Guidelines

Tree Management Guidelines for Council Managed Land
Version 1.2

Adopted by Executive Management Team at its meeting on 2 June 2010

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1. INTRODUCTION

1.1 Objectives

Good planning, species selection and appropriate maintenance are vital for safe and manageable street, roadside and other trees that will provide aesthetic, physical, environmental and ecological benefits to the community.

It is Council's role to manage these trees in a safe, effective and efficient manner to provide maximum aesthetic, physical and psychological benefits to the community. Modern arboriculture is a new and evolving science that is poorly understood by most people. This often results in unrealistic expectations with regard to tree management.

The combination of poor general understanding of modern arboriculture and the emotional entanglements that come with large, long living things such as trees can result in emotive situations. Council's objective is to provide reasonable and consistent guidelines to defuse these situations. Accordingly, this protocol provides a framework for the management and maintenance of the Shire’s street roadside and other trees that will deliver positive outcomes in a fair and consistent manner for our community.

Council currently has a number of policy and planning instruments that provide for various elements in regards to the management of trees. This protocol will bring these elements together into the one document and compliment them with additional information to provide a coherent guide to how Council will manage its tree populations.

1.2 Scope

The tree management plan is only applicable to land that council directly controls and does not apply to other reserves or private property.

In the case of roads controlled by The Roads and Traffic Authority (Pacific Highway from Yelgun to Chinderah and from South Tweed to the Queensland border) Council has no responsibility for the control or management of the roadside vegetation (including trees) adjacent to these roads.

In the case of Holiday Parks under the control of the Tweed Coast Holiday Parks Reserves Trust, tree management is undertaken as a component of the Holiday Parks risk management program.

1.3 Statement of Environmental Significance, Value and Amenity to the Community

Trees are environmentally and aesthetically significant community assets. This is particularly so with street trees which are widely recognised for their aesthetic value and contribution to the community's pleasure, comfort and well being.

Trees play a major role in defining the character of the shire, and they provide shade and reduce solar radiation and assist in noise reduction and air purification. The cost in dollar
terms of establishing a tree, and its continued management and maintenance over its lifetime, which can equal and is often greater than a human life span, is very considerable.

Quantifiable benefits of trees are summarised below:

- Temperature and Energy Use
- Shade
- Wind Control
- Active Evaporation
- Air quality
- Oxygen Production
- Pollution Reduction
- Carbon Dioxide Reduction
- Hydrology
- Water Run-Off
- Water Quality / Erosion
- Noise Abatement
- Glare Reduction
- Animal Habitats
- Economic / Social / Psychological Benefits
- Economic Stability
- Property Values
- Product Production
- Aesthetic Preferences
- Visual Screening
2 MANAGEMENT

Trees have a finite life. Their genetic potential and external factors impact on them and determine how well they perform. In the case of street trees, the growing conditions are usually significantly altered from those encountered in their natural growing environment, resulting in the need for clear knowledgeable tree management.

Street trees grow amongst people and property and as such pose management challenges as a result of community expectations for amenity, functionality and safety. The impact of altered growing environments and community demands of trees requires intensive best practice management for trees within our urban environments.

2.1 Areas of Responsibility

Council is responsible for the design, plant selection, planting, removal, maintenance and record keeping of trees in all road reserves, parks and recreational reserves within Tweed Shire with the following exceptions –


2. Roads controlled by The Roads and Traffic Authority. These are the Pacific Highway from Yelgun to Chinderah and from South Tweed to the Queensland border.

These guidelines apply to, and deal with the day-to-day management activities undertaken by the various units of Council as outlined below:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Area of responsibility</th>
</tr>
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</table>
| Recreation Services               | • All trees in Council managed parks and reserves excluding bushland areas under the management of the Natural Resources Unit.  
                              | • Street trees in urban areas of shire.                                                 |
| Works Unit                        | • Street trees in rural areas                                                          |
| Business and Economic Development | • Holiday Parks and tourist information centres and Murwillumbah Cattle and saleyards. |
| Water Unit                        | • Water catchment areas, sewer pump stations and water treatment plants                |
| Natural Resources Unit            | • Bushland, foreshore, riparian and other natural areas or areas managed for their ecological values. |
3 TREE INSPECTIONS

3.1 Tree Inspection & Authorised Persons

a) No routine inspection of any tree shall be carried out;

b) When a tree is required to be inspected, the inspection shall only be undertaken by a declared 'authorised person', as determined by a responsible person;

c) Subject to d), when a tree is inspected, it will only be inspected for visually obvious defects;

d) A detailed technical inspection of a tree will only be undertaken if, and only if, a visual inspection reveals the need to do so;

e) Declared authorised persons. In determining an ‘authorised person’ a responsible person shall have regard to the level and standard of:

- experience;
- skill;
- competence; and
- education;

required to be possessed by an ‘authorised person’ to enable that person to satisfactorily discharge his or her function, powers and duties.

3.2 Tree Inspection—The Discovery of Sick, Injured or Hazardous Trees and Damage or Injury to Persons or Property

a) No routine Inspection of any tree shall be carried out to discover:

i) any tree which is sick, injured or diseased;

ii) any tree which has or may possess the known or suspected propensity to injure persons or to damage any building or structure, road, footpath, cycleway, walking track or trail, sewer, drainage, water, gas, telecommunication or public utility system through: tree root exposure, invasion and infestation; 'sudden branch drop syndrome'; the dropping of leaves, flowers, fruit, gum; or by the existence of poisons, allergens etc.; and

iii) whether or not any injury to persons or damage to property is occurring, has occurred or is likely to occur as either a direct or indirect consequence of:
iv) tree root invasion into, or root damage to, any private dwelling or public building; utility service such as but not limited to water, sewer, gas, telecommunication or electricity services;

v) sick or dying trees or tree root systems, falling limbs, branches, fruit, flowers, seeds, gum, sap, berries etc;

vi) tree root damage to any public road; bridge, culvert or crossing; any stormwater, drainage or floodway system, pipe, gutter or kerb; footpath, pathway, walking trail or track; car park; cycleway; fire trail or emergency access track or road; any paved or unpaved pedestrian surface; any public place; any public reserve; park or nature reserve; any public open space area, any playing field or oval; saleyard; cemetery; shopping centre or mall; any building or structure; any dam, weir, or embankment; and anything forming part of anything whether mentioned in this subsection or not.

b) Subject to c), when a tree inspection is carried out in accordance with this policy the inspection shall be limited to the discovery of visually obvious defects or disease;

c) A technical inspection shall only be carried out if, and only if, a visual inspection reveals the need to do so.

