damage **WITHIN** the property.

A more detailed overview of the methodology utilised in the calculation of SRZ and TPZ radiuses is contained in Appendix G of this document.

When Council staff and/or contractors are removing footpath slabs, driveways, kerb and gutter, road pavement sections or foundations located above *tree* roots, the following procedure is **REQUIRED** to be adhered to wherever possible:

1. Break concrete, bitumen, sandstone, etc, into manageable pieces with a jackhammer, crowbar or mattock and load pieces onto a truck or loader;
2. Footpath slabs or driveway slabs should only be removed by a backhoe or bobcat if that machinery can undertake those works without driving on or manoeuvring over *tree* roots;
3. If hardscape materials are to be loaded onto a truck or loader those vehicles must remain on undisturbed footpath or the adjacent roadway during loading operations.

## REFERENCES

- Australian Standard AS 4373 – 2007 – *Pruning of Amenity Trees*. Standards Association of Australia. Sydney.
- Australian Standard AS 4970 – 2009 – *Protection of Trees on Development Sites*. Standards Association of Australia. Sydney.
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- City of Palo Alto (2001), *Tree Technical Manual* (First Edition), Palo Alto, California.
- EnergyAustralia (2002), *Tree Safety Management Plan*. Energy Australia.
- EnergyAustralia (2004), *Trees and Powerlines* (Internet) – [www.energy.com.au](http://www.energy.com.au)
- Newcastle City Council (2005), *Newcastle DCP 2005*, Newcastle City Council.
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- Randwick City Council (2007), *Register of Significant Trees*, Randwick City Council.
- Statewide (2003), *Best Practice Manual - Trees and Tree Root Management* (Version 2) – Statewide. Sydney.

## **APPENDIX A**

### **RANDWICK CITY COUNCIL**

#### **Tree Preservation Order 2005**

On Tuesday, 26 July, 2005, the Council of the City of Randwick resolved to make this Tree Preservation Order (TPO) and to rescind all other Tree Preservation Orders on and from its coming into force. Notice of the making of this Order was published on 26 August, 2005, in the *NSW Government Gazette (No 107)* and on 23 August, 2005, in the *Southern Courier* and on 24 August, 2005, in the *Wentworth Courier*.

#### **1. Introduction**

- a. This Tree Preservation Order (TPO) is made pursuant to Clause 28 of the Randwick Local Environmental Plan 1998 (RLEP).
- b. The objectives of the TPO are:
  - i. to encourage the proper management of trees within the City of Randwick for the purpose of promoting a better environment;
  - ii. to encourage the planting, maintenance and healthy and safe preservation of appropriate trees for the benefit of the community;
  - iii. to ensure the conservation of the environmental heritage and aesthetic character of the City;
  - iv. to promote, protect and enhance the environmental qualities of the City;
  - v. to recognise the importance of ecological sustainability in the planning and development processes; and
  - vi. to establish procedures for the proper management of trees in order to minimise the unnecessary loss of significant tree resources.

#### **2. Land to which this TPO applies**

This TPO applies to all land within the Local Government area of the City of Randwick.

#### **3. Trees covered by this TPO**

The trees covered by this TPO are:

- a. any palm tree, cycad or tree fern;
- b. any tree in bushland;
- c. any tree on public land; and
- d. any other tree with:
  - i. a height equal to or exceeding 6 metres; or
  - ii. a canopy width equal to or exceeding 4 metres; or

- iii. for a single trunk tree species, a trunk circumference equal to or exceeding one (1) metre at a height of one (1) metre above ground level; or
- iv. for a multi-trunk tree species, a combined trunk circumference (measured around the outer girth of the group of trunks) equal to or exceeding one (1) metre at a height of one (1) metre above ground level.

#### 4. Prohibition on ringbarking, etc, any tree

- a. Subject to subclause (b) of this Clause 4 a person must not on land to which this TPO applies ringbark, cut down, top, lop, remove, injure or destroy any tree covered by this TPO without the consent of the Council.

Note: Pruning, transplanting, root cutting and poisoning a tree would come within this prohibition as would indirect activities that could injure a tree, such as altering the soil level by more than 200mm within 3 metres of the trunk of a tree. Consent for such activities is therefore required.

- b. Subclause (a) of this Clause 4 does not apply:
  - i. where it can be demonstrated to the satisfaction of the Council that the tree is dying, dead or has become dangerous;
  - ii. where the tree is dealt with in accordance with a permit granted under Clause 5;
  - iii. to the trimming or removal of a tree under section 48 of the *Electricity Supply Act 1995*;
  - iv. to the pruning of any tree in accordance with the Australian Standard to provide 0.5 metre clearance of insulated domestic electricity supply cables;
  - v. to any work carried out by the Council, the State Emergency Services or a person authorised by either of them for safety reasons in response to an emergency;
  - vi. to the pruning, maintenance, removal or replacement of any street tree, park tree or other tree in a public space or on public land under the care, control and management of Randwick City Council in order to abate any potential or actual danger to persons and/or property and provided such pruning, maintenance, removal or replacement is carried out by persons authorised by Council and in accordance with the Australian Standard;
  - vii. to any tree growing within two (2) metres of any building comprising a residential dwelling (detached, attached or multi-unit housing) or any retail, commercial, factory, warehouse or storage building (not being an out building) measured horizontally from the closest point of the trunk at one (1) metre from ground level to the closest point of the vertical alignment of the building structure which may be the eave, guttering or fixed awning of the building;
  - viii. to the control, removal or destruction of any tree of a species of plant declared under the *Noxious Weeds Act 1993* to be a noxious weed in respect of land within the City of Randwick;
  - ix. to the removal, transplanting or pruning of any tree of a species in the table below, so long as the work is done in accordance with Australian Standard.



