



Wingecarribee Street Tree Implementation Plan

2016



Adopted May 2016

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1.0 Introduction

1.1 How to Use This Plan

This plan provides Council with a comprehensive set of actions and procedures to ensure the objectives of the Wingecarribee Street Tree Master Plan have the potential to be realised. The document is designed to enable planning and budgeting for future street tree works in accordance with Council's strategic direction. The full implementation of the actions listed in this plan requires considerable resources and may take decades to complete.

Section 2.0 of this plan provides tables of priority actions for implementation and lists of specific streets within each urban centre that present opportunities for particular implementation actions. Council should consider their available resources, future development and the potential community benefits in prioritising street tree related works.

Section 3.0 and 4.0 of this plan provides guidance on the on-going management of street tree related works and serves as a reference for best practice street tree removal, design, installation and maintenance.

1.2 Implementation Plan Review Period

This document is one part of Wingecarribee's suite of documents used to proactively manage its tree resources. Trees, like all living things, grow, age and eventually die. It is therefore important that the implementation plan is reviewed and updated to reflect changes in the street tree population particularly where major capital works projects have been completed. The progress of the Plan will be reviewed annually with a comprehensive review at no longer than 5 years from its adoption. Each review should set the priorities for street tree related works for the proceeding years.



Figure 1.1 - The future of our streets depends on what we do today. Wingecarribee has a patchwork of different trees in its streets. (Photo - Arterra)

2.0 Street Tree Implementation Priorities and Action Plan

2.1 Street Tree Implementation Priorities

This Implementation Plan provides Council with a clear direction to the ongoing management of street trees in Wingecarribee. Specifically, this document recommends the following key priority areas to be targeted by Council in its management of the street tree resources:-

- Planning and implementation of street tree planting on main and collector roads within the urban centres to improve the consistency and appearance of streets and enhance the unique characteristics of each urban centre.
- Removal of large disfigured trees under powerlines to reduce the conflict between street trees and existing services.
- Identification of streets where the implementation of ABC (Aerial Bundle Conductors) overhead wiring should be budgeted and prioritised.
- Investigation and implementation of in-road planting opportunities where existing narrow verges or services prevent or severely limit street tree planting.
- Planting of trees in streets where there are opportunities to establish additional planting of larger trees to improve the look of the streets and the overall canopy cover.
- Place more emphasis on appropriate and best-practice planting design to improve the success of the trees and reduce the likelihood of future infrastructure damage.
- Greater scrutiny of proposed new and replacement planting sites based on the expected and ultimate size of the tree and assessment of the surrounding key infrastructure and services clearance.
- Improved procurement of tree stock with forward planned installation periods and advanced ordering of quality plants in suitable sizes.
- Proactive maintenance practices such as formative pruning and mulching around the base of young trees to achieve good quality, well-structured and low maintenance trees well into the future.

Actions associated with each of the above priorities be equally spread across all urban areas, as far as reasonably practicable, to avoid some urban areas receiving no attention for some years.

2.2 Action Plan

Priority Capital Works and Urban Centre Projects

A list of priority projects that address the objectives of the STMP are identified in Table 1 below. The following criterion were used to establish the list of priorities to ensure the greatest benefit to the community:-

- improves amenity for pedestrians
- improves appearance of main street or collector road
- increases canopy cover within the commercial core of an urban centre
- provides shade for expansive paved/road surfaces
- reduces or eliminates conflict between street trees and services
- provides a strong visual link between important civic spaces
- significant community interest and support has been expressed and documented for a project

The following tasks should be undertaken for each of the priority projects:-

- Detailed survey of street including: kerb and gutter, carriageway and road reserve, existing trees and structures, adjacent buildings and awnings, and existing above and below ground services.
- Tree planting plan in accordance with the Street Tree Master Plan initiatives and controls for each urban centre prepared by a suitably qualified landscape architect in close consultation with a consulting arborist.
- Coordination of tree planting with infrastructure and traffic requirements including consideration of stormwater management and irrigation of proposed trees. Any programmed upgrades to above and below ground services should be taken into account when planning tree planting.
- Community Consultation to discuss changes to streetscape and potential impacts to residents and businesses.

Table 1 - PRIORITY CAPITAL WORKS AND URBAN CENTRE PROJECTS	
URBAN CENTRE	Street Name
1.1 Bowral	Bong Bong Street between Bundaroo St and Bowral St
1.2 Mittagong	Queen Street between Alfred St and Main St
1.3 Mittagong	Old Hume Highway (Main Street) between Beatrice St and the Iron Mines Oval (Golden Mile)
LARGE VILLAGE	Street Name
2.1 Berrima	Old Hume Highway between Oxley St and Jellore St
SMALL VILLAGE	Street Name
3.9 Wingello	Corner of Railway Street and Murimba Road
3.6 Hill Top	West Parade between Fitzroy St and Rosina St

Priority Street Tree Planting on Main Streets, Collector Roads and to define the Commercial Core or Village Centre

The following tasks should be undertaken for street tree planting on each of the main streets, collector roads and within the commercial core as identified in table 2 below:-

- Assess street including: kerb and gutter, carriageway and road reserve, existing trees and structures, adjacent buildings and awnings, and existing above and belowground services.
- Tree planting plan in accordance with the Street Tree Master Plan initiatives and controls for each urban centre.
- Coordination of tree planting with infrastructure and traffic requirements including consideration of stormwater management and irrigation of proposed trees. Any programmed upgrades to above and below ground services should be taken into account when planning tree planting.
- Community Consultation to discuss changes to streetscape and potential impacts to residents and businesses.

Table 2 - PRIORITY STREET TREE PLANTING ON MAIN STREETS, COLLECTOR ROADS AND TO DEFINE THE COMMERCIAL CORE OR VILLAGE CENTRE

Street Name	Between Streets
1.1 Bowral	
Bong Bong Street	Bundaroo St - Bowral St
Moss Vale Road	Funston St - Beavan Pl
Kangaloon Road	Moss Vale Rd - David St
Merrigang Street	Station St - Bendooley St
Bowral Street	Station St - Bong Bong St
Wingecarribee Street	Station St - Short St
Boolwey Street	Station St - Edward St
Banyette Street	Station St - Bong Bong St
1.2 Mittagong	
Old Hume Highway	Bessemer St - Queen St
Old Hume Highway	Louisa St - Beatrice St
Bowral Road	Old Bowral Rd - Bessemer St
Queen Street	
Victoria Street	Arthur St - Main St
Alice Street	Arthur St - Main St
Princes Street	Bowral St - Regent St
1.3 Moss Vale	
Argyle Street	Illawara Line Railway Crossing - Robertson Rd
Argyle Street	Valetta St - Lackey Rd
Arthur Street/Spencer Street	Argyle St - Yarrawa St
Robertson Road	Argyle St - Pine St
Waite Street/Berrima Road	Argyle St - Resource Recovery Centre
White Street	Argyle St - Elizabeth St
Valetta Street	Argyle St - Elizabeth St
Clarence Street	Valetta St - White St
Throsby Street	Arthur St - Yarrawa St
2.1 Berrima	
Old Hume Highway	Jellore St - Market Pl
2.2 Bundanoon	

Anzac Parade	Penrose Rd - Church St
2.3 Burradoo	
Moss Vale Road	Links Rd - Elizabeth St
2.4 Robertson	
Caalong Street	May St - Hoddle St
3.1 Balmoral	
Cnr Railway Square and Level Crossing	
3.2 Burrawang	
Nil	
3.3 Colo Vale	
Cnr Wattle Street and Railway Avenue	
Wattle Street	Pine St - Railway Ave
3.4 Exeter	
Nil	
3.5 Fitzroy Falls	
Nil	
3.6 Hill Top	
West Parade	Fitzroy St - Vera St
Rosina Street	Cumberteen St - West Pde
Linda Street	Cumberteen St - West Pde
3.7 Penrose	
Nil	
3.8 Sutton Forest	
Cnr Illawarra Hwy and Exeter Road	
3.9 Wingello	
Murrumba Road	Marulan St - Sydney St
3.10 Yerrinbool	
Cnr Everest St and Old Hume Highway	
Old Hume Highway	The Falls Rd - Government Rd

ABC Priority Streets

During fieldwork and review for the preparation of the Street Tree Master Plan 2015 the following streets were identified as 'priority' streets for the expansion or the introduction of Aerial Bundled Conductor (ABC) overhead wiring.

This has been based primarily on identifying streets where existing tree health and forms would be substantially improved or where recent street tree planting has been undertaken and the introduction of ABC will prevent the need for disfiguring pruning practices needed to be employed as the tree encroaches on the wires.

Table 3 - STREETS FOR PRIORITY ABC INSTALLATION	
Street Name	Between Streets
1.1 Bowral	
Ascot Road	Albert St - Old South Rd
Bendooley Street	Boolwey St - Wingecarribee St
Funston Street	
Merrigang Street	Stattion St - Bendooley St
Walker Street	
1.2 Mittagong	
Alfred Street	Louisa St - Victoria St
Alice Street	Alfred St - Main St
Bowral Rd	Henderson Ave - Old Bowral Rd
Helena Street	Alfred St - Main St
Helena Street	Leopold St - Arthur St
Mittagong Street	
Old Hume Highway	Alice St - Louisa St
Sunset Point Drive	
Vernon Street	
1.3 Moss Vale	
Arthur Street	Argyle St - Throsby St
Merrett Drive	
North Street	
Throsby Street	Arthur St - Chapman St
Valetta Street	
Waite St	Browley St - Argyle St
2.1 Berrima	
Jellore Street	
Market Place	
Old Hume Highway	Oxley St - Jellore St
WIngecarribee Street	
2.1 New Berrima	
Adelaide Street (New Berrima)	Australia Ave - Ennis Ave
Melbourne Street (New Berrima)	
Sydney Street (New Berrima)	
2.2 Bundanoon	
Anzac Parade	
Amy Street	
Burgess St	
Ebury Street	Ellsmore Rd - Hill St
Ellsmore Road	Erith St - Nerrim St

Hill Street	Old Wingello Rd - Erith St
2.3 Burradoo	
Nil	
2.4 Robertson	
Hoddle Street	
3.1 Balmoral	
Railway Parade	Elms Pl - River St
3.2 Burrawang	
Church Street	Dale St - Range St
Dale Street	
Hoddle Street	
Region Street	Hoddle St - Range St
3.3 Colo Vale	
Banksia Street	Telopea St - Wattle St
3.4 Exeter	
Nil	
3.5 Fitzroy Falls	
Nil	
3.6 Hill Top	
West Parade	Raglan St - Rosina St
Linda Street	Cumberteen St - West Pde
3.7 Penrose	
Nil	
3.8 Sutton Forest	
Nil	
3.9 Wingello	
Nil	
3.10 Yerrinbool	
Nil	

Priority In-Road Planting

During fieldwork and review for the preparation of the Street Tree Master Plan 2015, some streets were identified where new in-road planting or re-aligned kerbs should be explored. This reduces conflict with overhead power lines, reduces the perceived width of street, may allow shrub planting under canopy trees, and allows for larger trees to be planted.

In-road planting can also allow tree planting where verges are otherwise too narrow and where there would otherwise be no trees at all in a street. They do not have to be regularly or closely spaced, as even a few trees can make a huge difference to how a street looks and feels.

The streets listed below have been identified as streets having opportunities to plant within the current road carriageway, with the objective to plant larger canopy street trees that are further away from overhead power lines and thereby reduce the apparent width of the road carriageway, calming traffic and/or providing a more aesthetically pleasing street. This also allows trees to be planted further away from nearby houses, shops or awnings. Many of these opportunities could be combined with rearrangement of parking and provisions for perpendicular or angled parking to minimise parking loss, and in some instances even increase the parking opportunities.

Water Sensitive Urban Design (WSUD) opportunities may also be identified with some of these proposals, subject to the installation of suitably drained tree pits, and consideration of drainage and other raingarden/ biofiltration parameters. It should be noted, the viability of in-road planting / WSUD installation for each of the streets identified will be subject to further detailed investigation including most importantly the proper location of underground services, subsoil drainage, and traffic and parking considerations.

2.4 Robertson	
Hoddle Street	
3.1 Balmoral	
Nil	
3.2 Burrawang	
Nil	
3.3 Colo Vale	
Nil	
3.4 Exeter	
Nil	
3.5 Fitzroy Falls	
Nil	
3.6 Hill Top	
West Parade	Fitzroy St - Vera St
3.7 Penrose	
Nil	
3.8 Sutton Forest	
Nil	
3.9 Wingello	
Nil	
3.10 Yerrinbool	
Nil	

Table 4 - STREETS FOR PRIORITY IN-ROAD PLANTING	
Street Name	Between Streets
1.1 Bowral	
Banyette Street	Station St - Bong Bong St
Boolwey Street	Station St - Bendooley St
Wingecarribee Street	
1.2 Mittagong	
Albion Street	
Princess Street	
Station Street	
Victoria Street	Albert St - Main St
1.3 Moss Vale	
Argyle Street	Valetta St - Lackey Rd
Arthur Street	
Clarence Street	Valetta St - White St
Valetta Street	Argyle St - Elizabeth
Waite Street	Browley St - Argyle St
White Street	Argyle St - Elizabeth St
2.1 Berrima and New Berrima	
Nil	
2.2 Bundanoon	
Anzac Parade	
2.3 Burradoo	
Nil	

Opportunities For Planting in Existing Verges

During fieldwork and review for the preparation of the Street Tree Master Plan 2015 the following streets were identified as having opportunities for new in verge planting. Council needs to continue to be proactive and actively target some streets where trees are failing or there is no existing planting and respond by providing a holistic and integrated solution to engineering, services, soil and trees. Possible streets that may be targeted include:

Table 5 - STREETS WITH EXISTING PLANTING OPPORTUNITIES	
Street Name	Between Streets
1.1 Bowral	
Ascot Road	Mona Rd - Old South Rd
Belmore Street	
Carrington Street	
Church Street	
Denbigh Drive	
Glenrowan Grove	
Hansen Street	
Jonathan Street	
Loftus Street	
Milton Street	
Park Road	
Purcell Street	
Rowland Road	
Una Street	
Warenda Street	
1.2 Mittagong	
Albert Street	Bessemer St - Alice St
Alfred Street	
Arthur Street	
Bendooley Street	
Bessemer Street	
Brewster Street	
Bowral Street	
Cavendish Street	
Colo Street	
Cook Street	
Crimea Street	
Edward Street	Pioneer St - Helena St
Elizabeth Street	
Etheridge Street	
Faraday Street	
Fitzroy Street	Main St - Regent St
Jellore Street	
Joadja Street	
Lee Street	
Louisa Street	
Lyell Street	
Merranie Street	
Mittagong Street	

Oxford Street	
Railway Parade	Bessemer St - Range St
Regent Street	Range St - Princess St
Southey Street	
Victoria Street	
William Street	
1.3 Moss Vale	
Campbell Crescent	
Kirkham Street	South of Mack St
North Street	
Price Street	
Wyatt Street	
Willow Drive	
Yarrawa Street	
2.1 Berrima	
Oxley Street	
Taylor Street	
2.1 New Berrima	
Adelaide Street	
Brisbane Street	
Ennis Street	
Howard Street	
Melbourne Street	
Sydney Street	
2.2 Bundanoon	
Amy Street	
Brigadoon Drive	
Ebury Street	
Hill Street	
Old Wingello Road	
Penrose Road	
William Street	
2.3 Burradoo	
Bruce Street	
Burradoo Road	
Holly Road	
Osborne Street	
Romney Place	
Toongoon Road	
2.4 Robertson	
Barrengarry Street	
Burrawang Street	
Camp Street	
Main Street	
Meryla Street	
North Street	
South Street	
3.1 Balmoral	
Railway Parade	

3.2 Burrawang	
Nil	
3.3 Colo Vale	
Banksia Street	
Pine Street	
Wattle Street	
3.4 Exeter	
Middle Road	
3.5 Fitzroy Falls	
Nil	
3.6 Hill Top	
Linda Street	
Rosina Street	
3.7 Penrose	
Nil	
3.8 Sutton Forest	
Golden Vale Road	
Illawarra Highway	Golden Vale Rd - Dittons Ln
3.9 Wingello	
Murrimba Road	Marulan St - Sydney St
Sydney Street	Murrimba St - Mundego St
3.10 Yerrinbool	
Andes Street	
Remembrance Drive	
Sierra Street	
Sunrise Road	

2.3 Costs and Resourcing

The priorities set out in this Implementation Plan will require a commensurate commitment from Council, Council staff and the wider community. Appropriate funding, both recurrent and one-off capital injections will need to be provided as part of this plan, to achieve the objectives and allow the implementation of key priorities.