3.3 Record Keeping

All request or notifications regarding tree inspections or any other issues related to trees subject to this protocol will be responded to in accordance with Councils adopted service level standards and recorded against the property and/or person in Councils record management system. Any technical inspections will be completed on the inspection form (appendix 9) and also recorded in Councils record management system.
4 TREE REMOVAL

Removal of trees from nature strips and parks is potentially the greatest cause of conflict in the management of the Shires trees. Understandably, residents can become very attached to a long-lived tree that has been growing near their home for many years. Prudent tree management requires Council to assume that every tree, no matter how insignificant it may appear, has some value to someone.

Unfortunately, it sometimes becomes necessary to remove trees, either because of a problem with the tree itself, it may be causing damage or to facilitate development (buildings and infrastructure). Experience shows that public concerns associated with the removal of trees can be minimised through consultation with residents and a demonstration of respect for the importance of trees by Council work practices.

4.1 The following details Councils policy on tree removals:

a) Subject to 4.1b) and 4.1c), no tree shall be removed by reason only that it is determined to be of a species that has the known or suspected propensity to cause injury to persons or damage to property by tree root exposure, invasion or infestation; or by naturally occurring ‘sudden branch or limb drop syndrome’.

b) Reasons for the removal of a tree shall include it being declared:
   - on inspection; and
   - by an authorised person;
   - to be a danger to human life or property.
   - a weed under the Noxious Weeds Act 1993
   - a recognised environmental weed.

c) Provided always that a tree declared to be a danger to human life or property:
   - shall be removed or made safe at the earliest possible opportunity; and
   - a tree shall not be declared a danger merely because it may naturally drop sap, gum, flowers, fruit, seeds and shed leaves, twigs or branches etc. over which people may slip, trip or fall on or otherwise suffer injury or property damage.

d) For the purpose of c), the terms:

   "made safe" include the erection of safety measures or by rendering a tree safe by pruning.

   "naturally drop" includes the shedding or dropping or excreting of sap, gum, flowers, fruit, seeds, leaves, twigs or branches etc due to seasonal, environmental stresses (eg. drought or excessive wet conditions), adverse weather conditions or disease.
In addition to the clauses discussed previously, Council will not remove or approve removal of a tree or part of a tree on Council managed land:

- that is in good health;
- that has heritage, landscape or environmental value that outweighs associated risk;
- where the removal of part of the tree is considered to be a suitable alternative;
- to enhance views;
- to increase natural light;
- to improve street lighting of private property;
- to reduce animal droppings from being deposited on personal property;
- to address concerns that there is potential for damage to underground services (unless supported by written expert advice and only where reasonable alternatives are not feasible);
- for the reduction of bushfire risk unless it is substantiated to the satisfaction of the Rural Fire Service or Council’s Bushland Officer;
- because of minor lifting of driveways and paths; and
- because of the presence of white ants unless they have caused structural damage with a high associated risk.

### e) Installation of Solar Photo Voltaic (PV) Panels, and/or Solar Hot Water Systems

In regards to situations where an application is lodged requesting removal or pruning of tree(s) for the installation of solar PV panels or solar hot water systems. Council will require an assessment from the installers outlining the extent the tree(s) will overshadow the PV panels, taking into account summer and winter sun elevations.

- Council will then make an assessment of the tree(s) in accordance with criteria detailed above, taking into consideration the health, structure, and significance of the tree(s)
- If the tree(s) are considered to be of local or regional significance to the area by Council’s arborist, an alternative location for the installation of solar panels will need to be investigated.
- If the tree(s) are considered to be healthy and structurally sound but of little significance to the local amenity, and environment, Council will consider the removal or trimming of the tree(s) upon receipt of documentation that the solar panels have been installed.
5 TREE MAINTENANCE

A responsible person shall develop and implement management standards for the maintenance and inspection of trees on all property owned or controlled by Council.

5.1 Lopping/Topping of trees

Lopping or topping of trees is an unacceptable practice that leads to unsafe trees and is contrary to arboricultural practices which is supported by Australian Standard 4373 Pruning of Amenity Trees.

The resultant epicormic growth from lopping or topping is vigorous, generally vertical, weakly attached and dense. The end result is a tree with an unnatural habit that is predisposed to decay and storm damage.

The only exception where lopping may be considered is if a Council qualified and duly authorised officer assesses a hazardous tree as being suitable for long term retention as a habitat tree. This then requires the heavy pruning of the hazardous material back to stable low risk branch stubs and or trunk and if not dead the application of herbicide to prevent inappropriate regrowth.

5.2 Pruning

Council trees will be pruned to the Australian Standard, AS4373, Pruning of Amenity Trees. Council tree pruning will involve only selected tree branches to ultimately achieve a structurally sound and aesthetically shaped tree.

Residents and ratepayers are not authorised to prune or remove trees on streets and reserves.

5.3 Root Pruning

Root pruning is generally to be discouraged, as the long-term results cannot be fully known. Where root pruning is required the following general guidelines will apply –

- Roots with a diameter less than 60 mm shall be cleanly cut with a sharp saw at the discretion of the on-site staff or contractor.
- Roots of a diameter greater than 60 mm shall not be cut unless authorised by the Council Arborist or an authorised representative.
- All root pruning is to be carried out using a sharp saw or specialised root-pruning equipment. Under no circumstances shall roots be ripped or pulled by machines.
- Where roots have been inadvertently damaged during excavation works, the damaged roots must be cut clean as outlined above. Where these roots are in excess of 60mm in
diameter, the Council Arborist must inspect the tree and damaged roots before work continues.

5.4 Termites

Termites are naturally occurring insects in the environment. There are over 350 species of termites in Australia of these around 20 species may cause economic damage to property, not all of these occur in the Tweed Shire area.

Although termites are feared for their potential to damage property they also provide an important role in nature. Termites assist in the breakdown and recycling of organic matter back into our soils and provide food for animals such as birds, lizards and echidnas.

Council is often called upon to inspect trees in public areas which have termite activity present. These trees are inspected in accordance with Section 3 of these guidelines.

Council will not treat termite infestations with chemical or other control measures. It remains the responsibility of property owners to ensure their property is suitably protected against termite infestation. This is done by regular inspections carried out by a licensed pest controller.
6 RISK MANAGEMENT FOR EXISTING TREES

Typical interactions leading to conflict involve trees and powerlines (eg causing fires and loss of power) trees and poles, trees and footpaths (eg tripping points), trees and pipes, repair of footpaths and trees, installation of underground services near trees.