<b><u>Botanical Name</u></b>	<b><u>Common Name</u></b>
<i>Ligustrum species</i>	Privet
<i>Ailanthus altissima</i>	Tree of Heaven
<i>Ficus elastica</i>	Rubber tree
<i>Schefflera actinophylla</i>	Umbrella tree
<i>Ochna serrulata</i>	Ochna
<i>Nerium oleander</i>	Oleander
<i>Cotoneaster species</i>	Cotoneaster
<i>Erythrina species</i>	Coral tree
<i>Syagrus romanzoffianum</i>	Cocos palm
<i>Olea europea var. africana</i>	African Olive

## 5. Permit

- a. Application for a permit to deal with a tree must be made in writing on the application form available from the Council and be accompanied by the administration fee determined from time to time by the Council.
- b. The administration fee is to cover the cost of administration, site visit, assessment and determination of the application. It is non-refundable.
- c. Before granting a permit the Council must make an assessment of the importance of the tree or trees concerned in relation to:
  - i. soil stability and prevention of land degradation, and
  - ii. scenic or environmental amenity, and
  - iii. vegetation systems and natural wildlife habitats.
- d. In granting a permit the Council may impose conditions including but not limited to the following:
  - i. requiring a copy of the permit to be displayed on the land where the work covered by the permit is to be carried out for a specified period before and after the carrying out of the work;
  - ii. requiring the permit to be available for inspection by an officer of the Council during the carrying out of the work covered by the permit;
  - iii. where the permit allows for the destruction or removal of a tree or trees, requiring the planting of a replacement tree or trees;
  - iv. where replanting is made a condition of a permit, requiring the protection and care of the new tree or trees for a specified period so that the tree or trees remain in good health and are likely to reach natural size and maturity;
  - v. specifying the period during which the permit will remain in force being not more than one (1) year from the date it is granted;
  - vi. providing that the permit will cease to have effect if a development application is lodged where the proposed development includes work covered by the permit.

## 6. Penalties

Contravention of this TPO is an offence against the *Environmental Planning and Assessment Act 1979* which provides:

- a. that a person guilty of an offence against the Act shall, for every such offence, be liable to a penalty; and
- b. that where a person is guilty of an offence involving the destruction of or damage to a tree the Court dealing with the offence may, in addition to or in substitution for any pecuniary penalty imposed or liable to be imposed, direct that person;
  - i. to plant new trees and vegetation and maintain those trees and vegetation to a mature growth; and
  - ii. to provide security for the performance of any obligation imposed under paragraph (i) of this subclause (b).

Note: See s126 for the penalty amount. At the date of this TPO the maximum penalty for an offence under the Act is \$1,100,000 or \$110,000 if the proceedings for the offence are brought in the Local Court.

## 7. Information for Applicants

- a. Where a tree is listed as a heritage item in Schedule 3 to the RLEP or is within a heritage conservation area or is listed on Council's Register of Significant Trees, development consent is required for development that involves demolishing (removing), defacing (pruning/lopping), damaging (including root cutting) or moving the tree and a permit will not be sufficient to authorise any such activity.
- b. Where a tree is located on public land and is causing view loss to the occupier of neighbouring private land, application may be made to Council for a permit in accordance with clause 5 above to prune the tree for the purpose of reducing view loss PROVIDED that: any such application for permit is supported by a report of a suitably qualified arborist detailing the proposed pruning and certifying that such pruning will not compromise the health or integrity of the tree and will be carried out in accordance with the Australian Standard.

If the permit is granted, the proposed pruning must be carried out to Council's satisfaction by a suitably qualified arborist at the cost of the applicant.

Note: Nothing in this subclause 7b. shall be construed to fetter Council's discretion in determining the application for permit.

- c. Where the Council refuses to grant a permit to deal with a tree or grants a permit subject to conditions with which the applicant is dissatisfied, there is no right of appeal to the Land and Environment Court. However, such refusal does not preclude the applicant from lodging an application for development consent to deal with the tree. Should the Council refuse the development application or grant it subject to conditions with which the applicant is dissatisfied, the applicant may then appeal to the Land and Environment Court against the refusal of development consent or the conditions of that consent, as the case may be.

## 8. Definition of Terms

- a. Unless the context indicates otherwise, words used in this TPO have the same meaning as those words have in the RLEP.
- b. In this TPO,

**Australian Standard** means Australian Standard AS 4373 - 2007 *Pruning of Amenity Trees*;

**bushland** has the same meaning as that defined in *State Environmental Planning Policy No. 19 - Bushland in Urban Areas*;

**height** means the distance measured vertically between the horizontal plane of the lowest point of the base of the tree which is immediately above ground and the horizontal plane of the uppermost point of the tree;

**public land** means any land which the public use or are entitled to use for a public purpose including but not limited to a public reserve, a public place, a public road, crown land, community land, public open space, a public walkway and a common;

**tree** means a highly compartmentalised, perennial, woody (or fibrous) shedding plant that is usually tall, single stemmed and long lived;

**width** means the distance measured horizontally (in metres) between the two widest points of the tree's canopy.

# APPENDIX B



## APPLICATION FOR PERMIT TO PRUNE/REMOVE TREE/S

[Clause 28 (6) of the Randwick LEP 1998 and Randwick Tree Preservation Order 2005]\*

**Applicant Name:** .....

**Postal Address:** .....

**Postcode:** .....

**Phone:** (H) ..... (W) ..... (Mob) ..... (Fax) .....

**Site Address:** .....

**Address where tree is located:** .....

**Signature of Applicant:** .....

**Owner's Consent:** *(If applicant is NOT the owner of the property, I the owner/ Managing Agent/Secretary of the Body Corporation consent to the lodging of this application)*

**Name:** .....

**Postal Address:** .....

**Signature:** .....

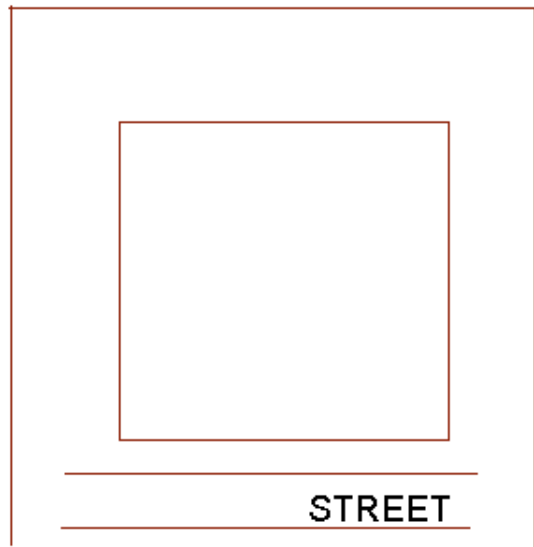
**Date:** .....