To achieve this plan Council will need to consider:

- Allocating or employing suitable Council staff to oversee and co-ordinate all street tree planting programs, including advanced plant procurement, supply methods and contracts, and the appropriate scheduling and resourcing of planting programs and after care.
- Allocating appropriate one-off and recurrent funding to the achievement of this Plan. A broad estimate of potential funding requirements is outlined below to assist and guide Councils priorities.
- Maintaining suitably resourced and appropriately trained staff (or contractors) concerned with the ongoing management and pruning of mature street trees.

Table 6 - GENERAL ESTIMATES OF CURRENT ANNUAL BUDGETARY COST FOR TREE PLANTING AND MAINTENANCE ACTIVITIES				
Priority Item	Description	Estimated Budget Rates	Quantity	Sub-Total/Year
Tree Removals	Allowance for removal of dead, declining and hazardous and problematic trees	\$ 760 / tree	336	\$255,360
Tree Pruning	Allowance for tree pruning, dead wooding and formative pruning	\$ 210 / tree	496	\$104,160
Street Tree Inventory Maintenance/Update	Allowance for continuing cyclic update of existing street tree inventory - updating and reviewing 1-2 precincts per year.	\$ 15,000/ year	1 (approx. 1,700 trees/year)	\$15,000
New Street Tree Planting (includes tree supply, delivery and installation, excavation of tree pit, tree surrounds, staking, traffic control etc.)	45 L tree planting (small tree supply and install)	\$ 250 / tree	80	\$20,000
Establishment and Formative Pruning	Allowance for watering, weeding and annual formative pruning for the above tree planting (per year)	\$ 80 / tree	80	\$6,400
Annual Budget				\$400,920

Table 7 - GENERAL ESTIMATES OF ANNUAL BUDGETARY COST FOR TREE PLANTING ACTIVITIES				
Priority Item	Description	Estimated Budget Rates	Quantity	Sub-Total/Year
New Street Tree Planting (includes tree supply, delivery and installation, excavation of tree pit, tree surrounds, staking, traffic control etc.)	45 L Tree planting (small tree supply and install)	\$ 250 / tree	250	\$62,500
	75 - 100 L Tree Planting (medium tree supply and install)	\$ 1,200 / tree	10	\$12,000
	150 - 200 L Tree Planting (large tree supply and install)	\$ 2,500 / tree	25	\$62,500
	400 L (and above) Tree Planting (special feature tree supply and install)	\$ 5,000 / tree	5	\$25,000
Establishment and Formative Pruning	Allowance for watering, weeding and annual formative pruning for the above tree planting (per year)	\$ 80 / tree	290	\$23,200
Resident Request for Tree Planting on Verge	45 L Tree planting (small tree supply and install)	\$ 250 / tree	30	\$7,500
Street Tree Promotion and Education Program	Allowance for community engagement based activities and promotion of street trees, Website, and Tree care information.	\$ 3,000/ year	1	\$3,000
Annual Budget				\$195,700

Table 8 - GENERAL ESTIMATES OF ANNUAL BUDGETARY COST FOR SPECIAL PROJECTS				
Priority Item	Description	Estimated Budget Rates	Quantity	Sub-Total/Year
ABC Installation	Allowance to negotiate with Ausgrid and facilitate installation of segments or lengths of ABC where currently none exists, with priority given to the streets identified in this Plan. Aim to achieve all main and collector street in Urban Centres ABC'd by 2020.	\$ 7,000 / span	15	\$105,000
Major Road Upgrade (eg, Bong Bong Street, Bowral or Old Hume Highway, Berrima or Queen Street, Mittagong)	Survey of street and mapping of existing trees and services	\$ 15,000 / street	1	\$15,000
	Concept design for Community Consultation	\$ 15,000 / street	1	\$15,000
	Community Engagement Activities	\$ 5,000 / street	1	\$5,000
	Detailed Design and Documentation for Construction	\$ 35,000 / street	1	\$35,000
	Allowance for in-road Installation and creation of median and blisters, necessary road work, signage, lane marking, services installation and re-directions. (includes tree supply, delivery and installation, tree pit preparation, excavation and tree surrounds, staking, traffic control etc.)	\$ 250,000-\$400,000 / street	1	\$250,000-\$400,000
Annual Budget				\$425,000-\$575,000

3.0 Street Tree Management Principles and Procedures

3.1 Tree Removals and Replacements

Council aims to continue existing street characters and tree planting as much as possible, unless there are specific issues or problems to address or there are clear opportunities for streetscape or canopy cover improvements. Generally, Council will not consider leaf, fruit, sap or bark drop or bird and bat droppings as valid reasons to prune or remove a street tree. These are natural processes of normal tree growth and use by wildlife.

Council will seldom remove a healthy street tree. If a certain type of tree is proposed for a street within this Plan, it does not mean that Council will remove the existing street trees in the short term to implement any new species. This will only happen gradually over time, as trees need replacing or if a specific opportunity exists to plant a new tree in an otherwise vacant area.

As such, existing street trees, regardless of species will normally be left to grow for their natural life and will only be removed if they have become a safety issue, an unacceptable hazard or on going remedial tree or infrastructure works are unviable. The exception to this policy may be when major street improvements or upgrade works are required or there is a specific plan to revitalise a street or area. Even then, unnecessary tree removal will still be avoided where possible.

Street Tree Removals and Replacements

Council aims to maintain and conserve the overall canopy coverage within the LGA. Council will remove street trees in the following circumstances:

- The tree is dead or dying, or unacceptably disfigured or poorly formed.
- The tree is assessed as being hazardous due to recognisable structural or health defects and where remedial or selective pruning cannot eliminate the risk, or where such pruning will leave the tree unacceptably disfigured or poorly formed.
- The tree is causing public infrastructure damage, which is considered significant and cannot be overcome by other reasonable and practical measures.
- The tree is causing significant damage to significant private structures. It will typically be a requirement to positively establish that the tree is causing the damage and that the damage is 'significant' and that continued and future damage cannot be overcome by other reasonable and practical measures.
- Any other reason, at the discretion of Council's staff, which can be justified by either technical or legal grounds according to particular circumstances.

In regard to the above, 'significant' damage is a relative term, and will usually be assessed with respect to the likelihood of repetitive repairs and the relative costs compared to the amenity value of the individual tree. For example repairs or replacement of footpath pavements or kerbs once every 10-15 years due to tree root growth would generally be considered acceptable. However, the replacement of a footpath every 2-3 years and a tree that will continue to substantially increase in size would indicate that the tree is generally unsuitable for the location.

Likewise, it is also necessary to consider the severity, age and nature of any private property damage and how quantifiable the damage is being caused solely by the tree. If the structure

is a relatively minor outbuilding, or landscape wall or the suitability or quality of construction is questionable, it may be of greater over-riding benefit to retain the tree as the more significant item. Obviously, if the damage is clearly related to the Council's tree and is affecting the structural integrity of a dwelling or other important structure, then clearly tree removal must be considered. As a rule this will generally be determined on a case by case basis.

If an owner is claiming that damage is being caused by a Council street tree, the owner must furnish reasonable proof that the damage is directly attributable to the tree. Root and species identification may be necessary if more than one tree may be contributing to the damage.

The removal of a tree is generally not considered justified when damage is restricted to minor works such as unit paving, fencing or footpaths and driveways or to a deteriorating sewer or drainage line where reasonable and practical repairs can be carried out. This is a principle largely upheld by the NSW Land and Environment Court.

Where a street tree is removed, Council will install a suitable replacement tree at or very close to the removal site. They will follow the spacing and placement guidelines outlined in the Street Tree Master Plan document and may locally adjust the placement as needed. The replacement species shall be as outlined in the Street Tree Master Plan for that particular street. Where a choice of species is provided the species selected will take into consideration the localised environmental, functional and aesthetic aims and the reason for the previous trees removal. The species selected shall be at the sole discretion of the Council.

Notification of Tree Removals and Planting

Where practicable and feasible the Council will provide at least 14 days notice for the planned removal of street trees. This notification will typically be in accordance with Table 9 via a notice on the Councils website and a notice attached to the tree. For emergency removal or minor street tree removal, typically no notice will be provided.

Table 9 - STREET TREE REMOVALS	
Activity	Notification Period and Extent
Emergency Removal	<ul style="list-style-type: none"> • No prior notification • Advice on Council's website
Minor Street Shrub Removal (including trees up to 5m)	<ul style="list-style-type: none"> • 14 days prior notification to 3 adjacent properties stating reason for removal
Standard Street Tree Removal	<ul style="list-style-type: none"> • 14 days prior notification to adjacent properties and those opposite stating reason for removal • Notice attached to tree • Proposed tree removal included on Council's website

Table 10 - STREET TREE PLANTING	
Activity	Notification Period and Extent
Standard Street Tree Planting	<ul style="list-style-type: none"> • 28 days prior notification to adjacent properties and planting location marked on ground • Proposed tree planting included on Council's website
Major Street Upgrade	<ul style="list-style-type: none"> • Concept design provided to entire street for comment and exhibited on Council's Website for a period of 28 days. • 28 days prior notification to entire street and side streets before commencement of planting

Major Upgrades, Removal Timing and Strategies

Council's method for tree removal and replacement in any given street depends on a number of important and inter-related factors:

- Size and significance of the trees being replaced
- Whether they are part of a consistent avenue planting
- The nature of the problem that they may be causing
- The nature of the replacement trees being suggested and whether there will be room under other existing trees for the new planting.

For particularly significant trees or isolated trees that are not part of a recognised avenue planting, they will typically be removed one at a time and replaced with a suitable new tree. This allows the trees to be replaced gradually without significant impacts to the overall amenity of the area.

This may not be effective if the trees are part of a larger grouping or if major street changes or improved planting techniques are proposed. In such cases, Council will be seeking to achieve economies of scale in the new works and flexibility in addressing new footpaths, services or road works that may otherwise damage existing trees.

When the trees are part of a group or avenue, the Council will typically remove the identified problem or substandard trees as small groups. For long avenues this will typically be in a 'block' style replacement leaving some groups or 'blocks' remaining in between the new planting. This keeps the overall integrity of the street planting while replacements begin to mature. As the new planting matures the Council will return to remove the remaining 'blocks'. Depending on the size of trees being replaced and the length and importance of the avenue, this process will usually be completed over a 5-8 year program in either 2-3 stages, leaving 2-3 years between removals and replacements. This length of time is important so that Council can properly program and budget the works and also to allow time for the new trees to reach a suitable size before removing further trees.

3.2 Tree Planting, Watering and Establishment

The implementation of any new street tree planting needs to be carefully planned and considered. This will involve the critical elements below:

- The quality and species of the trees planted
- The size at which they are planted and
- The way it is physically planted and cared for in the first few weeks and months.

Planting time is also important. Most, if not all tree planting in Wingecarribee Shire, should be undertaken in either Autumn or Winter. This will greatly increase the success of the planting and reduce the establishment maintenance burden. Staff (or contractors) should focus on planting during these times and then focus on after-care activities, such as watering, weeding and formative pruning in the summer months.

New street planting will typically not be installed under the canopy or within very close proximity to larger and overhanging trees (either street, park or private). The resulting habit and condition of the newly planted tree is severely compromised, often resulting in a substandard tree form and future maintenance issues. Council officers prior to the finalisation of any planting program must assess this sort of conflict.

Similarly each tree planting site needs to be carefully assessed for potential future conflicts with existing or planned infrastructure. Future issues and unnecessary tree removals and pruning can be avoided if the tree is not put too close to street lighting, signage, walls, bus stops etc. Refer to appendix 4.1 for further guidance. Of course some of these final decisions will need to be judgement calls based on the benefit of the tree, the traffic volumes of the street and the nature of the conflict. Council officers shall have the final say on whether a tree is planted or not. Council officers may also use discretion and change from the scheduled species for considerations (such as underground services) in an attempt to still provide tree planting in a given location.

Planting method and approach is also an important aspect in the final success of any tree planting, but especially street tree planting. For Wingecarribee Shire, planting shall typically adhere to the standard tree planting details and specifications provided in the Appendices.

The following shall be observed and implemented during typical street tree planting:

- Quality Imported Backfill Soil shall be applied.
- Planting pits (particularly within pavement) shall be made as large as possible.
- Pre-planting root pruning shall be undertaken for each tree upon planting.
- Protective staking to be installed around the tree to identify it as new planting and protect it from casual and accidental interference.
- Mulch the surrounds of each tree.
- Water the tree thoroughly upon planting and then at regular intervals.
- Formative Pruning should be undertaken as required. Refer to the Section 3.3 following.

3.3 Formative Pruning and Mature Tree Pruning

Many defects that lead to later tree problems and failures are present in the tree upon delivery from the nursery and the initial planting. For example:

1. Included branches
2. Co-dominant and tri-dominant stems
3. Congested branching architecture
4. Crossing and rubbing branches
5. Leans
6. Poor root development and girdling roots

Proper tree procurement as outlined in Appendix 4.2 will help in preventing many of these issues but cannot deal with all of them.

At an early age many of these problems seem insignificant and unimportant. The tree, branches and defects are relatively small. These branches however are often the trunks and branches that are the major branches of the tree when it matures and as it grows so do the size of the trunks and these branches. A 25-50mm branch today will be the 200mm branch in 10 years time. Likewise, branches are typically at the same point in the tree in the mature tree as they are when young. Plants elongate from the ends, and the early trunks and stems just expand in girth, they do not move upwards in the tree. For example, if the tree currently has a major branch at 1.5m high, that major branch will always be emanating from about 1.5m high on the tree. When it is small that may not be an issue, but when the tree is mature this may not be desirable for clearances around and under the tree.

Small defects can become more serious and much larger as the tree grows. If failure occurs in maturity, any damage or injury caused by the failure is likely to be greater. Also when a tree is mature, the ability to rectify these defects becomes substantially more difficult and costly. It also involves removing potentially very large branches, large amounts of foliage and pruning into heartwood and leaving substantial wounds that the tree expends reserves trying to compensate for and seal around the wounds. It also opens up avenues for decay organisms to enter and affect the structural integrity of the tree. The result of failures later in a tree's life usually results in excessive tearouts and trunk wounds and subsequently, poorly formed trees for the remainder of their life.

The far better and more cost effective way to manage the younger and newly planted street trees is to undertake a targeted and comprehensive 'formative pruning' program. The time and resources to remove a few 20-50mm diameter branches is miniscule compared to the cost of removing the same defects in a mature tree 10-20 years later, where chainsaws, traffic control and chippers are required. It will also ultimately result, in a far better formed tree, free of defects as it grows and one that will positively contribute to the landscape and pose minimal hazard and risk to the residents and public for many years. Research has consistently shown the return on investment is hugely disproportionate, when comparing formative pruning with that of tree care in later life. (Ryder and Moore 2013)

Council should adopt a yearly program of formative pruning, targeting all newly planted and younger trees for a period of 3 years after installation. Although it may seem drastic, all major inclusions should be removed and lower lateral branches should be either removed or subordinated on the trees to force a much stronger central leader that is both ultimately higher and more dominant than would otherwise be if the tree were left untrimmed. This will mean that when the tree is gradually

crown raised to provide better clearances for pedestrians and vehicles the cuts are quite small and easily accommodated, (rather than removing very large branches and potentially exposing the heartwood of the branches and tree trunk if left until later).

Likewise, once a reasonable lower clearance is achieved, trees that need to fit under power lines should start to be trained as soon as possible. They should not be left until they are amongst the wires. If pruned early and well under the wires a better shape can be achieved with increased branching that will enable the tree to be easily managed under the wires or provide far greater opportunity to train outer branches around the wires, if need be.

The dividends from such a program will be repaid ten-fold in the future via trees with better basic structures and health and requiring less pruning and intervention as they mature. This ultimately leads to less risks of failure due to defective parts that were easily removed when the tree was young (Gilman 2012).

Formative pruning, although straight forward in theory, does require individual assessment and decisions based on each tree's specific needs. It is both 'art' and 'science' and should be conducted by an experienced arboricultural professional and in line with AS4373 Pruning of Amenity Trees. Experiences from professionals such as Gilman indicate that in younger trees, foliage removal in the order of 40-50% is not an unacceptable figure and may be necessary in achieving the longer term desired outcomes. For older trees this should be reduced to 15-20% maximum.

The basic premise Council will follow is to 'prune early and prune often' until the desirable form of the tree is achieved formative pruning is not realistically achievable due to extreme pre-existing defects then it is far better to remove and replace the tree when it is young, rather than unrealistically expecting the defects to remedy themselves and then having to remove the tree in 10 years time or worse, remove the tree due to an otherwise preventable failure.