Interactions between trees and structures are complex and there are likely to be other factors contributing to any given situation. It is therefore not beneficial to focus concern entirely onto a tree or tree species when developing a tree risk management strategy.

Factors that commonly contribute to negative interactions between trees and structures include:

- The soil type; its structure and depth;
- The tree species and its genetic disposition;
- The design of the structure;
- The construction materials and methods adopted;
- The age of the structure (as with trees, structures have a ‘useful life span’ and have to be maintained and then replaced within set timeframe); and
- The type of previous land use eg industrial sites where soil contamination and/or layers of fill can impede normal biological processes.

Appendix 1 Risk Management and hazard abatement strategies for existing trees and Appendix 2 Guidelines for excavations and installations near trees and Appendix 3 Guidelines for Management of Trees near Existing Structures provide advice on options for managing risks associated with existing trees.
7 NEW TREE PLANTINGS

Trees are the dominant component in landscapes, and one of the most effective ways of improving the image and landscape character of an area is to upgrade the street tree/roadside and public open space planting.

The introduction of new trees to the Shire’s streets and other Council controlled land can be considered one of the simpler horticultural tasks however, trees create a long term impression in the landscape and can alter the identity of the landscape and impact on management practices and subsequent resource allocation.

It is important to understand in any tree planting program there are a range of public safety and amenity issues that must be considered. Tree location should consider the mature dimensions of the canopy height and width, trunk diameter and root development requirements to ensure that they do not have an eventual impact upon Council or privately owned infrastructure.

7.1 New tree plantings:

a) Subject to c), no tree shall be planted in any road reserve, public place or at any other place which has the known propensity to cause injury to persons or damage to any property by: root exposure, invasion or infestation to buildings and structures; sewer, water, gas, electricity, telecommunication and public utility systems; or ‘sudden branch drop syndrome’.

b) A tree which falls within the category of tree in a) shall not be excluded from being planted in a road reserve, public place or at any other location by reason only that it may:

- drop sap, gum, fruit, seeds and shed leaves and branches etc. which when dropped may reasonably foreseeably cause persons to trip, slip and fall, or be struck by a branch or limb—or cause damage to motor vehicles or to any other property; or
- infest and damage any private or public property or cause injury to any person who owns, occupies, uses, visits or merely crosses such property.

c) Where, for compelling environmental or aesthetic reasons, it is desirable to plant a tree contrary to a):

- a risk assessment, in accordance with the principles in AS 4360:1999—Risk Management, shall be carried out by a responsible person to determine the likely impact of planting the tree in terms of those things mentioned in a); and
- a plan of management, incorporating the risk assessment, shall be developed, implemented and maintained to manage, abate and control the tree so as to eliminate or reduce any risk of injury or damage.
d) For the purpose of a), “known propensity” means a tree species which has been determined by a recognised scientific, academic or professional authoritative published source to be of a species known to cause injury to persons or damage to property.

e) For the purposes of c), “compelling environmental or aesthetic reasons” means that such a planting is, in the opinion of a responsible person, essential to preserve:

- the visual or scientific integrity of an existing shire or rural treescape amenity; or
- to preserve the integrity and/or continuity of a rare or endangered species.

Figure 1 illustrates the species selection process when considering new tree planting.

**FIGURE 1- SPECIES SECTION FLOW CHART**

SELECT TREE SPECIES

Do you know the risk zone and site characteristics? No see Appendix 4

Do you know the social/cultural context? No see Appendix 5

Do you know the species characteristics? No see Appendix 6

Have you considered a risk management strategy? No see Appendix 7

Trees shall be planted in accordance with Council’s tree and shrub planting details and tree planting in pavement details (Appendix 8).
The Shire will give hierarchical preference to the selection of trees on the following basis:

1. Endemic
2. Native
3. Exotic

The highest preference is for the planting of indigenous tree species and this will form the majority of new and replacement plantings where possible. Where indigenous species cannot be used or are inappropriate for the particular environment, preference will be given for Australian native vegetation species to be selected. Consideration will be given to the use of exotic deciduous or evergreen species where these species would enhance the established neighbourhood character and a high level of community support exists.

7.2 Tree Planting by Residents on Council Land

Planting of street trees should be undertaken by Council officers. Street tree plantings may be undertaken as part of a street tree planting program, to replace trees that have been removed for any reason or at the request of the resident.

Planting of street trees by residents can only be undertaken with the cooperation of Council Officers where specific permission has been sought and given by Council. This is to ensure that plantings are appropriate for area and are planted in the Council approved methods to minimise damage to infrastructure and threats to public safety.

Unauthorised planting of street trees by residents shall be discouraged, but recently planted trees will be allowed to remain provided they are:

- of a suitable species and compatible with the surrounding streetscape,
- good quality specimens,
- in a suitable location,
- planted to council standards and specifications.

Where a tree does not meet these conditions, the resident shall be asked to remove the tree. If the resident does not comply, Council staff or Council contractors will remove the tree.
### APPENDIX 1