### APPLICATION TYPE

- Application to prune (PRU)
- Application to remove (REM)

Will it be necessary for the inspection officer to make special arrangements for access onto the property?

- Yes
- No



Indicate on the site plan above the position of tree/s

### TREE INFORMATION

<i>Tree 1</i>	<i>Tree 2</i>	<i>Tree 3</i>	<i>Tree 4</i>
Species: .....	Species: .....	Species: .....	Species: .....
Height: .....	Height: .....	Height: .....	Height: .....
Canopy Width: .....	Canopy Width: .....	Canopy Width: .....	Canopy Width: .....

### REASONS FOR THIS APPLICATION

- Inappropriate location
- Inappropriate Species
- Structural Damage
- Plumbing problems
- Overhanging Residence
- Overhanging Neighbours
- Overhanging Wires
- Diseased
- Dying
- Dangerous
- Solar Access
- Obstruction/Views
- Other (please specify) .....

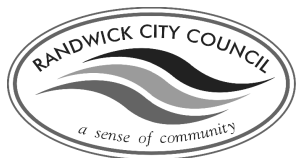
**Please attach all necessary reports and any documentation which may assist in assessing this Application**

\* NB. Development consent is required to prune/remove any tree within a Heritage Conservation Area or which is listed in Schedule 3 – Heritage Items of the Randwick LEP 1998. This form is NOT an Application for Development Consent. To obtain development consent to prune/remove any such tree you must complete a Development Application for Tree Works.

-----  
**OFFICE USE ONLY**

Application No. : TA/ \_\_\_\_\_ / \_\_\_\_\_      Inspection Fee: Mon-Fri - \$36.95 Sat/PHol - \$79.15      Receipt No. : \_\_\_\_\_

Date: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_      Fee Paid: \_\_\_\_\_



# APPENDIX C

## TREE MANAGEMENT TEAM

### DEVELOPMENT APPLICATION FOR TREE WORKS

#### Section 79C Environmental Planning & Assessment Act, 1979

**This form must be used when applying for Development Consent to prune/remove any tree located within a heritage conservation area, on land identified as containing a heritage item or listed on Council's Significant Tree Register.**

<b>Type of Development Consent required -</b>		<b>Tick</b>	<input type="checkbox"/>	<b>As applicable</b>
<input type="checkbox"/> Tree Removal Only	<input type="checkbox"/> Tree Pruning Only			<input type="checkbox"/> Tree Removal and Pruning
<b>Number of Trees applied for -</b>		<b>Tick</b>	<input type="checkbox"/>	<b>As applicable*</b>
<input type="checkbox"/> 1 tree	<input type="checkbox"/> 2 to 4 trees			<input type="checkbox"/> 5 to 9 trees
<input type="checkbox"/> 10 to 15 trees	<input type="checkbox"/> 16 to 20 trees			<input type="checkbox"/> 21 to 25 trees
<input type="checkbox"/> 26 to 30 trees	<input type="checkbox"/> 31 to 35 trees			<input type="checkbox"/> Over 35 trees

**Applicant and Site Details**

Title Mr  Mrs  Miss  Ms  Other .....

Family Name (or Company): .....

Given Name (or contact person): .....

Postal Address: .....

Address where tree/s are located: .....

Phone (H): ..... (W): ..... (Mob): .....

Fax: ..... Email: .....

Signature of Applicant: .....

Name of Property Owner/s: ..... Signature of Property Owner/s: .....

(Property owner's consent is required only if applicant is **not** the owner)

I/We own the subject land, consent to this application and to Council's officers entering the premises during normal office hours for the purpose of conducting inspections relative to this application. **Note:** In the case of an Owners' Corporation, this represents the Secretary (or authorised delegate), or if Crown land, written authorisation of the relevant statutory authority.

**Adjoining Property Owner's consent – if tree is on neighbouring property (pruning only)**

In addition to Council's consent, your neighbour's consent is required where overhanging branches need to be pruned back beyond your property boundary.

Name: .....

Address where tree/s are located: .....

Phone (H): ..... (W): ..... (Mob): .....

Signature of Property Owner: .....

I/We own the subject land, consent to this application and to Council's officers entering the premises during normal office hours for the purpose of conducting inspections relative to this application. **Note:** In the case of an Owners' Corporation, this represents the Secretary (or authorised delegate), or if Crown land, written authorisation of the relevant statutory authority.