Some species are particularly pre-disposed to the formation of included bark branch unions at various points. This is most serious when it occurs in the major lower limbs and first order branch junctions. This type of union is often a weak branch attachment and is more inclined to failure as the tree matures. Larger and end-weighted branches are therefore prone to failure in heavy rains and strong winds. Trees such as Robinia that are inclined to such inclusions will not be as widely used however they can be managed to try and alleviate the issue and reduce the likelihood of any serious failures.

Mature Tree Pruning and On-going Management

Council will prune trees to maintain a reasonable and safe clearance between trees and pedestrians, vehicles and private property. Council has developed specific guidelines with regard to tree pruning for clearances and to maintain views and solar access. Refer to Figure 1.2 below for a diagram that graphically illustrates the proposed clearances and offsets for mature tree pruning. This is a guideline illustration only and actual clearances required will depend on individual site constraints.

Council will not typically prune a tree for the provision of views or creation of unreasonable solar or digital receiver access. Council will avoid pruning practices, which disfigure the tree or are detrimental to its healthy and safe condition.

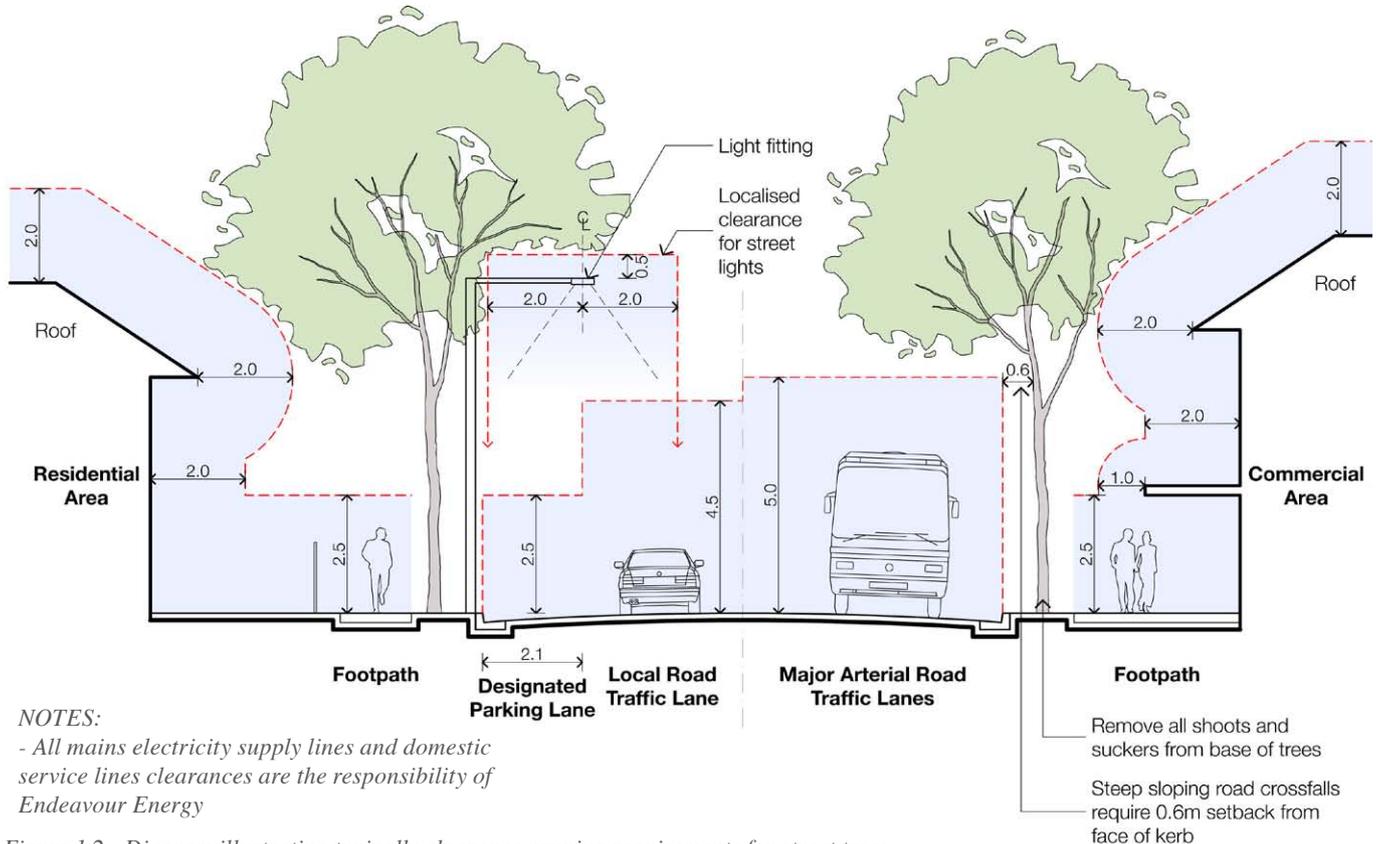


Figure 1.2 - Diagram illustrating typically clearance pruning requirements for street trees

When planting new street trees Council will consider the impact the mature tree may have on surrounding residents views and will, as far as practicable and reasonable, avoid planting overly large trees that will block pre-existing solar or digital receiver access.

If an existing tree is removed, any replacement tree will normally be similar in scale and form and will be planted in close proximity to the original tree. It will be allowed to reach its natural potential.

3.4 Tree Theft and Vandalism

In accordance with Clause 5.9 of the WLEP 2010 it is an offence to damage, prune or remove a Council street tree. Any persons found guilty of tree vandalism may be prosecuted.

Residents shall also not attach items to a street tree or use a street tree for unauthorised purposes. As an example residents must not:

- Attach signs, flags, bunting or banners to trees.
- Place wires, ropes or lights within the canopy.
- Erect tree houses or other structures within or around the tree.
- Attach swings or rope ladders etc.
- Cut or otherwise damage roots or trunks at ground level to undertake edging or gardens.

3.5 Tree Procurement

Considerable effort and resources can be spent in planting new street trees. This considerable effort can be wasted if the tree dies shortly after planting, or if the tree is supplied in a substandard form or condition that may ultimately lead to poor performance or the later development of serious structural defects and poor health. As outlined by authors such as Gilman (Gilman 2012), most tree defects that occur in mature trees were present and identifiable at the time a tree

was initially planted. It is therefore essential that the tree and its roots be in optimal condition when delivered and planted.

An important aspect of the implementation of this plan will be to also improve the way Council plans for, and procures its nursery stock. Implementing a more 'forward-thinking' and pre-planned approach to plant procurement has numerous benefits, which include:

- Securing favourable contract growing prices.
- Ability to prepare and coordinate planting at optimum times of the year.
- Ability to purchase trees of the required species and cultivars.
- Ability to purchase trees of the required sizes and dimensions and formatively pruned to suit street tree installation.
- Assurance of the required quantities, including allowance for replacements when necessary.
- Ability to inspect and demand high quality stock, free of defects above and below ground.

In summary, all trees to be provided to the Council should be part of an advanced plant supply contract with one or more reputable commercial suppliers and they should conform to the NATSPEC "Guide for assessing the quality of and purchasing of landscape trees" by Ross Clark 2003. The specifications outlined in Appendix 4.2 of the this plan detail the specific requirements for the supply and transportation of trees. Council should undertake inspections of the stock prior to, or upon delivery, and reject any trees that fail to meet these specifications.

Tree Sizes

Tree size at installation is a critical issue. Too small and the tree may take a very long time to reach a worthwhile size and is more susceptible to accidental damage and vandalism. The bigger the tree at installation the harder it is to install and the greater the cost to replace it if it is damaged. There needs to be balance between size and cost.

The following guidelines are proposed as part of this Plan. The sizes given are nominal container sizes and it is assumed that stock will be grown and supplied under the Natspec guide to purchasing landscape trees (Clark, 2003).

Container Volume	Height above container (m)	Calliper at 300mm	Clear trunk height (m)
45 Litre	1.9 - 2.3	30-35 mm	1.2
75 Litre	2.2 - 2.4	40-45 mm	1.4
100 Litre	2.4	> 50 mm	1.5
200 Litre	3.5	> 60 mm	1.5
300 Litre	4.2	> 70 mm	1.5
400 Litre	5.5	> 70 mm	1.5

4.0 Appendices

4.1 Tree Planting Checklist

The following page contains a checklist that should be completed by a Council representative or the planting contractor prior to the installation of each street tree to ensure the long term viability and protection of Council's assets.

4.2 Street Tree Supply and Installation Specifications

1. Technical Guidelines Overview

Planting trees within streets is a complex operation that can involve removal and reinstatement of existing pavements, excavation, disposal of spoil, supply and planting of the tree, mulching, and installation of final tree surrounds. When carried out on major roads, professional vehicle and pedestrian traffic control measures will be required including the potential scheduling of work in the early mornings or on weekends.

This considerable effort can be wasted if the tree dies shortly after planting and then must be replaced. It is therefore essential that the tree is in optimal condition when planted, and the methods of planting, protection and maintenance is of a high standard.

This part of the document outlines the required measures and requirements of Wingecarribee Shire Council with regard to street tree planting. This Section will act as a specification for the purchase, installation and maintenance of street trees for use by the Council itself, its chosen Contractors or any private developers required to carry out work in the public domain.

Key factors that shall be considered include:-

- Purchase of trees of the specified size and quality
- Tree installation specification - including size of tree pits, and soil and backfill provisions
- Street planting technical details
- Specification and installation of any required tree guards
- Maintenance requirements

2. Street Tree Supply Specification

2.1 General conditions and quality

All trees to be provided to the Council are to conform to the NATSPEC guide and "Guide for assessing the quality of and purchasing of landscape trees" by Ross Clark 2003. The following specification details the specific requirements for the supply and transportation of trees. Definitions for the terms used within this specification shall be in accordance with the NATSPEC guide.

Nursery stock shall meet design criteria for minimum dimensions, container size and shape, plant shape or special pruning requirements outlined in this document and the table below.

Container Volume	Height above container (m)	Calliper at 300mm	Clear trunk height (m)
45 Litre	1.9 - 2.3	30-35 mm	1.2
75 Litre	2.2 - 2.4	40-45 mm	1.4
100 Litre	2.4	> 50 mm	1.5
200 Litre	3.5	> 60 mm	1.5
300 Litre	4.2	> 70 mm	1.5
400 Litre	5.5	> 70 mm	1.5

2.2 Labelling of stock

Clearly label individual trees and batches with the species name and cultivar / variety / provenance if appropriate. The label is to withstand transit without erasure or misplacement.

2.3 True to type

The trees supplied and planted shall be the species, and variety or cultivar that the Council has specified.

2.4 Health and vigour

The trees supplied shall be healthy and vigorous at the time of delivery and planting. Supply trees with foliage size, texture and colour at the time of delivery consistent with the size, texture and colour shown in healthy specimens of the nominated species. Supply trees with extension growth consistent with that exhibited by vigorous specimens of the nominated species.

2.5 Pest and disease

Trees shall not be diseased or show evidence of pest attack that could affect the long term health of the tree or adjoining plantings. Supply trees with foliage and soil free from attack by pests and diseases. For Australian native trees with a history of attack by native pests (eg. *Ficus macrophylla* & *Eucalypts*), evidence of previous attack must be restricted to less than 15% of the foliage and there must be no actively feeding insects or evidence of fungi.

2.6 Injury

Supply only trees free from injury and wounds.

2.7 Self supporting

Supply only trees that are self supporting.

2.8 Stem taper

Supply trees where the calliper at any given point on the stem is greater than the calliper at any point higher on the stem.

2.9 Pruning

Trees are not to be pruned into a saleable shape just prior to shipment. All pruning shall be a clean-cut at the branch collar, no lopping or topping of trees is to be carried out and the diameter of any wound must not exceed 50% of the calliper immediately above the point of pruning.

Clean stem height: trees shall be supplied with a clean stem height of 35-40% of total tree height. For example a 5m tree is to be pruned to 2m maximum (clean stem height must not exceed 40% of total tree height).

Pruning wounds: Restrict fresh cuts (i.e recent, non-calloused) to <20% of total tree height.

Type: Ensure a clean-cut at the branch collar that complies with AS4373-2007:Pruning of Amenity Trees.

2.10 Crown symmetry

The symmetry of the crown is an important aspect of the presentation and appearance of the tree in the landscape. Difference in crown distribution on opposite sides of the stem axis must not exceed 20%.

2.11 Stem structure

Species with an excurrent form: Supply trees with a defined central leader and the apical bud intact. Trees that have had their leaders cut or damaged will not be accepted. Supply trees with a single stem roughly in the centre of the tree with any deviation from vertical <15°.

Species with decurrent form: Supply trees where the central stem is not divided at any point lower than the clean stem height nominated, and that the stem junction at the point of division is sound.

All species: Ensure that branch diameter is less than or equal to one-half of the calliper immediately above the branch junction.

2.12 Included bark

Supply trees where the branch/stem bark ridges at junctions

between stems and branches and between co-dominant stems are convex, except for species prone to include bark that are known to remain strong (as approved by Council).

2.13 Trunk position

Supply trees with the distance from the centre of the trunk to any extremity of the rootball is not varying by >10%.

2.14 Compatibility of graft unions

When purchasing named cultivars propagated by grafting, it is critical that the graft union is sound and that the scion and root stock are compatible. The union between the scion and the root stock must be sound for the entire perimeter of the graft. The diameter of the scion immediately above the graft must be equal to the diameter of the rootstock immediately below the graft (+or -20%).

2.15 Indication of north

Trees in containers >100 litres: Indicate the northerly aspect during growth in the nursery and ensure it is marked so to withstand transit without erasure or misplacement.

3.16 Root division

Trees in containers >45 litre: Primary division of roots is to have occurred within the outer 50% of the rootball at <100mm intervals.

2.17 Root direction

Ensure that roots, from the point of initiation, generally grow in outwards (radial) or downwards direction, and that any deviation from the established direction <45°.

2.18 Root ball occupancy

Soil Retention: On shaking or handling of the unsupported rootball at least 90% of the soil volume shall remain intact.

2.19 Rootball depth

Rootball depth assessment for containers/rootballs 45 litres or larger must:

- have a depth of less than or equal to the maximum depth specified for palms;
- have a diameter greater than or equal to their depth; and
- rootballs (regardless of size) must not exceed 550mm in depth (except for palms).

2.20 Height of root crown

Ensure that the trees root crown is at the surface of the rootball and free from suckering.

2.21 Non-suckering rootstock

Grafted cultivars/varieties: Supply trees grafted onto non-suckering rootstock.

2.22 Rejection of non-conforming specimens

Any tree not conforming to the specifications and standards listed in this specification shall be rejected and suitable replacements provided. If non-conforming trees are provided, the Council require new stock that complies to be supplied and planted, or alternatively may provide replacement specimens and deduct the costs from any applicable bank guarantee or bond.

3. Street Tree Installation Specification

3.1 General

This specification describes the appropriate techniques to be used to install new street trees within the Council local government area.

There may be allowance for some variation in the techniques

to be used, however any change to the techniques from those described here must be submitted in a Work Method Statement for approval by the Council prior to any work being carried out.

Tree planting works shall be undertaken by an Arborist or Horticulturist with minimum certification in accordance with Australian Qualifications Framework Level 2.

3.2 Typical scope of work

The scope of work for tree installation work typically comprises:-

- (a) Demolition of existing tree pit or cutting of the existing footway.
- (b) Excavation of subgrade for tree pits.
- (c) Supply and installation of imported and existing soil mixes.
- (d) Installation of trees.
- (e) Supply and installation of wooden stakes, ties and guys where required to maintain stability.
- (f) Installation of supplied tree guards where specified.
- (g) Supply and installation of various style tree bases, to the Councils specification, after an initial six (6) month soil settlement and tree establishment period.
- (h) Reinstatement of pavement in any aborted tree pits.
- (i) Maintenance of planted trees for a specified period following completion of planting.

3.3 Standards

All works shall be in accordance with the relevant standards.

The following standards are referred to in this section:-

- AS4419-2003 Soils for landscaping and garden use;
- AS4454-2003 Compost, soil conditioners and mulches;
- AS4373-2007 Pruning of amenity trees.

3.4 Statutory requirements

The installer is responsible for compliance with all relevant statutory requirements.

The installer shall apply for a Road Opening Permit and be able to demonstrate clear working programs and sequences. Site specific pedestrian and vehicular traffic control plans are to be submitted as part of this application and shall conform to NSW Roads and Maritime Services guidelines and any other statutory requirements. These plans shall include any requirements for parking of work site vehicles and the delivery of materials.