Risk Management And Hazard Abatement Strategies For Existing Trees

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor trip points</td>
<td>Where no other practical method can be employed to prevent this occurring, a regular trip point inspection program should be instigated and pavement replaced or repaired as necessary.</td>
</tr>
<tr>
<td>Flexible pathways</td>
<td>Use of flexible material such as bitumen, paving, or rubber compounds for footpaths and tree surrounds, will reduce the occurrence of trip points and is less expensive and easier than concrete to maintain or replace when necessary.</td>
</tr>
<tr>
<td>Re-direct pathways</td>
<td>Where space allows, pathways should be re-directed away from trees/tree roots. It may also be beneficial to reduce the newly directed pathway width.</td>
</tr>
<tr>
<td>Bridging Footpaths</td>
<td>Self-supporting construction methods, such as pier and beam could be used to raise pathways above the roots, allowing for root expansion without damaging the pavement. Timber bridges are an effective option.</td>
</tr>
<tr>
<td>Root pruning</td>
<td>Non-structural roots could be pruned on a predetermined basis under the guidance of a qualified arborist. This practice could be combined with installation of root barriers where appropriate.</td>
</tr>
<tr>
<td>Root barriers</td>
<td>Where future problems are perceived, barriers could be installed to deflect roots away from pavement or services.</td>
</tr>
<tr>
<td>Tunnelling for services</td>
<td>Tunnelling (directional boring) rather than open trenching for underground services, will greatly reduce public risk as well reducing injury to tree roots. If located deeply, root contact with the pipeline may be minimised as the majority of roots of most species will remain within the top 1 metre of soil (based on a soil with medium texture).</td>
</tr>
<tr>
<td>PVC welded piping</td>
<td>Replacement of old porous clay pipe mains with PVC or polyurethane mainlines will significantly reduce the potential for tree root entry.</td>
</tr>
<tr>
<td>Raising pathways</td>
<td>Where appropriate, pathways could be raised to reduce direct root pressure on the pavement. Care must be taken not to build up soil against the trunk of a tree. Aeration piping, in conjunction with geotextile fabric and gravel should be installed between root zone and new pavement to aid with gas exchange to roots. Care should be taken to shape the new surface to drain water away from the trunk of the tree.</td>
</tr>
<tr>
<td><strong>Insulated (ABC) cabling</strong></td>
<td>Replacement of uninsulated overhead powerlines with insulated &amp; bundled cables will reduce both the clearance needed and the pruning costs and severity.</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Underground power &amp; communications cables</strong></td>
<td>The initially high cost of installing power underground may in fact be a practical option when compared with the projected cost of repeated pruning, the risk that this work involves to operators, the negative impact on trees, loss of public amenity and of urban forest economic contributions.</td>
</tr>
<tr>
<td><strong>Diverting services</strong></td>
<td>Services could be diverted along roadways, rather than in the nature strip where a valuable stand of trees is present. To make this option more attractive to service providers, Councils may wish to consider waiving road opening fees.</td>
</tr>
<tr>
<td><strong>Diverting kerb/gutter</strong></td>
<td>When possible, kerb/gutter could be diverted around tree roots or further away from the trunk, creating an island around the tree.</td>
</tr>
<tr>
<td><strong>Enlarging root zone</strong></td>
<td>Where space allows, a designated area above the root zone of the tree should be enlarged/created to accommodate surface roots. Rather than turf, this area could be formed into a garden bed, mulched or covered with a suitable tree grate.</td>
</tr>
<tr>
<td><strong>Formative pruning</strong></td>
<td>Early pruning will reduce the development of structural weaknesses in older trees. Refer to AS4373 Pruning of Amenity Trees.</td>
</tr>
<tr>
<td><strong>Remove target</strong></td>
<td>In some situations it is preferable to remove a potential target, such as a seat rather than to remove a tree in order to abate a hazard.</td>
</tr>
<tr>
<td><strong>Remove the defect</strong></td>
<td>This could include pruning of live or dead branches or the removal of co-dominant stems.</td>
</tr>
<tr>
<td><strong>Tree engineering</strong></td>
<td>In some cases cabling may be used to support tree structure or to control the direction of a possible failure. This is highly specialised work.</td>
</tr>
<tr>
<td><strong>Tree removal</strong></td>
<td>In some situations it may be preferable to remove a tree and replace with a more suitable species, perhaps in an alternative location. In all cases of tree removal it is necessary to ensure that the removal is mitigated in order to ensure the future integrity of the urban forest.</td>
</tr>
</tbody>
</table>
APPENDIX 2

Guidelines For Excavations And Installations Near Trees

Trees can suffer damage when physical works are undertaken near them, including bark damage, branch breakage, chemical poisoning and root damage. Where work is to be carried out in the vicinity of a tree, an assessment of the site, job requirements and work procedures must be undertaken to estimate potential damage of the tree.

A work plan shall be developed that actively protects the tree. The tree drip line is defined as a circle centred on the tree trunk with a radius equal to the furthest horizontal point of the tree canopy from the trunk. Council may recover costs and compensation for replacement, loss of amenity value and remedial works from persons or contractors who prune, remove or cause damage to Council trees by failing to comply with the Street Tree Management Policy, contract document conditions, Council Planning Permits and other relevant Council Policies and Guidelines.

Protection of Trunk and Canopy

The trunk and canopy of a tree are highly visible and, in most cases, comprise most of the benefits the tree has to offer to the community. As such, protection of them is extremely important. In particular, damage, including bark damage, to the trunk and major limbs can have serious detrimental consequences for the health, structural integrity and aesthetic value of the tree. All works near trees must be undertaken in a way that prevents tree damage. Where a tree has suffered damage, the tree must be inspected by the Council Arborist or authorised representative before works continue to determine any remedial action that may be required. Costs for such remedial action shall be borne by the person causing the damage.

Excavation/Boring

Where boring is to be used, the following conditions must be met:

- Entry holes must not be within \((1 + 3 \times \text{trunk diameter})\) metres of the tree trunk,
- Boring must be sufficiently deep as to prevent damage to woody roots,
- Works must not cause compaction of the soil in the tree root zone.

Trenching

Open trenching is actively discouraged in the vicinity of Council trees. Trenching will only be permitted where the following conditions are met:

- No mechanical trenching within \((1 + 3 \times \text{trunk diameter})\) metres of the tree trunk. Trenching within this area may be done with hand tools or the use of an air knife, providing no roots greater than 60mm diameter are severed and the tree is not destabilised,
• No trenching is permitted that will sever more than 20% of the tree root system,
• Trenching within the tree drip line to be done radially from the trunk. Transverse trenching is not permitted within the drip line,
• Works must not cause compaction of the soil in the tree root zone,
• Trenches shall be the minimum width required for the installation, where underground infrastructure is to be installed directly beneath the trunk of a Council tree, boring techniques must be used.

Protection of tree root systems is essential for long-term health and mechanical stability of trees. Even minor damage to the root system can lead to catastrophic failure by allowing pathogenic organisms into the tree, causing decay to damage the tree far in excess of the original injury. Such damage may take years before actually leading to death or failure of the tree.

Apart from actual fracture of the root system, roots can be damaged or killed by compaction of the soil. Compaction reduces available air space in the soil and may also lead to water logging. These factors lead to reduced oxygen levels in the soil. If insufficient oxygen is available to the roots, they will die. This damage is difficult to detect, but may be more damaging to the tree than direct damage. Wet soils and soils with high clay content are especially prone to compaction.

Major root system damage will almost always lead to removal of the tree; therefore, prevention of damage is essential. Persons who cause damage to tree root systems of Council trees will be liable for costs and compensation for remedial works and/or removal of the tree and the loss of amenity to the community.

**Prevention of Soil Compaction**

Persons performing works near Council trees will do so in a manner that will prevent compaction of the soil in the tree root zone.