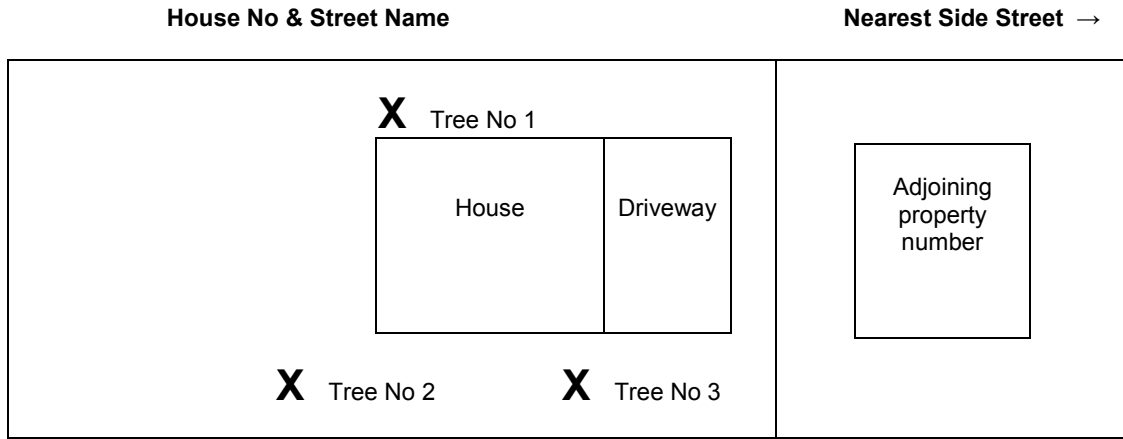
<p><b>Property Details</b> (please circle)</p> <p>Does Council require your presence for access to the site?  <span style="margin-left: 100px;">Yes</span> <span style="margin-left: 50px;">No</span></p> <p>Is an appointment required?  <span style="margin-left: 100px;">Yes</span> <span style="margin-left: 50px;">No</span></p> <p>Is there a dog on the property?  <span style="margin-left: 100px;">Yes</span> <span style="margin-left: 50px;">No</span></p>	<p><b>Previous Applications</b> (please circle)</p> <p>Has a previous application been submitted for these tree/s?  <span style="margin-left: 100px;">Yes</span> <span style="margin-left: 50px;">No</span></p> <p>If yes, was it part of –  <input type="checkbox"/> A Development Application  <input type="checkbox"/> Tree Removal/Pruning permit application</p> <p>Was the application –  <input type="checkbox"/> Approved  <input type="checkbox"/> Refused</p>
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\* An Arborist's report is required if the number of trees requested for removal/pruning is more than ten (10). Report must show location, species, size and condition of each tree. Council officers may also specifically request an Arborist's report - depending upon their assessment of the significance of the subject tree/s.

**NOTES FOR COMPLETING THIS FORM**

You are required to provide a site plan in the space provided below (as per the Block Plan example provided), showing tree/s to be removed/pruned, with each tree numbered together with a description of the species and size of tree/s.

Applications must include reasons as to why the requested tree works are necessary or desired and these must be detailed in the 'Reasons for Pruning/Removal' section below. Additional information and/or supporting documentation such as structural engineer's report/s, pest report/s and any arborist/tree surgeon's report must be attached to this application.



**BLOCK PLAN EXAMPLE (ABOVE)**

**BLOCK PLAN**  
 (Provide sufficient details to locate tree/s – label tree/s numerically as per example above)

**Reasons for Pruning/Removal – List tree/s numerically**

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....
7. ....
8. ....

**DETAILS OF TREE/S ON SITE – to be completed by applicant**

1. Is there any visual evidence that tree/s are unhealthy or structurally unsound? (Please circle) **Yes No**
- 
2. Is there visual evidence of structural damage to property or infrastructure? **Yes No**
- 
3. Are the tree/s prominent because of height, age, size or position? **Yes No**
- 
4. Will removal of tree/s adversely affect soil stability/land degradation? **Yes No**
- 
5. Will removal of tree/s seriously diminish scenic/environmental amenity? **Yes No**
- 
6. Will removal of tree/s adversely impact on vegetation systems/wildlife habitat? **Yes No**
- 
7. Can the tree/s be specifically categorised using any/all of the following criteria? (Please tick where applicable)\*

- Remnant vegetation
- Important landmark specimen
- Historic garden
- Outstanding example of species
- Rare or localised species
- Particularly old or venerable specimen
- Outstanding height, trunk circumference, canopy spread
- Curious/abnormal/unusual growth form
- Commemorating particular event/occasion
- Planted by famous person
- Indigenous/cultural association

\* Council may request property owners/managers to provide a Heritage Impact Statement/Report where significant tree/s are nominated for removal or significant pruning.

**HOW TO LODGE THIS APPLICATION**

**Address this application to:**  
 The General Manager  
 Randwick City Council

and send it to us by any of the following methods -

**Courier or personal delivery:**  
 Customer Service Centre  
 30 Frances Street  
 RANDWICK NSW 2031

**Post:**  
 30 Frances Street  
 RANDWICK NSW 2031

**Office Hours:**  
 8.30am to 5.00pm  
 Monday to Friday

**Email:** [general.manager@randwick.nsw.gov.au](mailto:general.manager@randwick.nsw.gov.au)

**Website:** [www.randwick.nsw.gov.au](http://www.randwick.nsw.gov.au)

**Payment Methods**  
 Pay by cash, cheque, Bankcard, Mastercard, Visa and EFTPOS. Make cheques payable to Randwick City Council. Do not send cash in the mail.

**Acknowledgement**  
 We will acknowledge that we have received your application. You will receive a receipt specifying the amount of fees paid and the registered number of the application.

**Coming in to see us?**  
 Our Customer Service Centre is located on the ground floor of the Randwick City Council Administration building, 30 Frances Street, Randwick.

**Please Note:**  
**If you post your application, please ensure that all the necessary information identified in the Development Application for Tree Works form has been included. If your application is incomplete, it will not be accepted and will be returned to you with your cheque/money order.**

OFFICE USE ONLY	
Application fee received:	\$ .....
Receipt No:	.....
Date:	...../...../.....