Approval from the NSW Police Traffic Management Centre and NSW Roads and Maritime Services may be required when the work has an impact on traffic flow on major roads.

3.5 Environmental controls

The installer shall ensure that all materials and the execution of the work are ecologically sound, environmentally benign and consistent with the principles of sustainable development.

The installer shall take all practical precautions to ensure that dust and noise caused by the works are kept to a minimum. The installer shall take all practical precautions to prevent the spread of dirt and mud along roads and paths. The installer shall be responsible for all localised sediment and erosion control of work and stockpiles under their control and use.

The installer must comply, and make sure that sub-contractors comply, with the general provisions of this clause and any other environmental protection provisions within the requirements of any statute, by-law, standard and the like related to environmental protection.

3.6 Inspections

Provide not less than 48 hours notice so that a Council Representative can make the following inspections:-

- (a) Tree stock prior to planting.
- (b) Plant materials set out and placed in tree pits before backfilling.
- (c) Tree planting completed.
- (d) Footpath reinstated.
- (e) Periodic inspections during maintenance period.
- (f) Completion of plant establishment period.

3.7 Site investigations, existing services and structures

The installer shall confirm with the Council the exact location of all tree pits associated with tree planting works.

In accordance with NSW electricity and gas supply regulations, all excavations for tree planting require the review of underground service plans sourced from Dial Before You Dig service. Specialist service location tools or expertise may be required when underground service plans are insufficiently detailed or where plans indicate that services are close to the intended planting location. The installer shall be responsible for the rectification of all pavement surfaces where inspections have been undertaken including the making good of any excavation or site markings.

The installer shall notify the Council immediately upon discovery of services or obstructions that prevent any planned tree planting. All services shall be considered live until determined otherwise. No liability is accepted, by the Council or the Service Authorities, for accidents resulting from contact or disturbance to services.

In the event of any damage to any service, the installer shall immediately notify the relevant authority and the Council and satisfy all requirements of the authority concerned.

The installer shall be liable for all damage caused by the tree installation works to all existing buildings and structures. The installer shall make good all damage at their expense.

3.8 Spoil

Surplus excavated material must be immediately removed from the site. This includes debris resulting from site clearance and excavated material not reusable as topsoil, filling, mulch or the like, unless otherwise specified or directed. Existing topsoil with any stump grinding debris incorporated within it will be removed from site and not re-used in the new planting site.

The installer shall be solely responsible for the safe and harmless disposal of material away from the site. Surplus excavated material shall not be permitted to remain in place overnight.

Existing tree base materials, such as unit pavers or stone tiles, can be recycled and reused in the new tree bases as long as specifications allow.

3.9 Extent of excavations

Excavate to an equivalent depth of the new tree rootball measured from the underside of any concrete base slabs, or as shown on the details. Do not disturb services, and excavate by hand around any existing services as required.

The installer shall measure the rootball depth of each tree to determine the appropriate tree pit depth. Allow additional depth to achieve specified falls for subsoil drainage lines and to satisfy finished levels.

Safety precautions must be in place to prevent public entry to

work site area.

3.10 Existing pavement

The existing pavement shall be cut by a road-saw or other suitable tool to the dimensions shown in the details. Cutting shall only be at right angles and parallel to the kerb. The cut shall have a neat straight edge and smooth face. Kerbs must not be cut under any circumstances. In the case of cutting unit paving, ensure that the cuts are made along the joints without damage to the surrounding pavers. Unit paving may be dismantled rather than cut if this option minimises damage.

3.11 Subgrade preparation

Cultivate or rip the subgrade at the base and sides of tree pits to a depth of 100mm. During cultivation, thoroughly mix in any materials required to be incorporated into the subsoil. Remove stones exceeding 70mm and any rubbish or other deleterious material brought to the surface during cultivation. Grade the base of tree holes to the required design levels and shapes after cultivation.

3.12 Root control barriers

Root barriers will typically not be required, and shall only be installed when specifically instructed by the Council.

3.13 Soil mixes

TYPE A Soil mix: Commercially available premium grade manufactured sandy loam organic garden mix conforming to AS4419

TYPE B Soil mix: Blended soil mix comprising 50% recovered existing site topsoil (or imported premium grade 'low organic' top soil) and 50% Type A.

COURSE SAND: Shall be washed, sharp coarse river sand 0.25 to 2.0mm in diameter, free of weeds, debris or other deleterious material.

3.14 Soil stockpiling

Do not establish stockpiles of soil on the site. All materials are to be moved directly from carrier to the hole. The pavement surface is to be maintained in a clean and tidy state at all times.

3.15 Soil testing

Upon excavation, if the tree site appears to show poor subterranean condition (poor drainage, contamination, or anaerobic conditions), the installer shall immediately notify the Council. Site specific soil testing or subsoil drainage may be specified and approved.

3.16 Drainage

Subsoil drainage is to be installed as per Council requirements and will be determined on a site by site basis.

3.17 Bad ground

Bad ground shall be ground considered unsuitable for the purpose of the works, including filling liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances or ground which is, or becomes soft, wet and unstable and the like.

If bad ground is encountered in, or adjacent, to any tree pit during the work, notify the Council immediately and obtain instructions before carrying out any further work in the affected area.

3.18 Planting conditions

Do not plant in unsuitable weather conditions such as extreme heat, cold, wind or rain. Avoid planting where unseasonable and adverse weather is forecast within 24 hours of the operations.

No trees are to be planted on days exceeding temperatures of 30° Celsius. Generally tree planting is preferred during the cooler months from March to August (autumn and winter).

3.19 Watering

Thoroughly water the tree rootballs before planting and then immediately after planting. Prevent the rootballs from drying out during the transportation or planting phase.

Apply water so as not to disturb the soil. Raise the moisture within the root zone to field capacity. Ensure potted rootball is thoroughly wet through the entire soil profile. Continue watering at a rate and frequency as required to avoid water stress in the plant.

3.20 Lifting of trees

It is preferred that all trees are carried or slung via the root ball. In the event that the trees have to be repositioned or lifted by the trunk, the installer shall provide adequate soft padding to the trunk in the form of underfelt, carpet or rubber wrapping and use only soft slings during the lifting. Serious damage to the cambium tissue of the stem as a result of poor lifting techniques will require replacement of the tree.

3.21 Placement

When the tree pit is excavated and the hole is the correct size, place the rootball in its final position. Ensure the trees are centred and plumb and the top of the rootball level with the finished surface of the surrounding soil mix.

Do not use the trunk of the tree as a lever in positioning or moving the tree in the planting hole.

3.22 Alignment and orientation

Position the tree at the setout distances as indicated in the details. Ensure trunks are set vertically and aligned with other new or existing trees.

Orientate the trees trunk north where indicated by supplied markings where applicable. (+or- 20°). Adjust within the above tolerances so that the primary lowest branches are generally aligned parallel with the kerb and road way (NOT extending out into roadway).

3.23 Root trimming

All trees shall have the outer 10-25mm of the external root ball faces pruned or sliced away using secateurs. Avoid excessive disturbance to the remaining rootball during this trimming and discontinue if excessive rootball soil begins to fall away. Do not leave the rootballs exposed for extended periods. Cover the rootball with moist hessian if backfilling can not occur immediately.

3.24 Backfilling

Backfill with soil mix as specified in soil mixes and in accordance with the details and specification. Lightly compact the soil to ensure all voids around rootballs are filled and that no air pockets are retained.

Ensure that the backfill soil is not placed over the top of the potted rootball. The top of the rootball and plant stem must be kept level with the top of the backfill.

3.25 Mulch

Mulch shall be free of deleterious and extraneous matter, including soil, weeds, rocks, twigs and the like. Lay mulch to maximum 80mm depth. Place the mulch so that it is not in direct contact with the trunk. Feather mulch away from trunk at base of root ball. (Refer standard details)

Mulch the areas in accordance with the details. The mulch

types to be used are as follows:-

- Decomposed granite brown colour, lightly compacted and installed as shown in the relevant standard details.
- Weed free timber chippings or recycled (no fines) wood waste.

4. Tree Establishment and Maintenance

4.1 Tree establishment period

The tree establishment period commences at the date of practical completion for a period specified by the Council.

All trees shall also be maintained immediately following their installation, as per the specifications below, up until the above tree establishment period commences. Tree maintenance works shall be undertaken by an Arborist or Horticulturist with minimum certification in accordance with Australian Qualifications Framework Level 2.

The installer shall submit a program prior to the commencement of the tree establishment period. The program shall detail all works required during the planting establishment period including:-

- (a) Rectification of defects;
- (b) Provision of materials;
- (c) Watering;
- (d) Fertilising;
- (e) Control of weed growth;
- (f) Replacement of dead, damaged or stolen plants.

The installer shall provide 7 days notice of any works to replace trees as part of planting establishment. Throughout the tree establishment period, the installer must continue to maintain new trees and carry out maintenance work including, but not limited to:-

- weeding and rubbish removal from tree surrounds;
- fertilising;
- pest and disease control;
- replanting (on approval from Council);
- adjustment, removal or replacement of stakes & ties;
- formative and selective pruning to AS 4373 and;
- mulching to maintain and reinstate to depth specified.

Watering - Allow for 10% of the planted container volume to be applied every 2 days for the first 2 weeks and then 20% of the container volume once per week for 3-4 months. Despite above guideline, installer is to monitor and maintain soil moisture during summer months ensuring the rootball does not dry out and causes wilting. Ensure the bottom of the tree planting hole does not become saturated. (The above is based on spring to early autumn planting – the above frequency may be halved for winter plantings).

Inspection results and the maintenance procedures shall be recorded and submitted to the Council every 2 months. The various ongoing maintenance practices shall be carried out to the satisfaction of Council.

4.2 Tree guards and supports

The installer shall supply and install 3 wooden stakes with hessian ties per tree, for all trees planted up to 200 litre in size. Where advised by the Council, the installer shall allow to supply and install metal tree guards and grates on specified trees.

When trees are installed within grassed surrounds, plastic collar guards are to be installed regardless of being mulched.

4.3 Fertilising

The following table details the required fertiliser program.

Timing	Product and application rate
At time of planting	Slow Release landscape fertiliser suitable for trees and shrubs, 9 to 12 months release time. Osmocote or approved equivalent applied according to manufacturers directions.
6 months after planting and then monthly through to the end of the plant establishment period.	Organic liquid fertiliser. Seasol or approved equivalent applied to soil as per manufacturers directions.

4.4 Aeration or watering pipe

Only where detailed, the aeration pipe will be 50mm slotted 'Ag-Pipe'. These will be without a geotextile sleeve. Any surface grates will be separately specified by Council, where necessary.

4.5 Tree bases

Tree bases surrounded by permeable pavements or flagging etc. shall be left as soil or filled with a thin layer of decomposed granite for the first six (6) months to allow for any settlement of the rootball and backfill soil.

Following the six (6) month settlement period, the tree base as specified in the detail is to be installed.

The tree base is to be maintained in a safe and level condition at all times.

Failure of the tree bases prior to agreed practical completion timing will require rectification by the installer. This failure equates to any area of the tree base slumping/lifting/cracking or creating a trip hazard (variation of more than 10mm) and will require rectification by the installer.

4.6 Pavement rectification

Reinstate and make good to match exactly the surrounding pavement, to the satisfaction and approval of the Council, all pavement, paving, concrete, brick or other surface damaged or affected by the tree planting and tree base installation works.

Existing materials salvaged from the site must be approved by the Council for reuse and must match existing pavement. Where temporary asphalt topping is required, approval of the Council shall be sought.

4.7 Tree replacements

Where trees are damaged or die or fail to maintain vigorous growth typical of the species due to neglect or inadequate maintenance, the installer shall replace, replant and maintain trees of the same species, size and quality.

4.3 Typical Street Planting Details

Technical details have been developed to ensure Council staff, developers and Council's Contractors provide an appropriate and consistent treatment for all street tree planting throughout

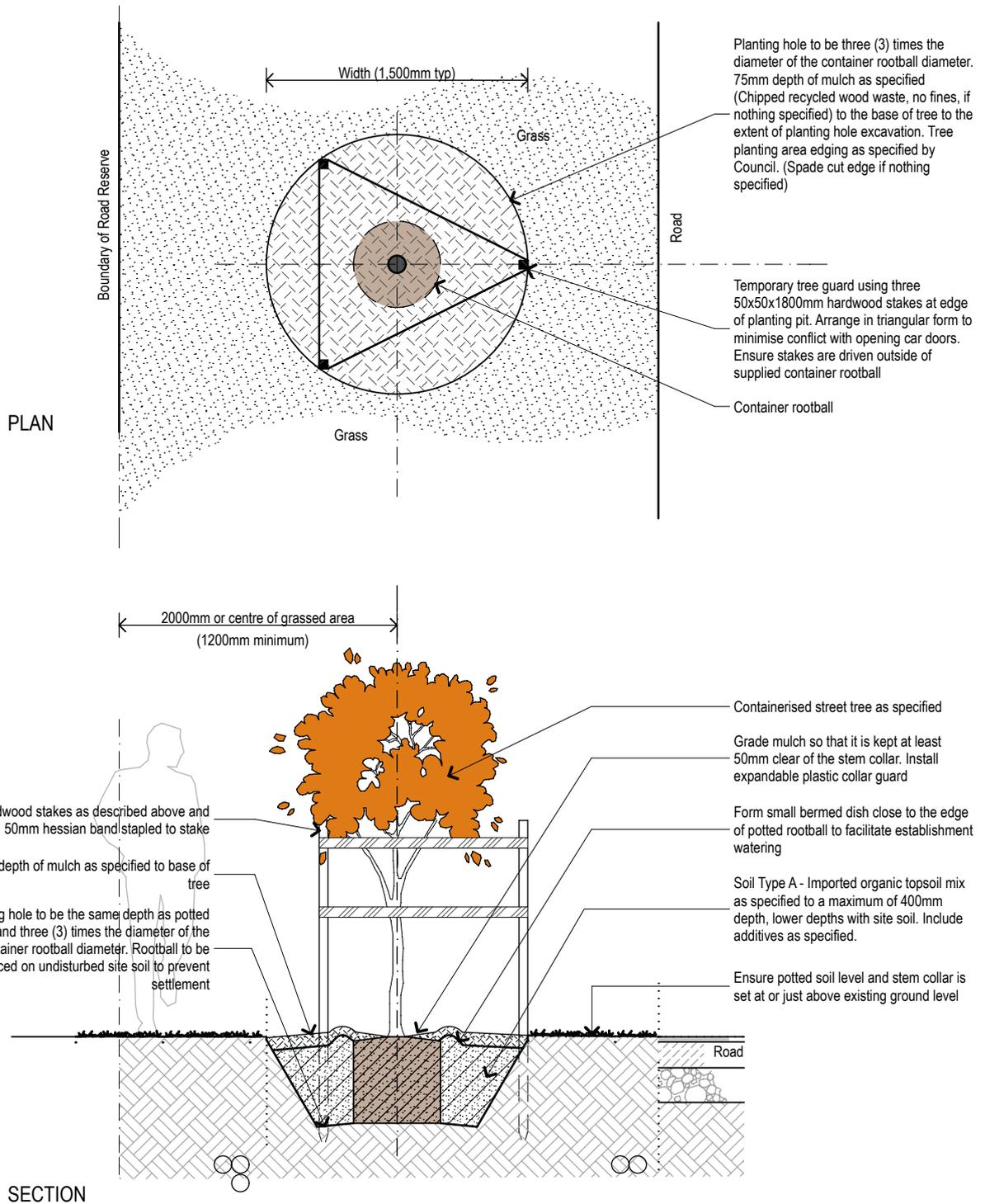
the variety of street environments typically encountered.

In-road planting details and median strip details will be dependent on the individual street widths, traffic and services and will therefore require site specific designs to be employed, however the following 'ideal practice' details have been included here to provide general expectations for tree planting in these instances.

The use of continuous planting trenches, structural soil, structural cells, suspended pavements and other tree planting technology will be considered based on specific site conditions. Actual designs shall be developed by Council or submitted to Council for consideration prior to any installation.

Refer to the following pages for the standard street tree installation and planting details to be typically applied to all normal street planting within the Wingecarribee Shire Council LGA area. These details may be amended by Council, from time to time, to accommodate any site specific circumstances.

NOTE:
All details are to be read in conjunction with any site specific DA conditions, Council issued Contract Documentation or relevant general specification clauses.