Within the drip line or within three metres of the tree trunk, whichever is greater –

• No vehicle or vehicle-mounted equipment shall be parked, driven or operated,
• No materials shall be unloaded or stored,
• No heavy pedestrian operated equipment is to be stored or operated (e.g. rollers, whackers),
• Where the soil is wet or has significant clay content, all activity including pedestrian activity shall be excluded.

**Use and Storage of Materials**

No materials, chemicals, spoil or debris shall be used, stored or dumped within the drip line of or within three metres of the trunk of a tree, whichever is greater. This includes concrete, lime, bricks, soil, paint and detergents.
Guidelines for Management of Trees near Existing Structures

Trees are significant community assets with economic, environmental and aesthetic value. Mature trees, particularly street trees, have had a significant economic investment in planting, management and maintenance, usually to be counted over decades. As such, their value must be considered in the event of alleged, potential or actual damage to structures. A mature tree has taken many years to grow and usually cannot be moved or replaced if removed, whereas most structures can be repaired, moved or replaced in a relatively short time. When calculated, the economic value of the tree may far exceed that of the structure. The economic loss inherent in a tree must be balanced with the value of the structure.

Council may recover costs and compensation for replacement, loss of amenity value and remedial works from persons or contractors who prune, remove or cause damage to Council trees by failing to comply with the Street Tree Management Policy, contract document conditions and other relevant policies and Guidelines.

Plant roots do not “seek” or “search” for water. They cannot sense water across dry or impermeable material. Tree roots grow by permeating small pores or “gaps” in the soil. The more aerated (loose) the soil, the more readily the roots will grow. Where roots encounter moist soil, they will exploit it; however, they generally cannot grow in waterlogged conditions because they need oxygen to survive.

Above Ground Structures

Road Pavement, Footpaths, Kerb and Channel

As Council is responsible for the maintenance of both the trees and these structures the procedure for dealing with damage to them is relatively simple, as liability for the damage is not an issue.

Council’s response to this type of damage shall be:

1. Damage inspected by a council representative.
2. If repair is required, the damaged section shall be removed and the offending roots exposed.
3. Roots with a diameter less than 60 mm shall be cleanly cut with a sharp saw at the discretion of the on-site maintenance staff or contractor.
4. Roots of a diameter greater than 60 mm shall not be cut unless authorised by the Council Arborist or an authorised representative.
5. If roots which have caused or are likely to cause damage cannot be cut without affecting the stability or health of the tree, options such as re-alignment of the structure and root
barriers shall be considered by the Council Arborist and relevant manager or their representatives. The level of expenditure committed to the redesign shall reflect the condition and significance of the tree.

6. If tree’s are causing substantial damage or are likely to, and no other option is practical, the tree may be removed in accordance with Tweed Shire Council – Guidelines for Tree Removal.

Electric Lines

The clearing of vegetation around power lines is strictly regulated. Work must not be carried out within 3m of Low voltage lines and 6m of High voltage lines (unless authorised).

Fences, Driveways and Other Private Property

All claims for damages against Council trees shall be referred in writing to Council’s Insurance Claims Officer.

Pipes

Damage to pipes by tree roots comes about by either:

1. the invasion of the pipe by roots through a fault in the pipe and subsequent blockage as roots grow within the pipe;
2. mechanical fracture of pipes by pressure as roots grows adjacent to the pipe.

The former is the more common and is a result of poor pipeline construction materials and techniques. Roots cannot enter a pipeline unless there is a pre-existing fault or gap. Roots cannot “drill” into intact pipes, but they can exploit minute gaps around seals and joints.

Private Drains

Maintenance of drains and sewer lines on private property is the responsibility of the householder, and if roots do block drains within private properties, the council may not be liable for any damaged caused.

Council Drains

As Council is responsible for the maintenance of both the trees and these structures the procedure for dealing with damage to them is relatively simple, as liability for the damage is not an issue.
Council’s response to this type of damage shall be:

1. Damage inspected authorised representative.
2. To facilitate repair, roots with a diameter less than 60 mm shall be cleanly cut with a sharp saw at the discretion of the on-site maintenance staff or contractor.

3. Roots of a diameter greater than 60 mm shall not be cut unless authorised by the Council Arborist or an authorised representative.

4. If roots which have caused or are likely to cause damage cannot be cut with pipe clearing equipment or without affecting the stability or health of the tree, options such as realignment of the structure shall be considered by the Council Arborist and Asset Owner or their representatives. The level of expenditure committed to the redesign shall reflect the condition and significance of the tree.

5. If no other option is practical, the tree may be removed in accordance with Councils tree removal practices.

**Private Drains and Sewers**

All claims for damages against Council trees shall be referred to the Governance Administrative Officer
**APPENDIX 4**

Street Tree Planting Risk Zones and Site Characteristics

**Tree planting risk zones in streets**

<table>
<thead>
<tr>
<th></th>
<th>ZONE A</th>
<th>ZONE B</th>
<th>ZONE C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Most constraints</strong></td>
<td>(Greatest risk)</td>
<td>Moderate constraints</td>
<td>Fewest constraints</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Moderate risk)</td>
<td>(Minimum risk)</td>
</tr>
<tr>
<td><strong>Electrical &amp;</strong></td>
<td>uninsulated low and high</td>
<td>bundled cables (ABC)</td>
<td>no powerlines</td>
</tr>
<tr>
<td><strong>telecommunications</strong></td>
<td>voltage wires</td>
<td>insulated cables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bushfires area</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Below ground</strong></td>
<td>fibre optic cables</td>
<td>water mains</td>
<td>no underground services</td>
</tr>
<tr>
<td><strong>services typical</strong></td>
<td>high voltage power</td>
<td>gas mains</td>
<td></td>
</tr>
<tr>
<td><strong>layouts</strong></td>
<td></td>
<td>stormwater</td>
<td></td>
</tr>
<tr>
<td><strong>Slope</strong></td>
<td>steep slope</td>
<td>moderate slope</td>
<td>generally flat land</td>
</tr>
<tr>
<td><strong>Paved areas</strong></td>
<td>area wholly paved</td>
<td>partially paved</td>
<td>grass up to 6m</td>
</tr>
<tr>
<td></td>
<td>surface wholly</td>
<td>areas</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sealed</td>
<td>non reinforced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>brick pavers laid</td>
<td>concrete</td>
<td></td>
</tr>
<tr>
<td></td>
<td>on sand bedding</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Verge width</strong></td>
<td>less than 3.0m</td>
<td>from 3m to 4m</td>
<td>4m or wider</td>
</tr>
<tr>
<td><strong>Building set back</strong></td>
<td>none</td>
<td>less than 6m</td>
<td>6m or greater</td>
</tr>
<tr>
<td><strong>Street lighting</strong></td>
<td>over pedestrian crossings</td>
<td>street lighting other</td>
<td>no street lighting</td>
</tr>
<tr>
<td></td>
<td>traffic intersections</td>
<td>than crossings and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>intersections</td>
<td></td>
</tr>
<tr>
<td><strong>Safety signage ie</strong></td>
<td>dual carriageways</td>
<td>medium density</td>
<td>low density</td>
</tr>
<tr>
<td><strong>traffic signs</strong></td>
<td>arterial roads</td>
<td>residential streets</td>
<td>rural/residential streets</td>
</tr>
<tr>
<td></td>
<td>high density</td>
<td>arterial roads in rural</td>
<td></td>
</tr>
<tr>
<td></td>
<td>residential streets</td>
<td>zones</td>
<td></td>
</tr>
<tr>
<td><strong>Traffic</strong></td>
<td>heavy vehicles</td>
<td>public transport in</td>
<td>public transport in</td>
</tr>
<tr>
<td></td>
<td>public transport in</td>
<td>moderate volume</td>
<td>low volume</td>
</tr>
<tr>
<td></td>
<td>heavy volumes</td>
<td>heavy vehicles in</td>
<td>residential traffic in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>moderate volumes</td>
<td>low volume</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>cul-de-sacs.</td>
</tr>
</tbody>
</table>
### Soils
- severely compacted
- shallow
- reactive clay
- acid sulphate
- poor drainage
- moderately compacted
- urban fill
- moderate drainage
- undisturbed soil
- deep profile
- medium texture
- good natural drainage