## APPENDIX D

### LEGISLATION, PLANNING INSTRUMENTS AND COUNCIL DOCUMENTS APPLYING TO TREE REMOVAL/PRUNING

Applications for tree pruning and/or removal will need to comply with the provisions of a range of legislation, planning instruments and Council policies and documents including, but not limited to, the following: -

- *National Parks and Wildlife Act 1974* - fauna, fauna habitat, protected plants
- *Threatened Species Conservation Act 1995* – State legislation covering ecological communities, critical habitat, endangered and vulnerable species, key threatening processes, recovery plans
- *Environmental Protection and Biodiversity Conservation Act 1999* – Commonwealth legislation covering ecological communities, critical habitat, endangered and vulnerable species, key threatening processes, recovery plans
- *Environmental Planning and Assessment Act 1979* – State legislation which works in conjunction with the *Threatened Species Conservation Act 1995* and the *National Parks and Wildlife Act 1974* in relation to endangered or threatened organisms
- *Native Vegetation Act 2003* - clearing native vegetation, regional vegetation management plans, property agreements
- *Rural Fires Act 1997* - authorised removal of fire hazards
- *New South Wales Heritage Act 1977* (Sections 129A and 139) - sites under conservation orders, relics
- *Noxious Weeds Act 1993* – clearing/removal of noxious weeds
- *State Environmental Planning Policy (SEPP) No 19 – Bushland in Urban Areas*
- Randwick Local Environmental Plan (RLEP) 1998
- Randwick Development Control Plan (RDCP)
- Randwick Tree Preservation Order 2005 – [www.randwick.nsw.gov.au](http://www.randwick.nsw.gov.au) / Council Services / Greening Our City / Trees / Tree Preservation Order
- Randwick Street Tree Masterplan – [www.randwick.nsw.gov.au](http://www.randwick.nsw.gov.au) / Council Services / Greening Our City / Trees / Street Tree Masterplan
- Street Tree Identification Manual – [www.randwick.nsw.gov.au](http://www.randwick.nsw.gov.au) / Council Services / Greening Our City / Trees / Street Tree Identification Manual
- Register of Significant Trees – [www.randwick.nsw.gov.au](http://www.randwick.nsw.gov.au) / Council Services / Greening Our City / Trees / Significant Tree Register



## APPENDIX E

### AUSTRALIAN STANDARD – AS 4373 - 2007 - PRUNING OF AMENITY TREES

Committees of experts from industry, government, consumers and other relevant stakeholders prepare Australian Standards. The requirements and recommendations contained in any published Standard reflect the latest scientific and industry knowledge and expertise.

Australian Standards are continually reviewed after their publication and are regularly updated to reflect changing technology and improved industry standards. For further information on *AS 4373 – 2007 – Pruning of Amenity Trees* or to purchase a copy of that document, log onto [www.standards.org.au](http://www.standards.org.au)

The objective of *AS 4373 – 2007 – Pruning of Amenity Trees* is to provide arborists, tree workers, government departments, property owners and contractors with a guide that defines uniform tree pruning procedures and practices in order to minimise any adverse or negative impacts that pruning may have on trees.

The Standard promotes practices that reduce the risk of hazard development, branch failure, disease infection and premature tree death. Procedures recommended in the Standard are guided by the theories of branch attachment and compartmentalisation of wounds and decay in trees. Discredited practices such as lopping, topping and flush cutting are unacceptable and are excluded from the Standard.

Although guidelines on root pruning are not included in the document, a general outline of the practice is included.

There are three procedures detailed in *AS 4373 – 2007 - Pruning of Amenity Trees* from which a property owner is exempt from having to receive a permit or consent from Council to undertake. These are formative pruning of young trees, deadwooding and powerline clearance.

A brief outline of these practices is detailed below but a comprehensive description of all three pruning techniques is contained within *AS 4373 – 2007 - Pruning of Amenity Trees*.

- **Formative pruning of young and developing trees**

This involves the removal of selected branches on trees less than six (6) metres in height and/or four (4) metres in canopy width to enhance the form and structure of a tree.

- **Deadwooding**

Deadwooding involves the removal of any dead branches within the canopy of a tree. The removal of ALL dead branches larger than 50mm in diameter from within the canopy of any tree is strongly recommended by Council.

- **Powerline Clearance**

This pruning involves the removal of tree branches from around overhead powerlines and domestic service wires to maintain statutory clearances.

The clearance required for service wires is half a metre (500mm) all round. Property owners should refer to EnergyAustralia for statutory powerline clearance requirements but are strongly advised never to undertake any such works themselves.

**Pruning branches away from overhead powerlines and service wires should only ever be undertaken by fully qualified professionals.**