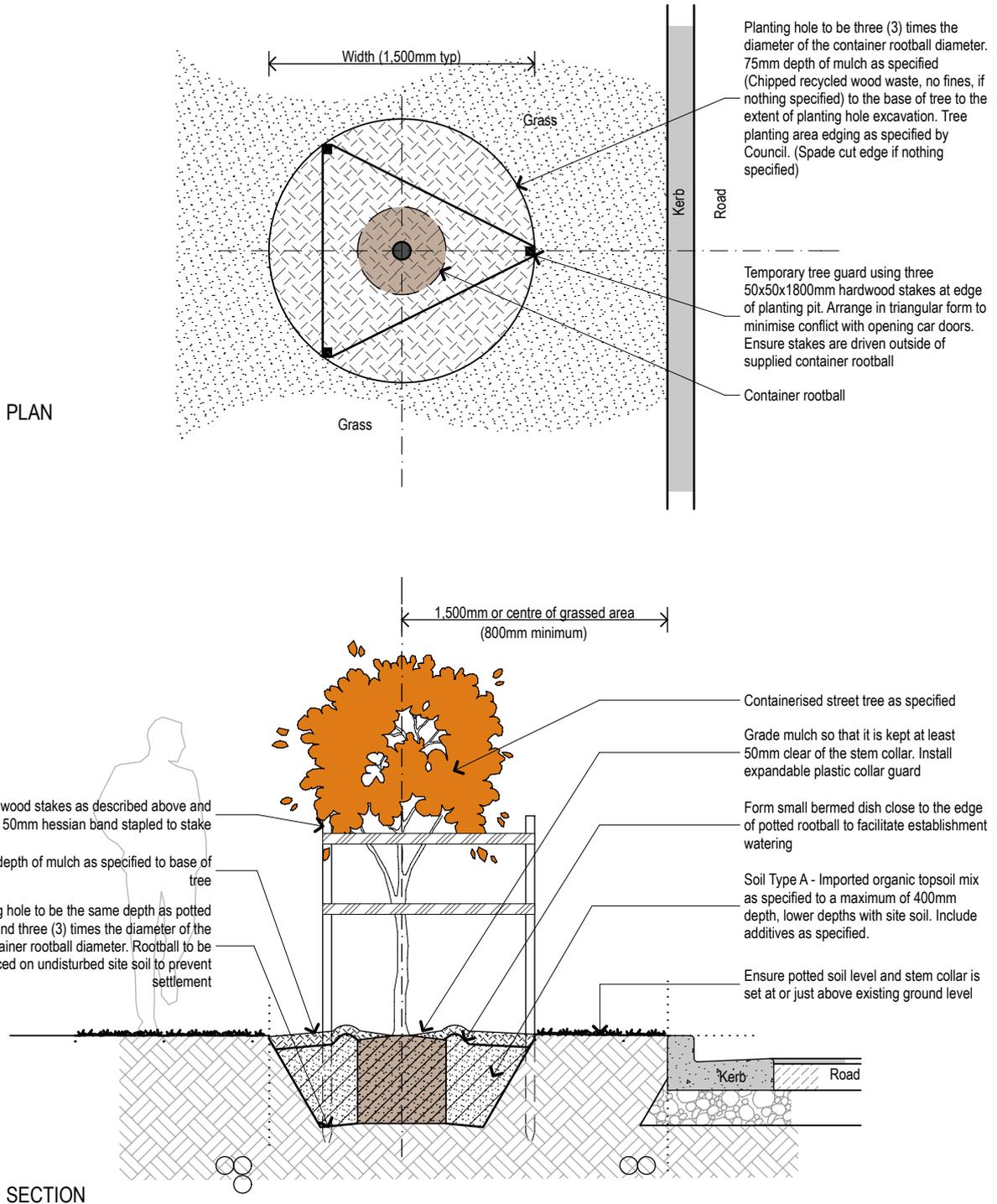


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Wingecarribee Shire Council

DETAIL 1 - TREE PLANTING IN GRASSED VERGE WITH NO KERB

NOTE:
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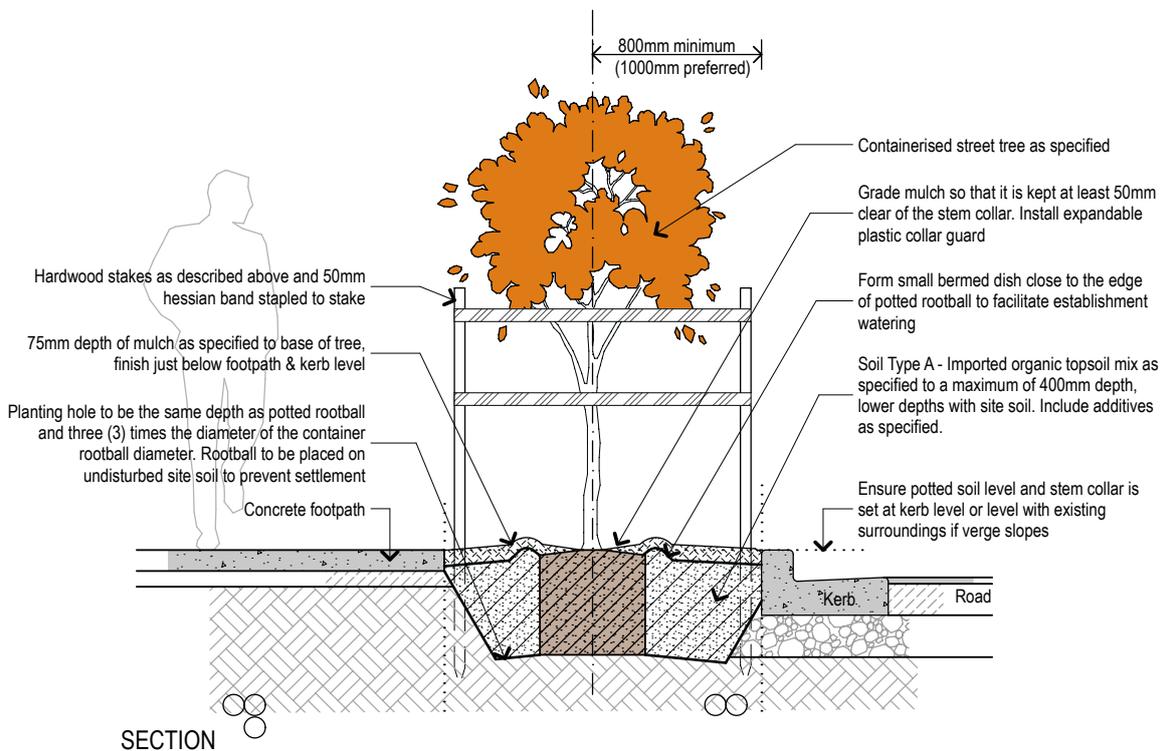
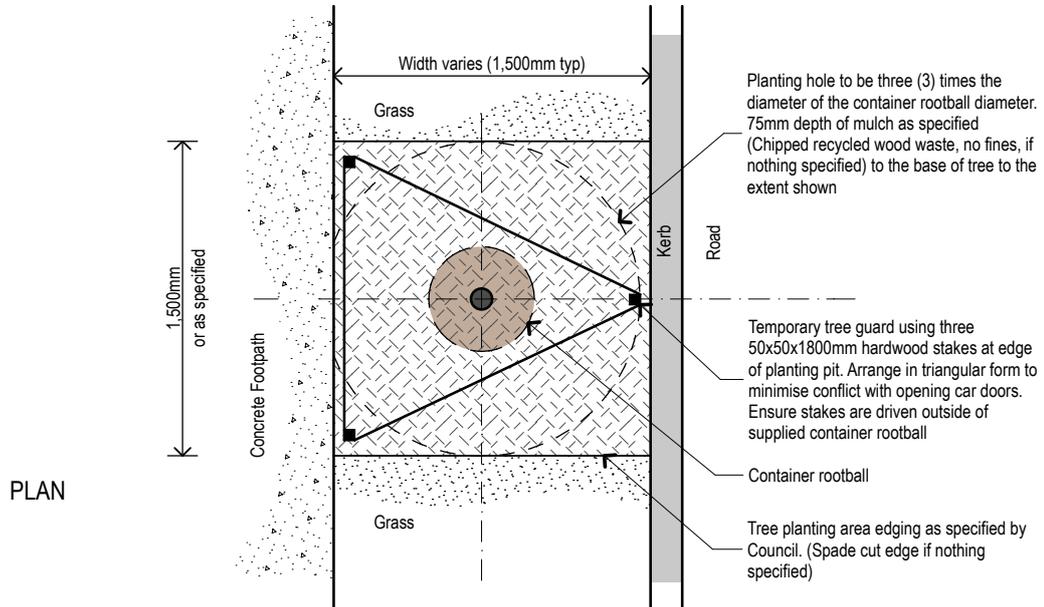


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Wingecarribee Shire Council

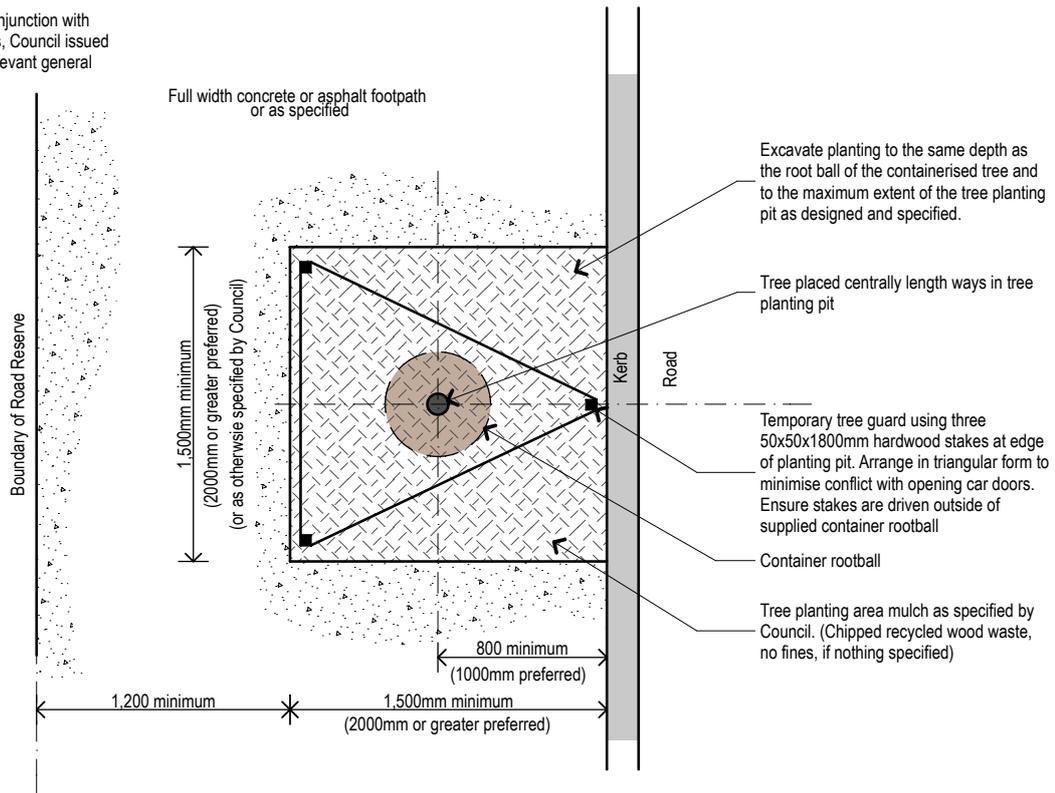
DETAIL 2 - TREE PLANTING IN GRASSED VERGE WITH NO PATH NEARBY

NOTE:
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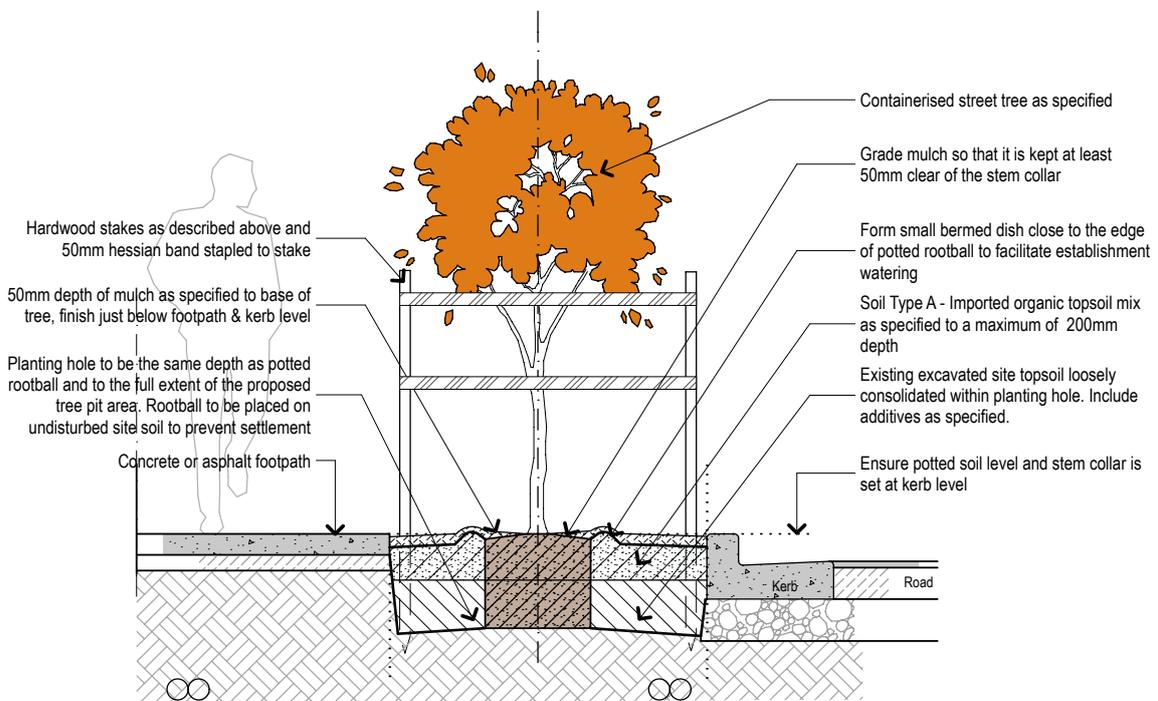