### Water table
- high
- moderate depth
- deep water table

### Tree Planting Site Characteristics

<table>
<thead>
<tr>
<th></th>
<th>A Most Constraint</th>
<th>B Moderate Constraint</th>
<th>C Least Restraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate</td>
<td>Frontline salt wind exposure</td>
<td>Second line coastal salt influence</td>
<td>Minimum salt influence</td>
</tr>
<tr>
<td></td>
<td>Prevailing wind exposure</td>
<td>Moderate wind exposure</td>
<td>Minimal wind exposure</td>
</tr>
<tr>
<td></td>
<td>Rain shadow</td>
<td>Partial rain shadow</td>
<td>No rain shadow</td>
</tr>
<tr>
<td></td>
<td>Extensive sealed ground surface</td>
<td>Partial ground surface sealed</td>
<td>Minimal ground surface sealed</td>
</tr>
<tr>
<td>Slope</td>
<td>Steep slope</td>
<td>Moderate slope</td>
<td>Minor slope to flat land</td>
</tr>
<tr>
<td>Aspect</td>
<td>Southern &amp; Western exposure</td>
<td>Either southern or western exposure</td>
<td>Northern &amp; eastern exposure</td>
</tr>
<tr>
<td>Street - Width &amp; Usage</td>
<td>Narrow; CBD residential &amp; commercial; Arterial - high traffic volume</td>
<td>Non CBD; narrow residential &amp; commercial; Suburban collector roads – medium volume traffic</td>
<td>Average to wide residential/commercial</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wide residential</td>
</tr>
<tr>
<td>Soil - Type and Drainage</td>
<td>Reactive clay Poor drainage Salinity</td>
<td>Non reactive clay Average drainage</td>
<td>Free draining open textured soil</td>
</tr>
<tr>
<td>Services</td>
<td>Above ground and below ground utilities</td>
<td>Above or below ground utility services</td>
<td>No utility services</td>
</tr>
</tbody>
</table>
## APPENDIX 5

Social and Cultural Context

<table>
<thead>
<tr>
<th>CONTEXT</th>
<th>IMPORTANCE</th>
<th>COMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Heritage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architectural style</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community values</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife habitat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Street character</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landscape character</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX 6