## APPENDIX F

### RECOMMENDED SPECIES LIST - CHARACTERISTICS SUMMARY

Species	Mature Dimensions (metres)	Native/ Exotic	Evergreen/ Deciduous	Potential Root Problems	Fruit/Leaf Drop Severity	Typical Lifespan (years)
<i>Acmena smithii</i> (Lilly Pilly)	10m x 5m	Native	Evergreen	Minor	Severe	70+
<i>Agonis flexuosa</i> (Willow Myrtle)	6m x 5m	Native	Evergreen	Minor	Minor	40-70
<i>Albizia julibrissin</i> (Silk Tree)	5m x 4m	Exotic	Deciduous	Minor	Minor	40-70
<i>Angophora costata</i> (Sydney Red Gum)	18m x 9m	Native	Evergreen	Moderate	Minor	70+
<i>Angophora hispida</i> (Dwarf Apple Gum)	4m x 3m	Native	Evergreen	Minor	Minor	40-70
<i>Araucaria heterophylla</i> (Norfolk Island Pine)	25m x 10m	Native	Evergreen	Moderate	Minor	70+
<i>Backhousia citriodora</i> (Sweet Verbena Tree)	10m x 4m	Native	Evergreen	Minor	Minor	40-70
<i>Banksia aemula</i> (Wallum Banksia)	4m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Banksia ericifolia</i> (Heath Banksia)	3m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Banksia integrifolia</i> (Coastal Banksia)	9m x 6m	Native	Evergreen	Moderate	Minor	70+
<i>Banksia marginata</i> (Silver Banksia)	2m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Banksia robur</i> (Swamp Banksia)	2m x 1m	Native	Evergreen	Minor	Minor	<40
<i>Banksia serrata</i> (Old Man Banksia)	7m x 4m	Native	Evergreen	Minor	Minor	40-70
<i>Banksia spinulosa</i> (Hairpin Banksia)	2m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Bauhinia x blakeana</i> (Orchid Tree)	6m x 5m	Exotic	Evergreen	Moderate	Moderate	40-70
<i>Brachychiton acerifolius</i> (Illawarra Flame Tree)	10m x 5m	Native	Deciduous	Minor	Minor	70+
<i>Brachychiton discolor</i> (Lacebark)	10m x 6m	Native	Deciduous	Minor	Minor	70+
<i>Brachychiton populneus</i> (Kurrajong)	10m x 6m	Native	Evergreen	Minor	Minor	70+
<i>Buckinghamia celsissima</i> (Ivory Curl Flower)	5m x 3m	Native	Evergreen	Minor	Moderate	40-70
<i>Callicoma serratifolia</i> (Black Wattle)	10m x 4m	Native	Evergreen	Minor	Moderate	40-70
<i>Callistemon citrinus</i> (Crimson Bottlebrush)	4m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Callistemon Harkness</i> (Harkness Bottlebrush)	6m x 4m	Native	Evergreen	Minor	Minor	<40
<i>Callistemon 'Kings Park Special'</i> (KPS Bottlebrush)	5m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Callistemon pearsonii</i> (Pearson's Bottlebrush)	2m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Callistemon pinifolius</i> (Green Bottlebrush)	2m x 1.5m	Native	Evergreen	Minor	Minor	<40
<i>Callistemon salignus</i> (White Bottlebrush)	6m x 4m	Native	Evergreen	Moderate	Minor	40-70
<i>Callistemon viminalis</i> (Weeping Bottlebrush)	8m x 5m	Native	Evergreen	Moderate	Minor	40-70
<i>Calodendron capense</i> (Cape Chestnut)	8m x 6m	Exotic	Evergreen	Moderate	Moderate	70+
<i>Ceratonia siliqua</i> (Carob Tree)	7m x 5m	Exotic	Evergreen	Moderate	Moderate	70+
<i>Ceratopetalum apetalum</i> (Coachwood)	10m x 5m	Native	Evergreen	Minor	Moderate	70+
<i>Corymbia citriodora</i> (Lemon-scented Gum)	20m x 10m	Native	Evergreen	Moderate	Minor	70+
<i>Corymbia eximia</i> (Yellow Bloodwood)	10m x 5m	Native	Evergreen	Minor	Minor	40-70
<i>Corymbia ficifolia</i> (WA Flowering Gum)	6m x 4m	Native	Evergreen	Minor	Minor	40-70
<i>Corymbia gummifera</i> (Red Bloodwood)	9m x 6m	Native	Evergreen	Minor	Minor	70+
<i>Corymbia maculata</i> (Spotted Gum)	20m x 10m	Native	Evergreen	Moderate	Moderate	70+
<i>Cupaniopsis anacardioides</i> (Tuckeroo)	6m x 5m	Native	Evergreen	Moderate	Minor	40-70
<i>Decussocarpus falcatus</i> (Yellow Wood)	12m x 7m	Exotic	Evergreen	Severe	Severe	70+
<i>Delonix regia</i> (Royal Poinciana)	8m x 7m	Exotic	Deciduous	Moderate	Moderate	40-70
<i>Elaeocarpus reticulatus</i> (Blueberry Ash)	7m x 4m	Native	Evergreen	Minor	Moderate	40-70
<i>Eucalyptus botryoides</i> (Bangalay)	20m x 9m	Native	Evergreen	Moderate	Minor	70+
<i>Eucalyptus cinerea</i> (Argyle Apple)	8m x 6m	Native	Evergreen	Moderate	Minor	40-70
<i>Eucalyptus globoidea</i> (White Stringybark)	10m x 6m	Native	Evergreen	Moderate	Minor	40-70
<i>Eucalyptus haemastoma</i> (Scribbly Gum)	8m x 6m	Native	Evergreen	Minor	Minor	70+
<i>Eucalyptus leucoxydon</i> (Yellow Gum)	8m x 5m	Native	Evergreen	Minor	Minor	40-70
<i>Eucalyptus luehmanniana</i> (Yellow Top Mallee Ash)	4m x 3m	Native	Evergreen	Minor	Minor	40-70
<i>Eucalyptus mannifera</i> (Red Spotted Gum)	10m x 6m	Native	Evergreen	Minor	Minor	70+
<i>Eucalyptus obtusiflora</i> (Port Jackson Mallee)	3m x 2m	Native	Evergreen	Minor	Minor	40-70
<i>Eucalyptus piperita</i> (Sydney Peppermint Gum)	9m x 5m	Native	Evergreen	Minor	Minor	70+
<i>Eucalyptus punctata</i> (Grey Gum)	12m x 7m	Native	Evergreen	Moderate	Moderate	70+
<i>Eucalyptus robusta</i> (Swamp Mahogany)	18m x 10m	Native	Evergreen	Severe	Moderate	70+
<i>Eucalyptus sideroxydon</i> (Mugga Mugga Ironbark)	15m x 8m	Native	Evergreen	Moderate	Moderate	70+
<i>Eucalyptus sieberi</i> (Silvertop Ash)	9m x 5m	Native	Evergreen	Moderate	Moderate	70+
<i>Eucalyptus squamosa</i> (Scaly Bark Gum)	9m x 5m	Native	Evergreen	Minor	Minor	40-70
<i>Feijoa sellowiana</i> (Fruit Salad Tree)	4m x 3m	Exotic	Evergreen	Minor	Moderate	40-70