Scale 1: 25 @ A3 0 500 1000mm

NOTE:
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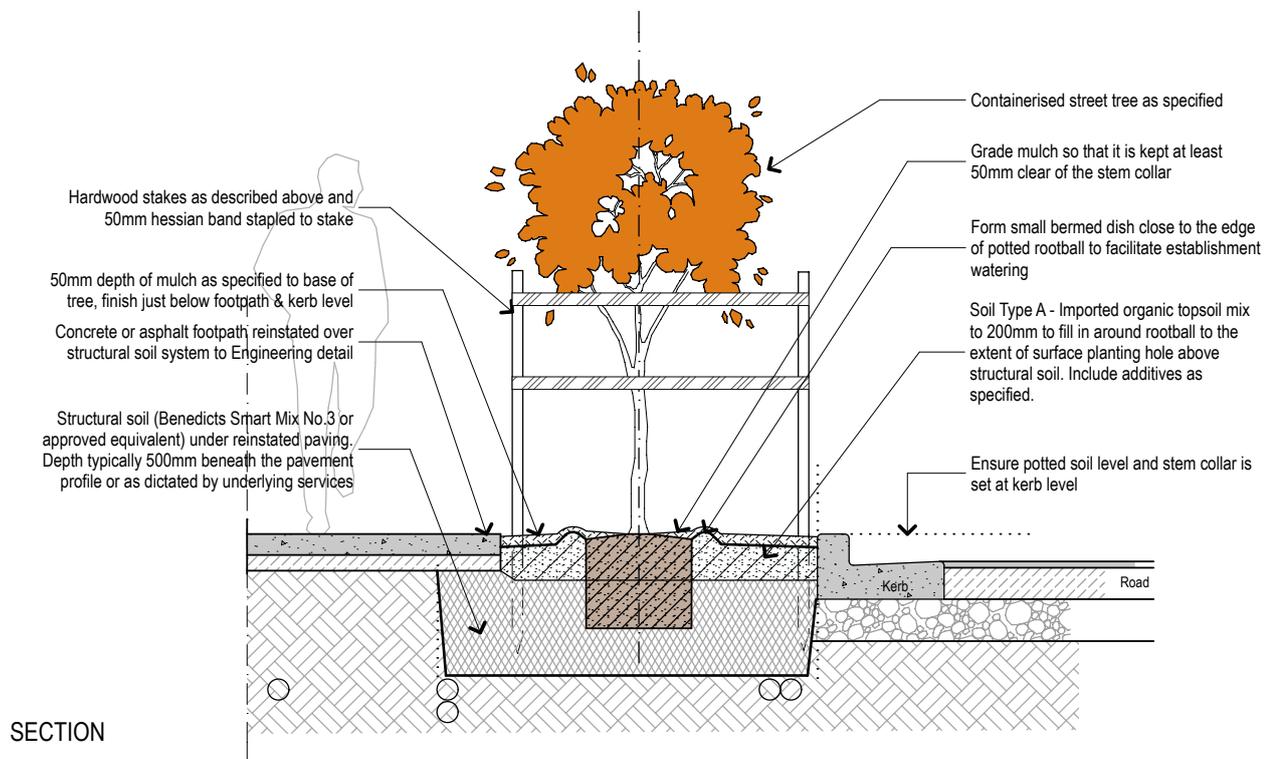
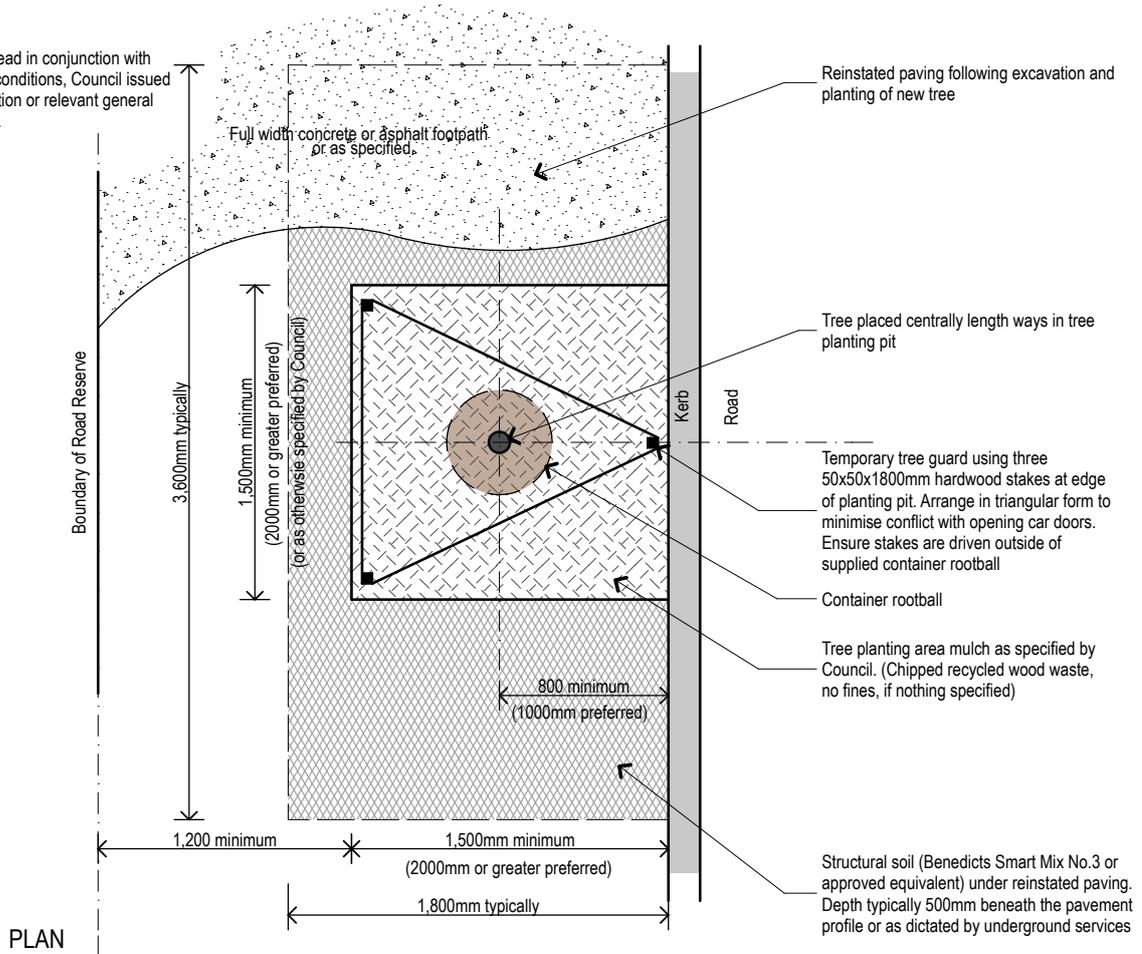


SECTION

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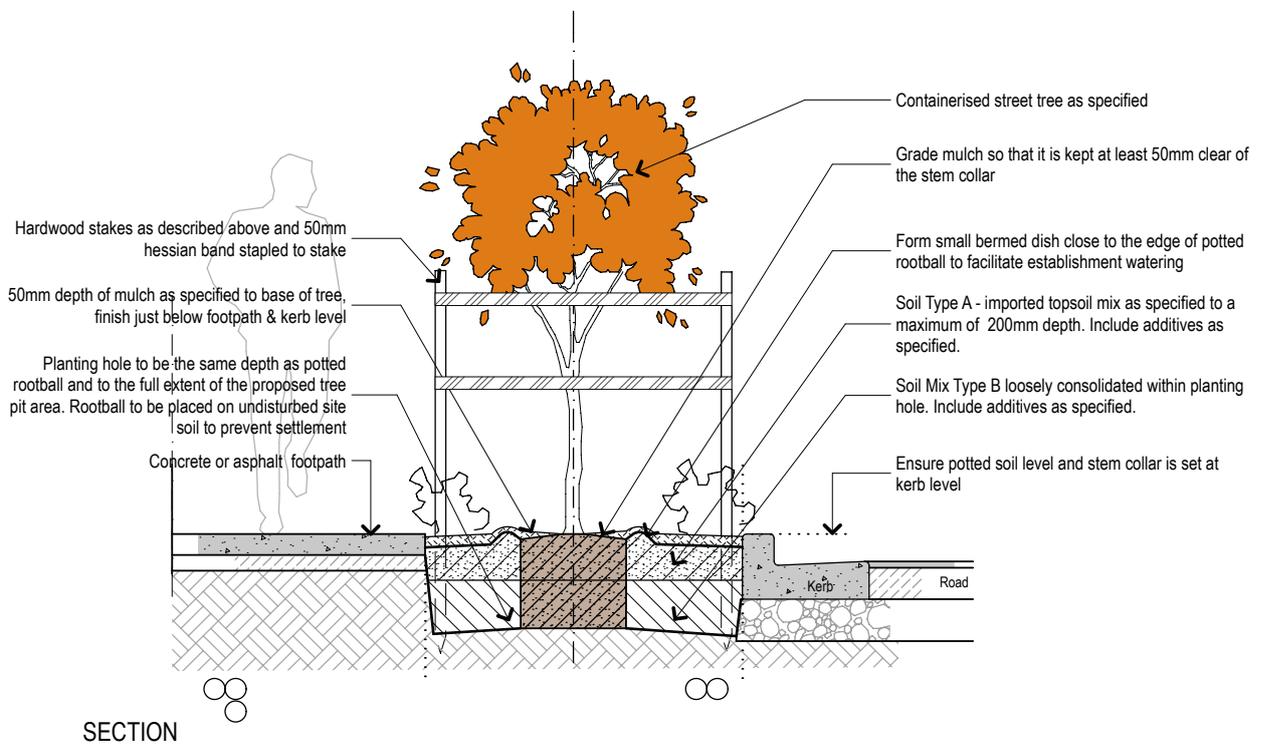
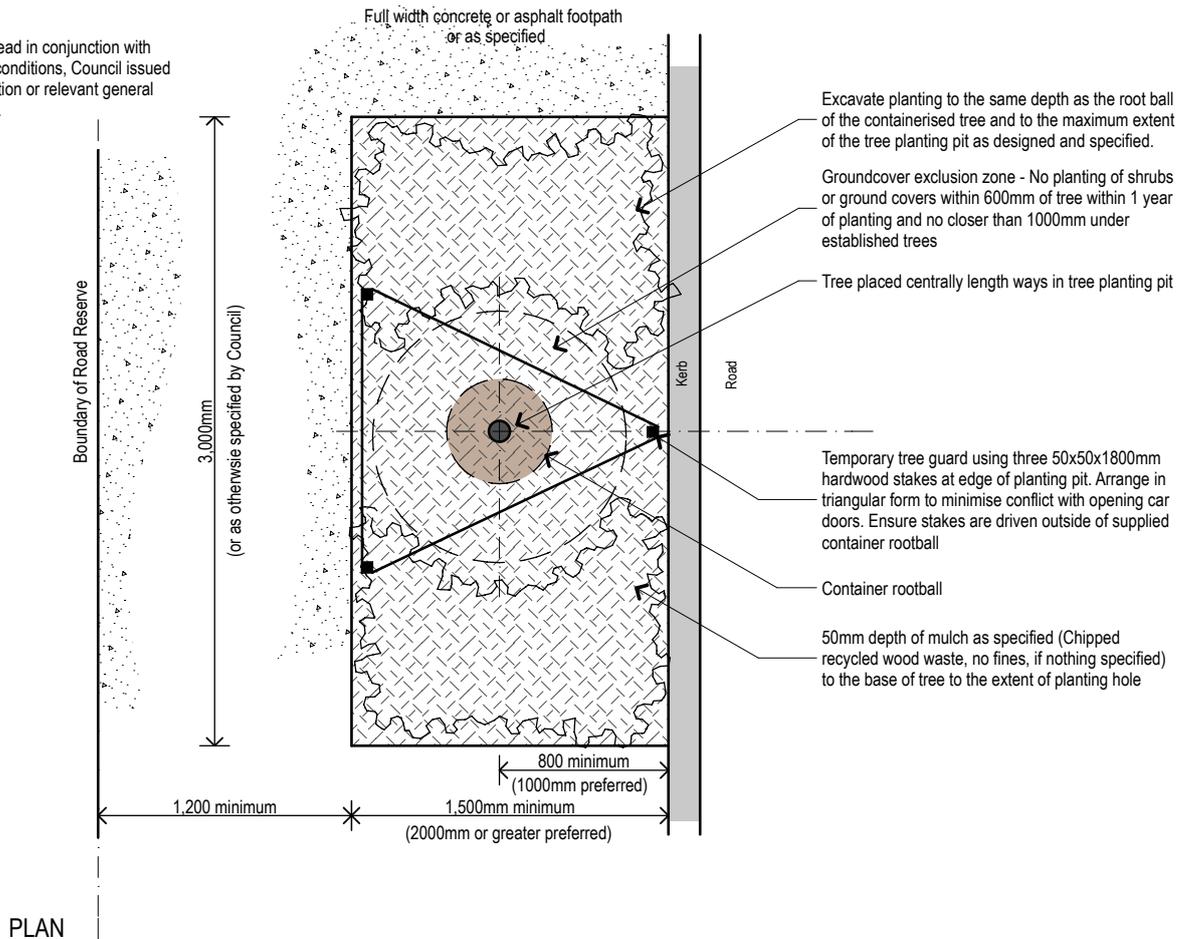
NOTE:

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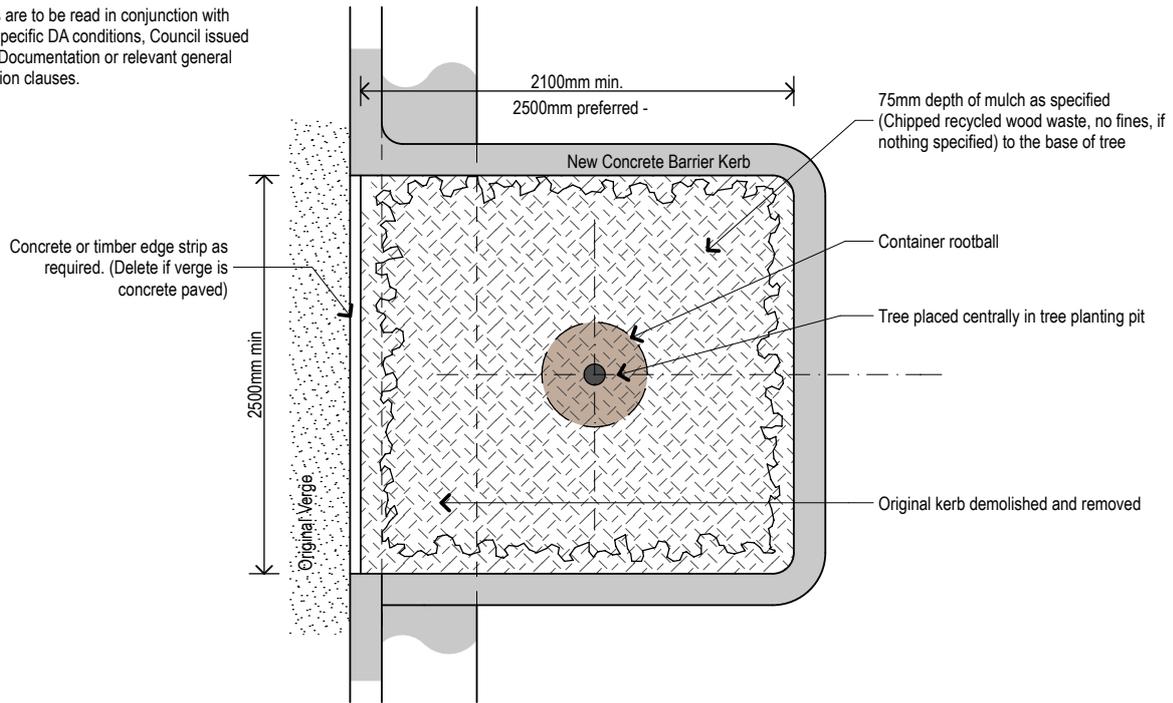
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NOTE:
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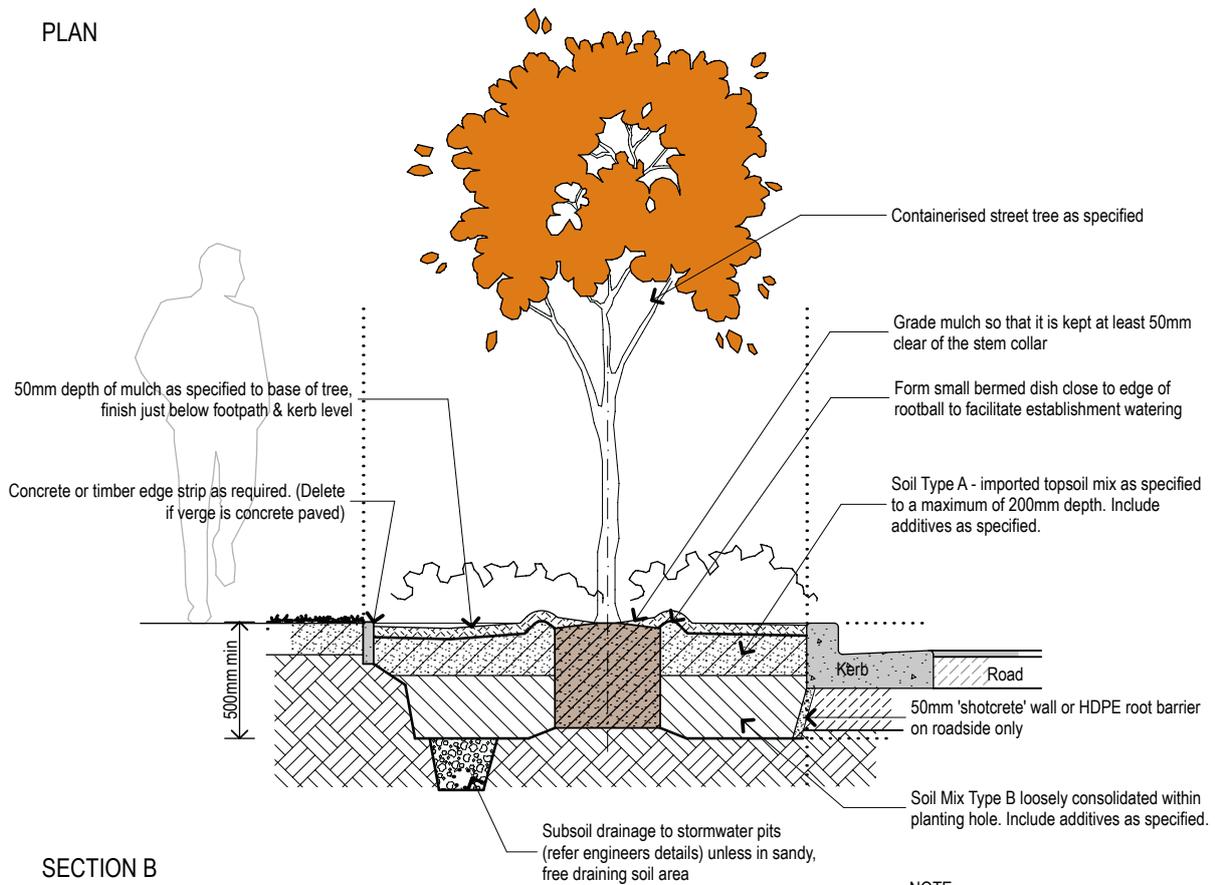