### Street Tree Preferred Species List

**Urban Street**

<table>
<thead>
<tr>
<th>BOTANICAL NAME</th>
<th>COMMON NAME</th>
<th>HEIGHT X WIDTH</th>
<th>CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Acmena hemilampra</td>
<td>Blush Stainash</td>
<td>8x3</td>
<td>Attractive medium sized tree to ~8m in cultivation. Young growth is red, with white flowers and fruits. Good coastal species.</td>
</tr>
<tr>
<td>2 Acmena smithii</td>
<td>Lilly Pilly</td>
<td>10x6</td>
<td>Medium sized tree to ~10m in cultivation. Bears pink edible fruits. Reliable, handsome bushy tree.</td>
</tr>
<tr>
<td>3 Acronychia imperforata</td>
<td>Coastal Aspen</td>
<td>14x10</td>
<td>Small bushy tree to ~8m, often less. Small cream star-shaped flowers, orange-yellow fruits. Good coastal plant.</td>
</tr>
<tr>
<td>4 Alloxylon flammeum</td>
<td>Tree Waratah</td>
<td>8x4</td>
<td>Medium sized tree to ~15m in cultivation. Spectacular bright red flowers borne in large clusters in spring. Well-composted soil and ample moisture recommended.</td>
</tr>
<tr>
<td>5 Alphitonia excelsa</td>
<td>Red Ash</td>
<td>15x8</td>
<td>Shrub or tree to 25m, depending on habitat. Hardy in most soils and aspects. Oval leaves to 12cm, shiny green on top, silver grey below.</td>
</tr>
<tr>
<td>6 Aetherta divaricata</td>
<td>Rose Tamarind</td>
<td>10x6</td>
<td>Medium sized tree to 15m. Tolerant of dry conditions and salt winds. Attractive new foliage. Excellent coastal tree.</td>
</tr>
<tr>
<td>7 Backhousia citriodora</td>
<td>Lemon Scented Myrtle</td>
<td>8x3</td>
<td>Medium sized tree to 15m, foliage dense to near ground. Leaves strongly lemon-scented. Good specimen tree.</td>
</tr>
<tr>
<td>8 Banksia integrifolia</td>
<td>Coast Banksia</td>
<td>15x4</td>
<td>Widely used Banksia for planting behind beach dunes. Grows to ~8m in cultivation. Pale cream flowers to 20cm occur in summer. Tolerant of salt winds, excellent hardy street tree for coastal areas.</td>
</tr>
<tr>
<td>9 Buckinghamia celcissima</td>
<td>Ivory Curl Flower Tree</td>
<td>8x4</td>
<td>Tree to ~10m in cultivation. Profuse pendulous spikes of cream flowers to 20cm occur in summer. Excellent hardy street tree.</td>
</tr>
<tr>
<td>10 Callistemon ‘Dawson River‘</td>
<td>Weeping Bottlebrush</td>
<td>6x4</td>
<td>Hybrid form of C. viminalis. Pendulous shrub to 5m, branches meeting the ground. Bright red flowers.</td>
</tr>
<tr>
<td>BOTANICAL NAME</td>
<td>COMMON NAME</td>
<td>HEIGHT X WIDTH</td>
<td>CHARACTERISTICS</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cupaniopsis anacardioides</td>
<td>Tuckeroo</td>
<td>10x4</td>
<td>Small to medium sized tree to ~10m with attractive orange fruits. Accepts salt spray. Excellent hardy street tree for coastal areas.</td>
</tr>
<tr>
<td>Diploglottis campbellii</td>
<td>Small-leaved Tamarind</td>
<td>15x4</td>
<td>Medium sized tree to 20m with shady crown. Yellow-brown fruits in summer. Prefers rich loam soils with ample moisture.</td>
</tr>
<tr>
<td>Flindersia australis</td>
<td>Native Teak</td>
<td>30x4</td>
<td>Tall tree to ~20m in cultivation. Sprays of white flowers followed by fruits opening into boat-shaped segments. Prefers heavier soils.</td>
</tr>
<tr>
<td>Harpullia pendula</td>
<td>Tulipwood</td>
<td>8x4</td>
<td>Medium sized spreading tree to 10m in cultivation. Very attractive shade tree. Suited to most soils and situations. Yellowish flowers in summer followed by showy 2cm red or yellow fruit.</td>
</tr>
<tr>
<td>Jagera pseudorhus</td>
<td>Foambark Tree</td>
<td>10x3</td>
<td>Small to medium tree to ~10m. Attractive large garden or street tree with mottled pale greyish bark. Hairs from fruits may cause skin irritation.</td>
</tr>
<tr>
<td>Lepiderema pulchella</td>
<td>Fine-leaved Tuckeroo</td>
<td>8x3</td>
<td>Small tree to ~10m in cultivation with attractive fern-like foliage. May become a weed if grown outside its natural range.</td>
</tr>
<tr>
<td>Lophostemon confertus</td>
<td>Brush Box</td>
<td>15x4</td>
<td>Tall tree to 35m, less in cultivation. Hardy in poor soils.</td>
</tr>
<tr>
<td>Randia fitzalanii</td>
<td>Native Gardenia</td>
<td>8x3</td>
<td>Small tree to ~8m in cultivation. Attractive glossy foliage, highly perfumed, small, white, tubular flowers in spring.</td>
</tr>
<tr>
<td>Syzgium australe 'Dwarf'</td>
<td>Dwarf Lillypilly</td>
<td>5x3</td>
<td>Compact form of S. australe. Foliage growing to ground level makes this plant ideal for a screen or hedge.</td>
</tr>
<tr>
<td>Tristania laurina 'Luscious'</td>
<td>Water Gum</td>
<td>7-12m tall</td>
<td>Dwarf denser form of T. laurina, with larger, glossier leaves and yellow flowers with perfumed scent. Grows in full sun to part shade.</td>
</tr>
<tr>
<td>Waterhousia floribunda</td>
<td>Weeping Lillypilly</td>
<td>15x6</td>
<td>Medium sized tree to ~15m in cultivation, with pendulous foliage. Masses of small white flowers in spring, followed by greenish fruit. Very fast growing.</td>
</tr>
<tr>
<td>Xanthostemon chrysanthus</td>
<td>Golden Penda</td>
<td>10x4</td>
<td>Medium sized tree to ~12m in cultivation. Glossy darker green leaves with reddish new growth. Showy yellow flowers occur in winter. Requires ample moisture.</td>
</tr>
<tr>
<td>Botanical Name</td>
<td>Common Name</td>
<td>Height x Width</td>
<td>Characteristics</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------</td>
<td>----------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Alphitonia excelsa</td>
<td>Red Ash</td>
<td>20+</td>
<td>Shrub or tree to 25m, depending on habitat. Hardy in most soils and aspects. Ovate leaves to 12cm, shiny green on top, silver grey below.</td>
</tr>
<tr>
<td>Araucaria cunninghamii</td>
<td>Hoop Pine</td>
<td>30+</td>
<td>Tall straight tree to 40m. Excellent indoor plant when young. Valuable timber tree.</td>
</tr>
<tr>
<td>Araucaria heterophylla</td>
<td>Norfolk Island Pine</td>
<td>30+</td>
<td>Tall stately tree to 50m. Excellent large tree for beachside plantings. Useful pot plant when small.</td>
</tr>
<tr>
<td>Brachychiton acerifolius</td>
<td>Illawarra Flame Tree</td>
<td>15+</td>
<td>Tall deciduous tree to ~20m in cultivation, with large, light green, lobed leaves to 20cm. Profuse reddish bell-shaped flowers occur in late spring, early summer when leaves are absent. Hardy in most soils if ample moisture available.</td>
</tr>
<tr>
<td>Delonix regia</td>
<td>Poinciana</td>
<td>12x10</td>
<td>Native to Madagascar, grows to ~10m tall with ~12m spread, sometimes larger. Semi-deciduous, shedding old leaves in spring, with spectacular scarlet flowers following.</td>
</tr>
<tr>
<td>Ficus rubiginosa</td>
<td>Port Jackson Fig</td>
<td>15x10</td>
<td>Variable, from shrub to large tree to 50m, depending on habitat. Leaves to 10cm, shiny above, usually with rusty hairs on underside. Yellow-orange fruits to 1cm dia.</td>
</tr>
<tr>
<td>Jacaranda mimosifolia</td>
<td>Jacaranda</td>
<td>15x10</td>
<td>Subtropical tree to 15m, native to South America. Spectacular displays of lilac flowers in spring and early summer. Potential as a weed in some areas where seedlings are able to proliferate.</td>
</tr>
<tr>
<td>Melaleuca linariifolia</td>
<td>Snow-in-summer</td>
<td>10x4</td>
<td>Small tree to 10m, spreading with age. Masses of white flowers in spring and summer. Hardy if ample moisture available.</td>
</tr>
<tr>
<td>Melaleuca quinquenervia</td>
<td>Broadleaf Paperbark</td>
<td>20+</td>
<td>Small to medium sized tree to 25m with papery bark. Flowers creamy-white or rarely red. Excellent for damp conditions.</td>
</tr>
<tr>
<td>Melicope elleryana</td>
<td>Pink Euodia</td>
<td>15+</td>
<td>Small to medium sized tree to ~15m. Leaves trifoliate, with elliptical leaflets to 12cm. Small pink flowers borne on branches. May become a weed if grown outside its natural range.</td>
</tr>
<tr>
<td>Stenocarpus sinuatus</td>
<td>Firewheel Tree</td>
<td>25+</td>
<td>Tall tree to 30m, less in cultivation. Dark green lobed leaves to 30cm long. Orange red flowers borne in whorls in early summer. Spectacular specimen tree.</td>
</tr>
</tbody>
</table>
## APPENDIX 7