## RECOMMENDED SPECIES LIST - CHARACTERISTICS SUMMARY

Species	Mature Dimensions (metres)	Native/ Exotic	Evergreen/ Deciduous	Potential Root Problems	Fruit/Leaf Drop Severity	Typical Lifespan (years)
<i>Ficus macrophylla</i> (Moreton Bay fig)	20m x 25m	Native	Evergreen	Severe	Excessive	70+
<i>Ficus rubiginosa</i> (Port Jackson fig)	18m x 14m	Native	Evergreen	Severe	Excessive	70+
<i>Ficus superba</i> var. <i>henneana</i> (Deciduous Fig)	10m x 8m	Native	Deciduous	Severe	Excessive	70+
<i>Flindersia australis</i> (Australian Teak)	12m x 5m	Native	Evergreen	Moderate	Minor	70+
<i>Fraxinus griffithii</i> (Evergreen Ash)	6m x 4m	Exotic	Evergreen	Minor	Minor	40-70
<i>Geijera parviflora</i> (Wilga)	6m x 4m	Native	Evergreen	Minor	Minor	40-70
<i>Gleditsia triacanthos</i> 'Sunburst' (Honey Locust)	8m x 6m	Exotic	Deciduous	Minor	Minor	40-70
<i>Glochidion ferdinandi</i> (Cheese Tree)	10m x 6m	Native	Evergreen	Moderate	Moderate	40-70
<i>Grevillea banksii</i> (Banks's Grevillea)	4m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Grevillea</i> 'Honey Gem' (Honey Gem Grevillea)	3m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Grevillea linearifolia</i> (Spider Grevillea)	2m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Grevillea</i> 'Misty Pink' (Misty Pink Grevillea)	3m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Harpulia pendula</i> (Tulipwood)	10m x 6m	Native	Evergreen	Minor	Minor	40-70
<i>Hibiscus tileaceus</i> 'Rubra' (Red-leafed Hibiscus)	5m x 4m	Native	Evergreen	Moderate	Moderate	40-70
<i>Hibiscus tileaceus</i> (Cottonwood)	7m x 5m	Native	Evergreen	Moderate	Moderate	40-70
<i>Hymenoporum flavum</i> (Native Frangipani)	6m x 3m	Native	Evergreen	Minor	Minor	40-70
<i>Jacaranda mimosifolia</i> (Jacaranda)	10m x 8m	Exotic	Deciduous	Moderate	Moderate	70+
<i>Koelreutaria paniculata</i> (Golden Rain Tree)	7m x 5m	Exotic	Deciduous	Moderate	Moderate	40-70
<i>Lagerstroemia indica</i> (Crepe Myrtle)	5m x 4m	Exotic	Deciduous	Minor	Minor	40-70
<i>Leptospermum flavescens</i> (Tantoon)	2m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Leptospermum laevigatum</i> (Coastal Tea Tree)	3m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Leptospermum petersonii</i> (Lemon-scented Tea Tree)	4m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Leptospermum squarrosus</i> (Pink Tea Tree)	2m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Leptospermum trinervium</i> (Flaky Barked Tea Tree)	3m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Livistona australis</i> (Cabbage Tree Palm)	20m x 3m	Native	Evergreen	Minor	Moderate	70+
<i>Lophostemon confertus</i> (Brushbox)	10m x 6m	Native	Evergreen	Moderate	Moderate	70+
<i>Magnolia grandiflora</i> (Bull Bay Magnolia)	10m x 7m	Exotic	Evergreen	Moderate	Moderate	70+
<i>Melaleuca armillaris</i> (Bracelet Honey Myrtle)	5m x 4m	Native	Evergreen	Minor	Minor	<40
<i>Melaleuca decora</i> (White Cloud Tree)	8m x 4m	Native	Evergreen	Moderate	Minor	40-70
<i>Melaleuca ericifolia</i> (Swamp Paperbark)	5m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Melaleuca hypericifolia</i> (Red Flowering Paperbark)	2m x 2m	Native	Evergreen	Minor	Minor	<40
<i>Melaleuca linariifolia</i> (Snow-in-Summer)	6m x 4m	Native	Evergreen	Moderate	Minor	40-70
<i>Melaleuca styphelioides</i> (Prickly Paperbark)	6m x 4m	Native	Evergreen	Moderate	Minor	40-70
<i>Metrosideros</i> 'Thomasii' (New Zealand Xmas Tree)	7m x 4m	Native	Evergreen	Moderate	Moderate	40-70
<i>Michelia champaca</i> (Golden Champa)	8m x 4m	Exotic	Evergreen	Moderate	Moderate	70+
<i>Myoporum acuminatum</i> (Western Boobialla)	4m x 3m	Native	Evergreen	Minor	Minor	<40
<i>Nyssa sylvatica</i> (Tupelo)	8m x 5m	Exotic	Deciduous	Moderate	Moderate	40-70
<i>Olea europaea</i> var. <i>communis</i> (European Olive)	5m x 3m	Exotic	Evergreen	Moderate	Moderate	70+
<i>Pistacia chinensis</i> (Chinese Pistachio)	6m x 3m	Exotic	Deciduous	Minor	Minor	40-70
<i>Pittosporum rhombifolium</i> (Qld Pittosporum)	8m x 3m	Native	Evergreen	Minor	Minor	40-70
<i>Platanus x hybrida</i> (London Plane)	20m x 15m	Exotic	Deciduous	Severe	Severe	70+
<i>Polyscias elegans</i> (Silver Basswood)	10m x 5m	Native	Evergreen	Moderate	Moderate	70+
<i>Pyrus calleryana</i> (Callery Pear)	6m x 4m	Exotic	Deciduous	Moderate	Moderate	40-70
<i>Sapium sebiferum</i> (Chinese Tallowwood)	8m x 5m	Exotic	Deciduous	Severe	Moderate	40-70
<i>Schinus areira</i> (Peppercorn)	10m x 8m	Exotic	Evergreen	Moderate	Minor	70+
<i>Stenocarpus sinuatus</i> (Qld Firewheel Tree)	8m x 3m	Native	Evergreen	Minor	Minor	40-70
<i>Synoum glandulosum</i> (Scented Rosewood)	8m x 4m	Native	Evergreen	Minor	Minor	40-70
<i>Syzygium australe</i> (Scrub Cherry)	10m x 6m	Native	Evergreen	Moderate	Moderate	40-70
<i>Syzygium luehmannii</i> (Small-leafed Lilly Pilly)	8m x 4m	Native	Evergreen	Moderate	Moderate	40-70
<i>Syzygium paniculatum</i> (Brush Cherry)	10m x 5m	Native	Evergreen	Moderate	Moderate	40-70
<i>Tibouchina granulosa</i> (Purple Glory Bush)	5m x 3m	Exotic	Evergreen	Minor	Minor	<40
<i>Tristaniaopsis laurina</i> (Water Gum)	8m x 5m	Native	Evergreen	Moderate	Minor	40-70
<i>Ulmus parvifolia</i> (Chinese Elm)	12m x 8m	Exotic	Deciduous	Moderate	Moderate	70+
<i>Waterhousia floribunda</i> (Weeping Lilly Pilly)	10m x 6m	Native	Evergreen	Moderate	Moderate	40-70
<i>Westringia fruticosa</i> (Coastal Rosemary)	1.5m x 1.5m	Native	Evergreen	Minor	Minor	<40