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NOTE:
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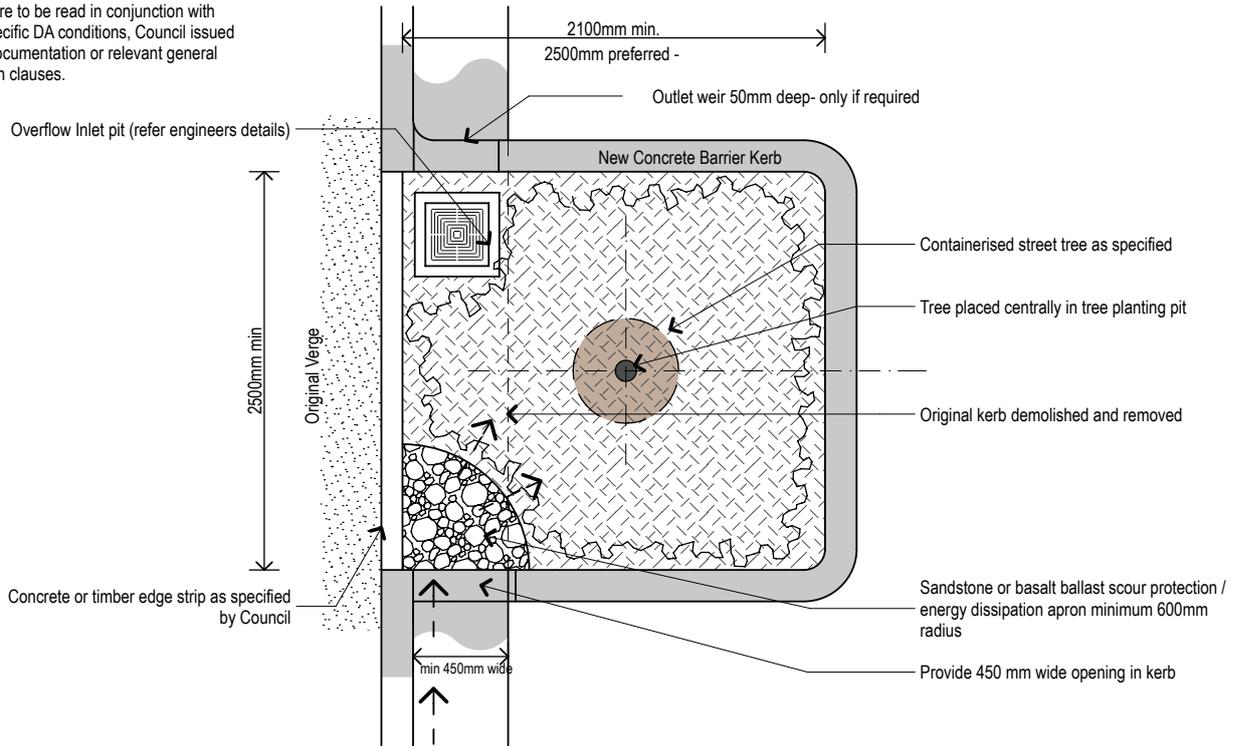


SECTION B

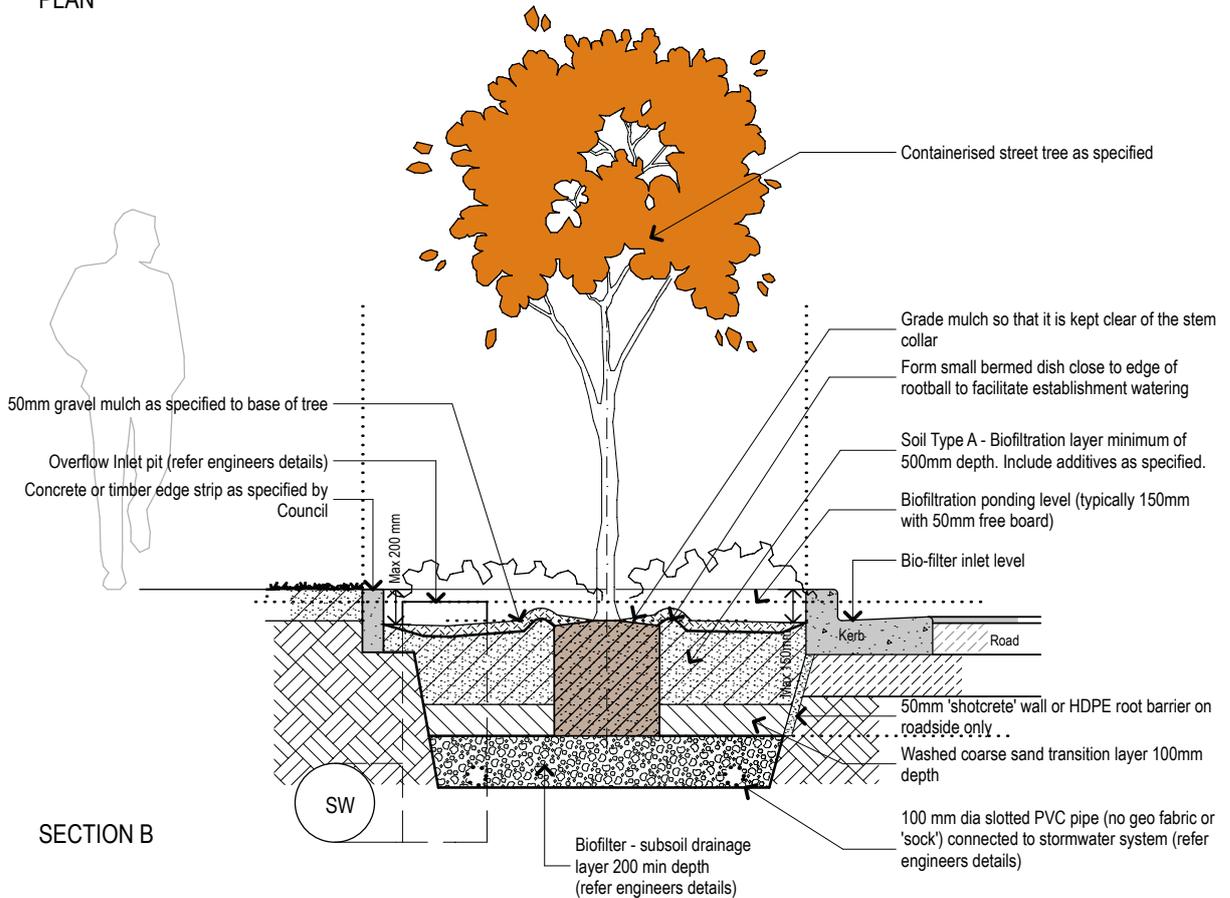
NOTE:
All blister and kerb extension details are to be verified for adequate drainage and existing gutter stormwater discharge on a case by case basis.

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NOTE:
All details are to be read in conjunction with any site specific DA conditions, Council issued Contract Documentation or relevant general specification clauses.



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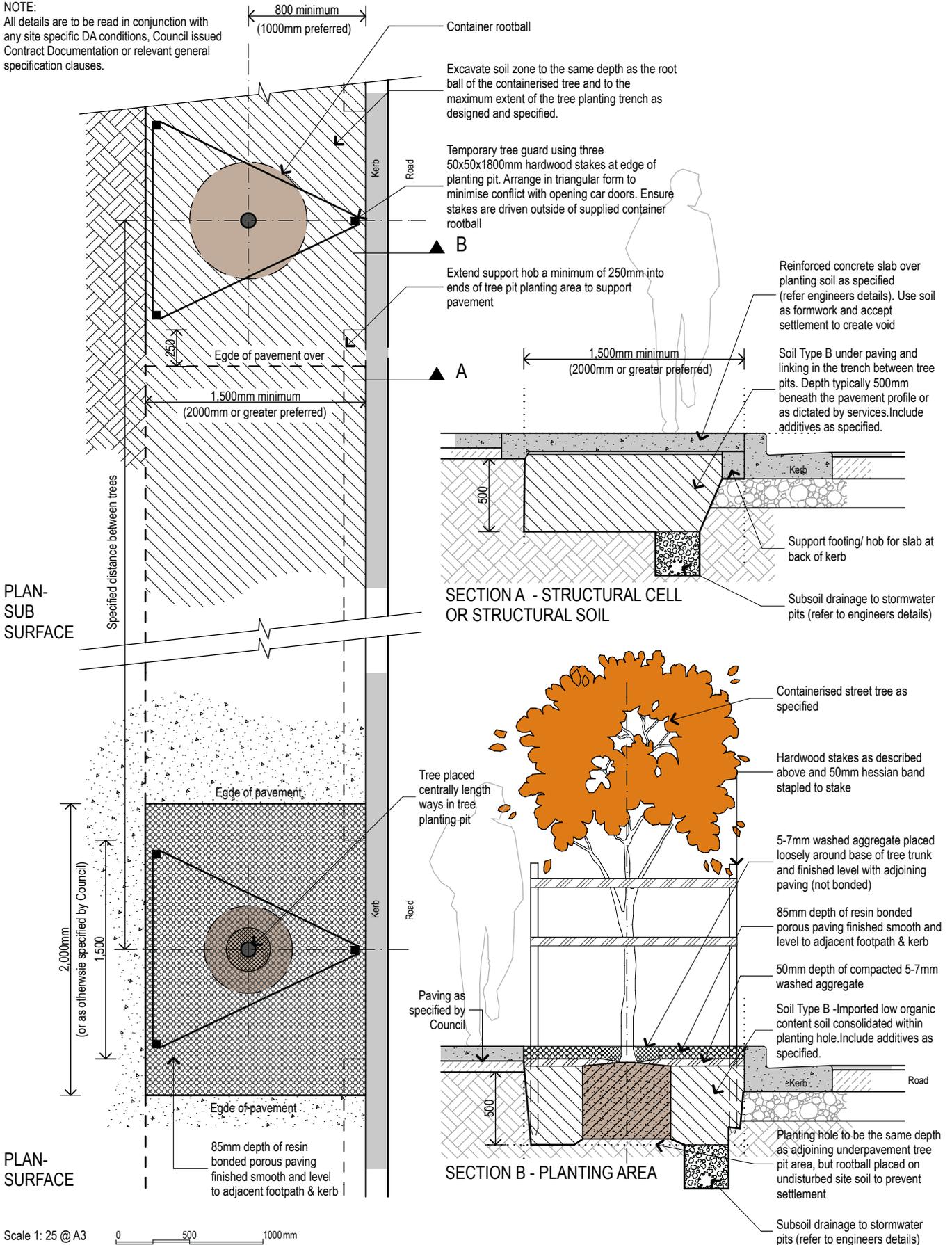


SECTION B

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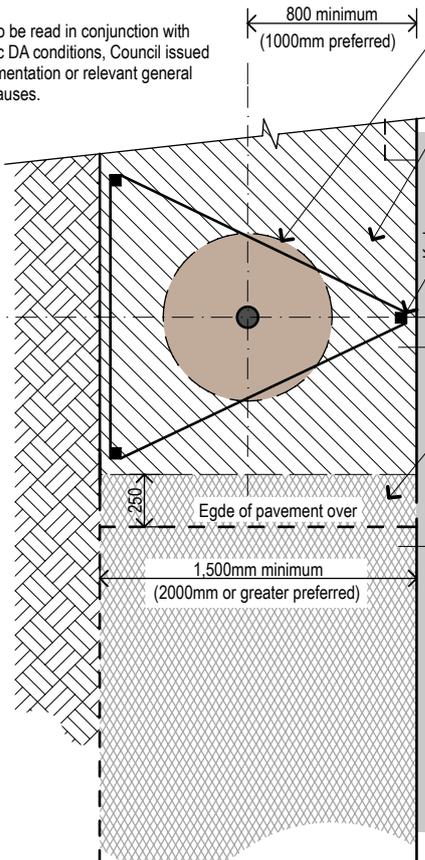
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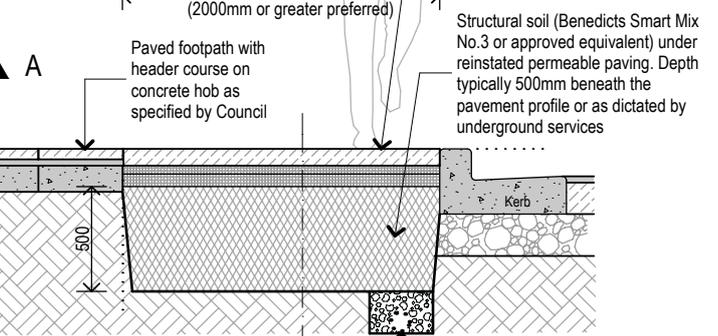
NOTE:
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PLAN-SUB SURFACE



Container rootball
Excavate soil zone to the same depth as the root ball of the containerised tree and to the maximum extent of the tree planting trench as designed and specified
Temporary tree guard using three 50x50x1800mm hardwood stakes at edge of planting pit. Arrange in triangular form to minimise conflict with opening car doors. Ensure stakes are driven outside of supplied container rootball

Extend structural soil a minimum of 250mm into ends of tree pit planting area to support pavement edge
Ecotrihex permeable paving (or approved equivalent) on 40mm depth of 2-5mm washed aggregate and 60mm of 20mm washed aggregate (no-fines) base. Infill joints with 2-5mm washed aggregate. No filter fabric between layers.

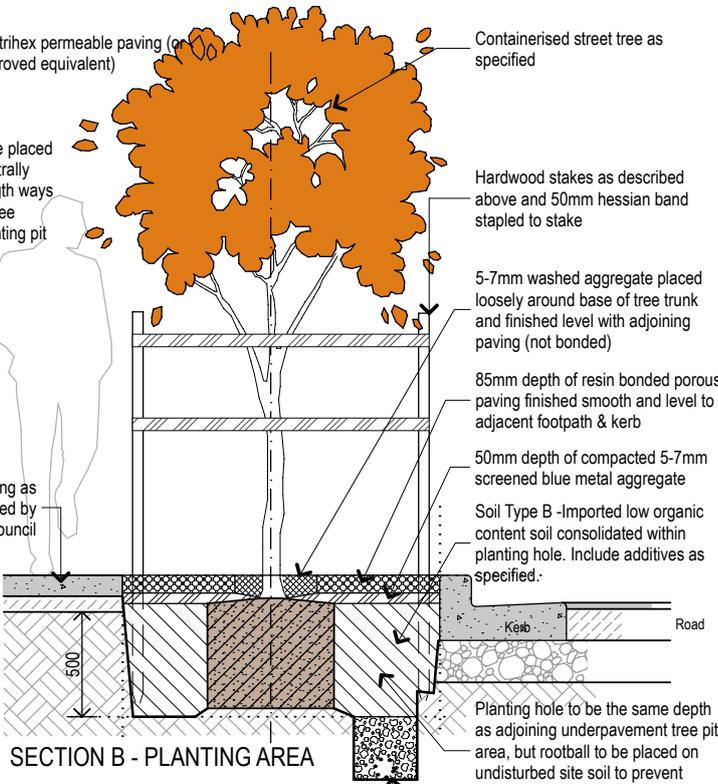
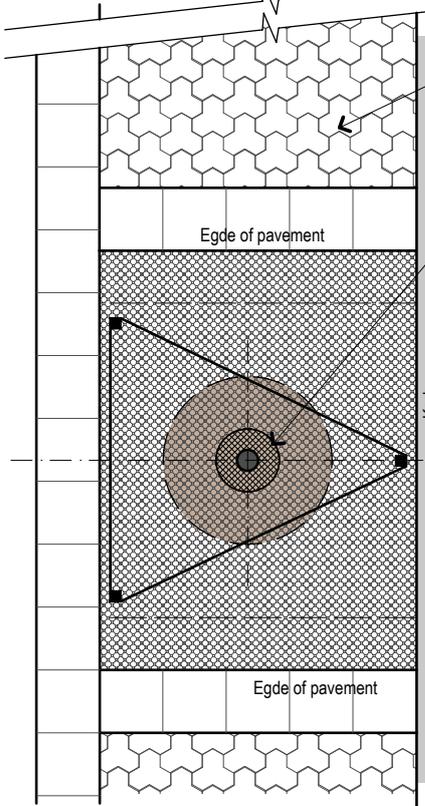