### Risk Management Control Strategies

<table>
<thead>
<tr>
<th>CONTROL STRATEGY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| Root barriers               | Installation of root barriers to manufacturers specification at the time of planting will assist tree roots to develop away from services, pavements and other structures.  
                              | NOTE OF CAUTION Tree root barriers do require periodic monitoring as roots deflected downwards will return to the surface if soil oxygen levels are not sufficient to support growth at depth. Roots can also grow over the barrier in some situations. |
| Soil compaction             | Proper compaction of the soil when back filling trenches or around utility easements and house footings will direct tree roots away from these areas. By achieving and maintaining compaction to 95% root growth can be inhibited through the depravation of oxygen. |
| Pseudo street trees         | Residents could be encouraged to plant trees within their boundaries in preference to street tree planting. This might allow larger species to be used, and reduce pressure on pavements and services. |
| Design of new roads and pathways | The design of new roads and footpaths should be undertaken with consideration for tree planting on the nature strip or in the road pavement to ensure appropriate allocation of space. |
| Provision of aeration and irrigation | Where there is to be continuous paving around a tree, the installation of an aeration and irrigation system should be considered. Where irrigation is installed and properly operating, a tree root system will be proportionally smaller than without irrigation. |
| Pavement Openings           | Pavement openings at the base of the tree should be as large as possible to reduce the future impact of buttressing roots on pavements. Position of the tree should be a good distance (eg 1 m) from the kerb line to reduce the likelihood of future cracking. |
APPENDIX 8

Tree and Shrub Planting Guidelines
NOTE:
- Pavement tree plantings are to be a minimum size of 200 litres.

TREE GUARD
- TYPE: T50 OR SIMILAR (MUST BE APPROVED)
- CAST ALUMINIUM STANDARD HEIGHT
- BOLT FIXES WITH INTEGRATE SYSTEM
- FINISH: DULUX "Berry Grey" 81933
- SUPPLIER: Street Furniture Australia

Tree is to be securely fixed to tree guard to prevent excess movement.

If no tree guard is to be used, 2/3/4x50 hardwood stakes driven into the ground outside of the rootball are to be installed with a knitex.

Knitex tree tie stakes are not to interfere with branch system.

TRUNK TO BE BRANCH AND SUCKER FREE FOR A MINIMUM 1000MM HEIGHT.

TREE GRATE
- TYPE: SQUARE TREE GRATE 600 OR SIMILAR
- CAST ALUMINIUM 1200 x 1200
- MOUNTED FLUSH WITH HDBR
- FINISH: DULUX "Berry Grey" 81933
- SUPPLIER: Street Furniture Australia

INSTALL TO MANUFACTURER'S DETAIL.

KERB AND CHANNEL
- INSTALL A 600MM WIDE FOOT BARRIER.
- FOR OR SIMILAR APPROVED BACCELL.

IMPORTED TOPSOIL AND TERRACOTTA TO MANUFACTURER'S DETAIL.

BREAK-UP BASE & ADD 1m OF EXPANSION IF CLAY SOILS FÖUNING, MORE IF SANDY SOILS

PAVEMENT TREE PLANTING DETAIL
SECTION 1:30
ADVANCED TREES SHALL BE CONTAINER GROWN WITH STURDY SINGLE STRAIGHT TRUNK OF SPECIFIED POT & CALIPER SIZE,
SELF-SUPPORTING, HARDENED-OFF & DISEASE FREE.
TREES SHALL BE PLANTED WITHOUT INDICATION OF ROOT CURL, RESTRICTION OR DAMAGE.
FILL HOLE WITH TREE, BULB, POT & BREAK-UP BASE OF HOLE WITH CROWBAR, ADD 1m OF ALL EXPANSION.
REMOTE TREE FROM CONTAINER.
TREE SHALL BE POSITIONED IN THE CENTRE, PLUMB.
THOROUGHLY WET "FIRBACOTTA" WITH TOPSOIL TO MANUFACTURER'S DETAIL.
BACKFILL TREE HOLE WITH IMPORTED TOPSOIL, AS SPECIFIED, PROGRESSIVELY COMPACT, INSTALLED TRUNK GUARD AS SPECIFIED.
INSTALL MINIMUM 1M DIA. STAKES AND KNITEX KNITTED NYLON TREE TIE IF NO TREE GUARD IS TO BE USED, TREE GUARD AS ALTERNATIVE. AVOIDING ROOTBALL DAMAGE.

S. D. 705
LANDSCAPING STANDARDS
TWEED SHIRE COUNCIL

TREE PLANTING IN PAVEMENT DETAIL

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APPENDIX 9

Tree Inspection Form

<table>
<thead>
<tr>
<th>Species</th>
<th>Age Class</th>
<th>DBH* (mm)</th>
<th>Est. Height (m)</th>
<th>CONDITION CLASS</th>
<th>RELEVANT SITE DETAILS / SURROUNDING HAZARDS:</th>
<th>ACTION CODE:</th>
<th>COMMENTS / SPECIFICATIONS / LIAISON / FOLLOW UP ETC:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Leaves</td>
<td>Branches</td>
<td>Trunk</td>
<td>Roots</td>
</tr>
</tbody>
</table>

* Diameter at breast height

**CODES:**
- **AGE CLASS:**
  - Y = Young
  - G = Good
- **CONDITION CLASS:**
  - A = Average
  - P = Poor
- **ACTION CODE:**
  - 1 = None
  - 2 = Fill
  - 3 = Remove dead wood
  - 4 = Remove sucker growth
  - 5 = Lift crown
  - 6 = Thin crown
  - 7 = Crown reshape/renew
  - 8 = Investigate cavity
  - 9 = Adjust stake & tie
  - 10 = Insect control
  - 11 = Fertilise
  - 12 = Other