## APPENDIX G

### TREE PROTECTION PLAN

A Tree Protection Plan details the measures that are to be put into place to protect designated trees from injury and damage during development and construction works. A designated tree is a tree on a development site, adjacent land or public land which is required to be retained and protected as a condition of development consent.

#### Requirements for Tree Protection Plans

In order for Council to be able to adequately assess the appropriateness or otherwise of proposed tree protection measures involving protected trees on both development sites and adjacent private property and/or public land, a Tree Protection Plan providing the following information must be submitted to Council:

- A site plan (to scale) accurately showing:
  - i) location of tree/s on the subject site and any adjoining trees which may be affected by any development. Trees identified on the plan should be numbered;
  - ii) all trees which are to be removed and their details;
  - iii) all trees to be retained (protected trees) specifying tree number, species, common name, height, canopy width, DBH, general condition;
  - iv) optimum and minimum tree protection zones;
  - v) location and description of tree protection measures to be installed;
  - vi) lot boundaries, dimensions and North point;
  - vii) proposed development including services, driveways, and any alteration to existing soil levels and drainage.
- Detailed calculation of the Structural Root Zone (SRZ) and Tree Protection Zone (TPZ) radiuses of any protected tree/s.

Tree Protection Zones are areas specifically set aside to ensure that retained trees are adequately protected during development and construction activities. This zone must comprise an area sufficiently large enough to protect a designated tree or trees and their roots from disturbance or damage.

The TPZ for any tree should wherever possible extend to at least the dripline of any protected tree. Where this is not possible the zone should extend as far as possible in all directions from the trunk of the tree.

Generally, the TPZ radius should be calculated by multiplying the subject tree/s diameter at breast height (DBH) by a factor of twelve.

The Structural Root Zone of any particular tree/s is the minimum area required to ensure the stability and long-term viability of the tree/s.

The calculation of the SRZ and TPZ radiuses of protected trees must comply with the procedures and calculation methodologies detailed in Section 3 of Australian Standard AS 4970 – 2009 – *Protection of Trees on Development Sites*.

- A tree management plan detailing measures to ensure the health and stability of protected trees, including any proposed canopy or root pruning, excavation works, site controls on waste disposal, vehicular access, storage of materials and installation of utilities.

As a general rule, however, no excavation works should be undertaken within the following recommended radial distances from protected Council-owned trees on public land.

<b>Trunk Diameter @ DBH</b>	<b>Restricted Radial Distance</b>
Less than 200mm	2 metres
Between 200mm – 400mm	3 metres
Greater than 400mm	4 metres

NOTE: The property owner, construction supervisor and project arborist are required to meet with Council's landscape development officer on-site prior to the commencement of any development/ construction works to discuss procedures, review any proposed tree protection plan, assess tree protection measures and to ensure that the installation of tree protection zones has been complied with.

## APPENDIX H

### DRAFT AUSTRALIAN STANDARD – DR 99307 – *Amenity Trees – Guide to Valuation*

This draft Standard provides a framework for calculating the monetary value that can be attributed to any tree within the landscape. It utilises a number of factors that are relevant in determining the amenity that a tree provides to the community and its horticultural importance in the surrounding environment.

These factors include the size of the tree, its useful life expectancy, importance in the landscape, presence of other trees, relation to the setting, form and any special factors that may be relevant to any particular tree.

The special factors considered include a tree's historical associations, botanic rarity, exceptional landscape value, etc. A special factors rating is particularly important when assessing the amenity value of any tree/s listed within Council's Register of Significant Trees.

Incorporated into each amenity valuation is a pre-determined \$AUS increment value, which in the case of valuations for trees within the Randwick LGA is \$50 – as recommended in *DR 99307 – Amenity Trees – Guide to Valuation*.

For each of the applicable assessment factors a tree is given a score of between one and four and the assigned points for each factor are then multiplied together to give a total. This total is then multiplied by the pre-determined increment value to give the actual amenity value of the tree in \$AUS.

The table below details the factors incorporated into a tree's amenity valuation as well as a brief rating correlating to the points that can be allocated to each tree.

#### TREE VALUATION FACTORS

Factor	Points			
	1	2	3	4
1. Size of Tree	Small	Medium	Large	Very Large
2. Useful Life Expectancy	10-20 years	20-40 years	40-100 years	100+ years
3. Importance in landscape	Little	Some	Considerable	Great
4. Presence of other Trees	Many	Some	Few	None
5. Relation to Setting	Barely Suitable	Fairly Suitable	Very Suitable	Esp. Suitable
6. Form	Poor	Fair	Good	Esp. Good
7. Special factors	None	One	Two	Three

**Total score = 1 x 2 x 3 x 4 x 5 x 6 x 7 x \$50AUS**

This valuation method only takes into account the amenity value of the tree and does not incorporate any costs associated with the removal and/or replacement of any such tree.