SECTION A - STRUCTURAL CELL OR STRUCTURAL SOIL

Specified distance between trees

2,000mm (or as otherwise specified by Council)

PLAN-SURFACE



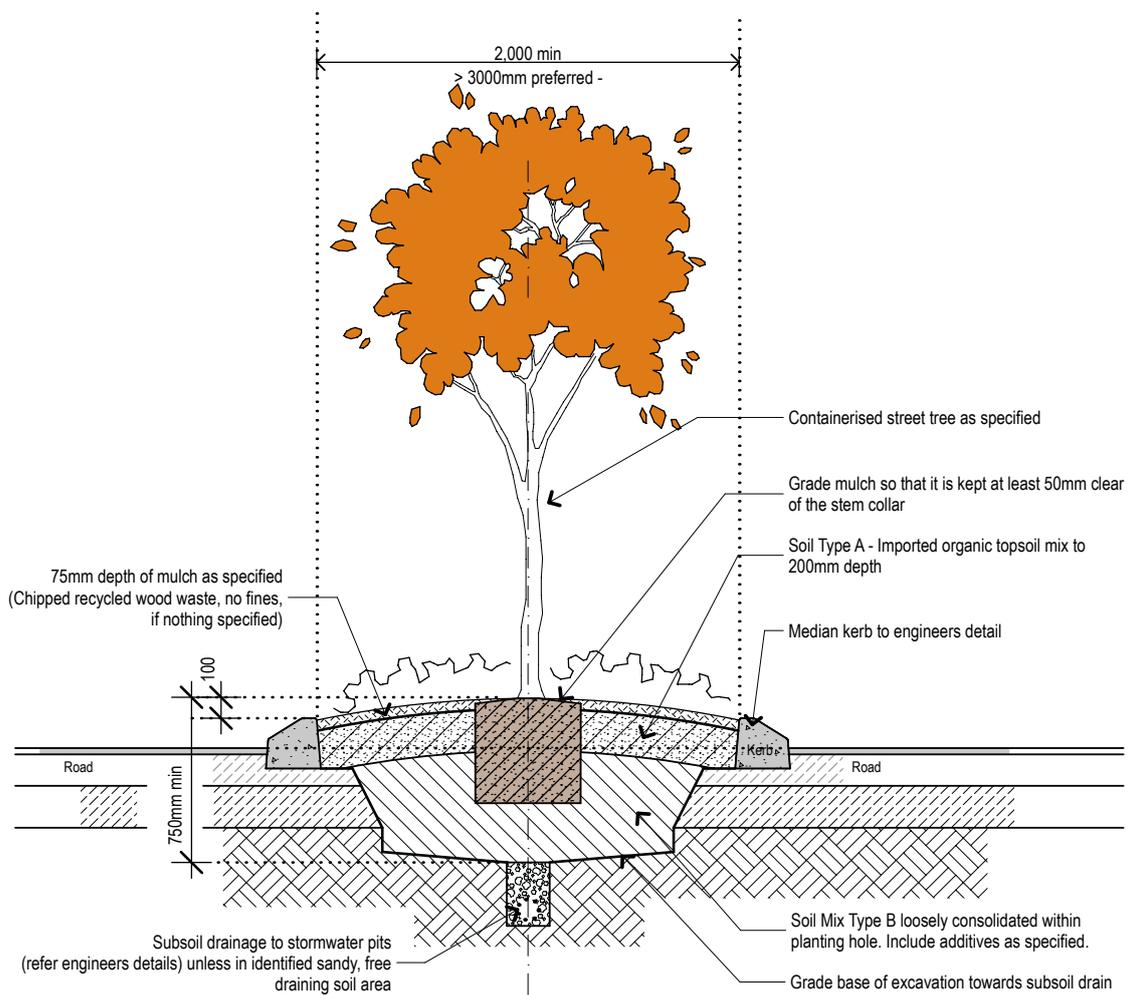
SECTION B - PLANTING AREA

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Wingecarribee Shire Council

DETAIL 10 - 75-200L TREE PLANTING IN PERMEABLE PAVING WITH STRUCTURAL SOIL

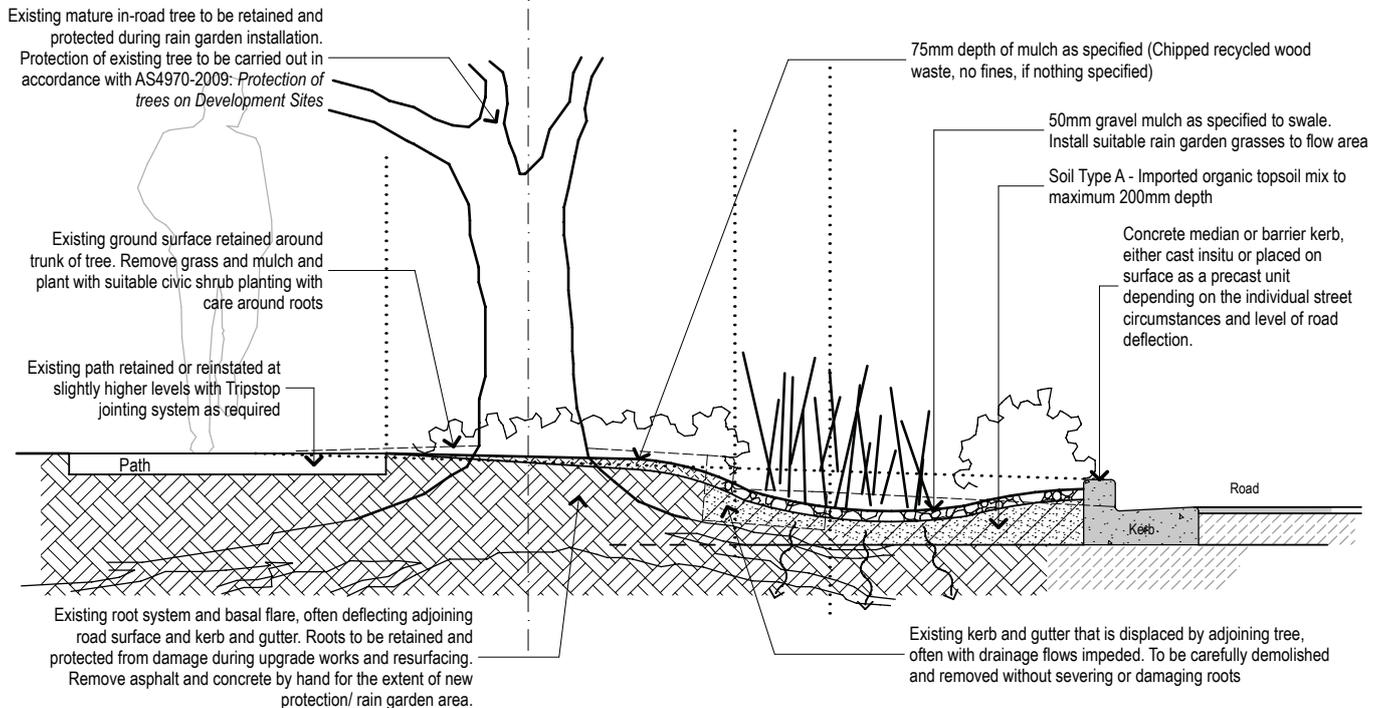
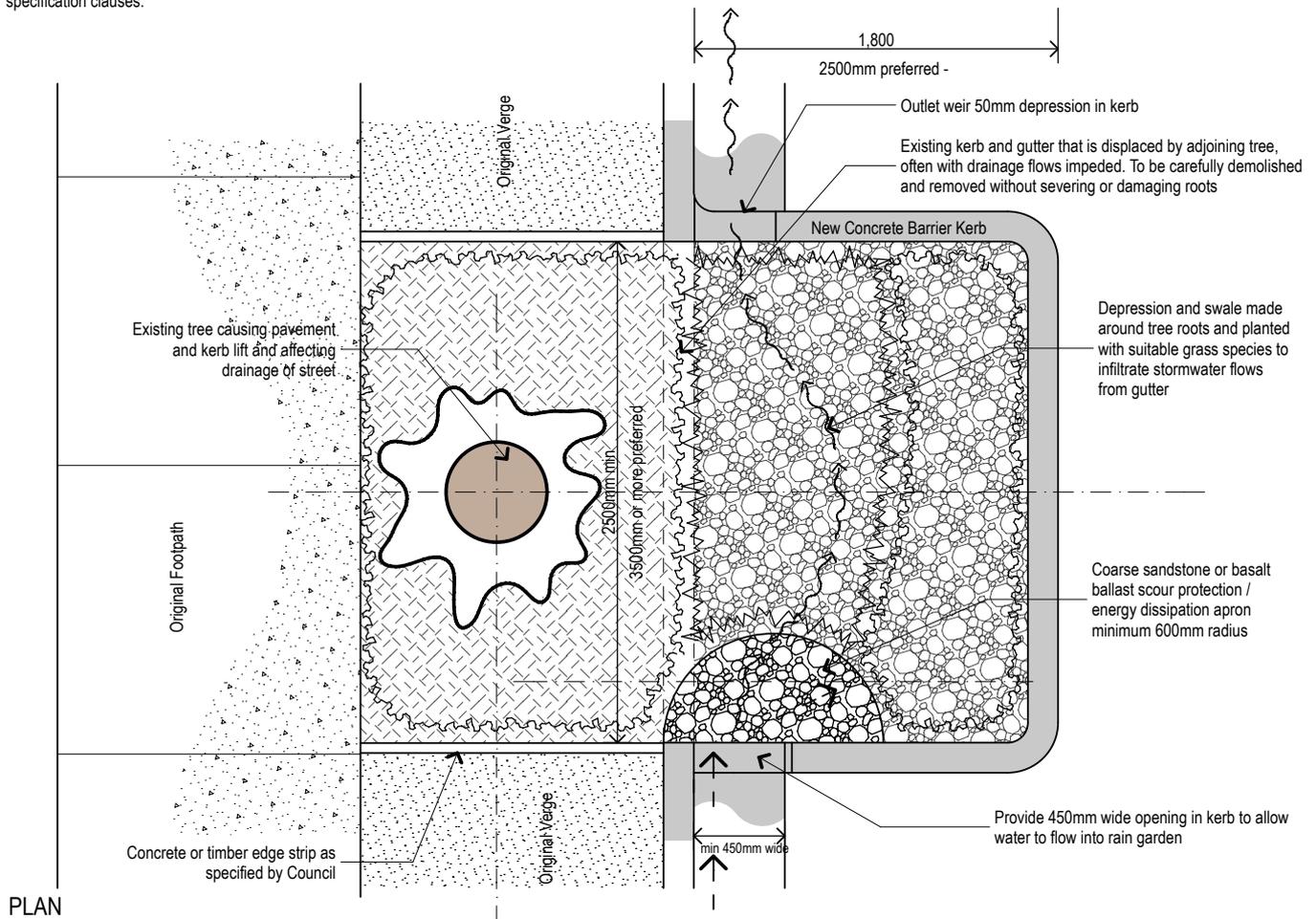
NOTE:
 All details are to be read in conjunction with any site specific DA conditions, Council issued Contract Documentation or relevant general specification clauses.



Scale 1: 25 @ A3 0 500 1000mm

NOTE:
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NOTE:
If the tree is eventually removed, a new suitable tree could be planted centrally and retain the area as a raingarden with in-road planting without any further amendments.



SECTION

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4.4 Street Tree Pruning Specification

1. Overview

Pruning has a direct impact on the health, structure and viability of a tree. All pruning of live tissue results in a wound to the tree, which the tree has to attempt to seal and compartmentalise. Incorrect pruning techniques can, and do, lead to decay and disease within the tree, much the same as a wound in animals can lead to disease and infection.

Pruning of the canopy also has the consequence of removing valuable foliage, which in-turn removes an essential source of energy production from the tree. The tree will then also spend considerable reserves of energy in trying to regrow the losses of the removed foliage. Branches and trunks also hold important transport and storage tissues within the tree.

As per Wingecarribee's Street Tree Master Plan and Urban Tree Policy, Council will generally not consider leaf, fruit, sap or bark drop or bird and bat droppings as valid reasons to prune or remove a street tree.

2. Canopy Pruning

Pruning of branches of street trees shall be as directed by the Council Tree Management Officer. Pruning is only to be undertaken by a qualified arborist (under the supervision of a person with AQF Level 4 or above). Work is to be in strict accordance with to AS4373-2007 *Pruning of Amenity Trees*. Wounds are not to be treated.

Generally, evaluate the existing plant habit and form together with the desired habit, clearances and form as determined by Council and gain approval prior to any pruning. Minimise the size and number of wounds resulting from all pruning.

Use crown maintenance techniques on all protected trees to improve health and appearance. Use crown modification techniques on all protected trees to accommodate adjacent proposed structures and future construction access. Ensure remaining canopy is balanced with appropriate weight and crown distribution.

Use only clean, sharp pruning implements for all pruning work, ensuring that cuts are made without damage, tearing or bruising of vascular tissue.

Deadwooding

Remove all dead branches greater than 30mm in diameter as required on young trees less than 5m in height. Remove all dead branches of greater than 50mm diameter for existing mature trees greater than 5m in height.

Formative Pruning

Selectively remove branches as required to promote proper form and branching habit, typical for the natural growth habit of the species. For species with an excurrent branching habit, ensure the development of a dominant central leader. Remove lesser competing leaders where required. Ensure that no greater than 15-20% of the total foliage area is removed at any one time. Trees occurring below new or existing overhead power lines shall be pruned to create a lower and multi-branched canopy well below minimum clearances in line with Ausgrid guidelines.

Selective and Reduction Pruning

Remove identified branches for building clearance requirements. These should be removed to a suitable internal lateral branch at least 1/3 the diameter of the branch removed or to the branch collar at the stem. Also remove any broken, damaged and defective branches as required. Remove

crossing and rubbing branches and branches with included bark at their junction to ensure proper form and branching habit as required.

Crown Lifting

Remove the lower branches as required to create adequate vehicular and pedestrian clearance up to a minimum height of 2.4m on the pedestrian side or over parking lanes and 4.5m on the trafficable roadside lanes (at 1 metre radius from the centre of the main trunk and outward). Ensure that at least 50% of the foliage arises from the lower two-thirds of the trunk.

Epicormic Growth and Suckers

Typically remove all epicormic growth occurring on the main trunks or basal suckers as and when they occur. If major pruning was undertaken it may be necessary to manage and allow some epicormic growth to mature to provide necessary foliage cover.

3. Root Pruning

Pruning roots of Council managed trees shall only be as directed by the Council and in accordance with AS4373-2007 *Pruning of amenity trees*. The Council shall use only a qualified arborist (AQF Level 4 or above) to undertake the pruning. Prior to any excavation, check that there are no existing underground services along the proposed cut line that may be damaged. Roots are not, under any circumstances to be cut using normal excavation machinery of any sort. This usually results in splitting and massive disturbance well past the intended line of cut.

Preliminary root pruning using a high pressure water knife or air spade is allowable along an alignment of the final cut. Using a high pressure water jet, cut through the soil and tree roots from the surface down to the nominated depth or rock, whichever comes first and in the location(s) as shown on any supplied drawing(s) or as directed by Council. All roots are to be hand excavated and pruned if necessary to provide clean cuts.

When required to cut roots, use sharp hand tools (e.g. secateurs, hand saw) such that the remaining root system is preserved intact and undamaged. Roots are to be cut back by hand, square to the edge of the excavation. Do not cut any tree roots exceeding 100mm diameter unless permitted by Council and after evaluation by an AQF Level 5 arborist.

Excavations within root zones should be kept open for as short a period as possible. Any excavated face containing roots is to be supported immediately after cutting, where necessary, to prevent soil loss from around the retained roots.

4. Post Root Pruning Care

Cover the cut face of the roots with moist hessian or jute immediately after pruning. Maintain in a moist state until permanent or temporary backfilling can be achieved.

If no temporary measures are required and finished levels can be achieved, backfill all excavations around tree roots with a mixture consisting of one part by volume of site soil and three parts of washed coarse sand with a neutral pH value, free from weed growth and harmful materials. Place the backfill in 150-200mm layers and thoroughly water the root zone surrounding the tree.

Apply root inducing hormone, Auxinone by Barmac Industries (or approved equivalent) at a rate of 1 part Auxinone to 50 parts water together with a soil wetting agent to the area around the cut root surfaces once per week for 10 weeks.