

6.0 Appendices

6.1 References

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6.2 ABC Priority Streets

During fieldwork and review for the preparation of the Street Tree Master Plan 2014 the following streets were identified as 'priority' streets for the expansion or the introduction of Aerial Bundled Conductor 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 needing to be employed as the tree encroaches on the wires.

Street Name	Precinct Name
Vernon Street	01. Dulwich Hill East
Loftus Street	01. Dulwich Hill East
Margaret Street	01. Dulwich Hill East
Wilga Avenue	01. Dulwich Hill East
Bedford Crescent	01. Dulwich Hill East
New Canterbury Road	02. Dulwich Hill West
Lewisham Street	02. Dulwich Hill West
Jesmond Avenue	02. Dulwich Hill West
Clargo Street	02. Dulwich Hill West
Benham Street	02. Dulwich Hill West
Fairmount Street	02. Dulwich Hill West
Maddock Street	02. Dulwich Hill West
The Boulevarde	03. Lewisham & Petersham North
West Street	03. Lewisham & Petersham North
Jubilee Street	03. Lewisham & Petersham North
Searl Street	03. Lewisham & Petersham North
The Avenue	03. Lewisham & Petersham North
Thomas Street	03. Lewisham & Petersham North
Old Canterbury Road	03. Lewisham & Petersham North
Carrington Street	03. Lewisham & Petersham North
Despointes Street	04. Marrickville Central
Brereton Avenue	04. Marrickville Central
Marrickville Road	04. Marrickville Central
Juliett Street	05. Marrickville Industrial
Gladstone Street	05. Marrickville Industrial
Garners Avenue	05. Marrickville Industrial
Marrickville Road	05. Marrickville Industrial
Carrington Road	06. Marrickville South
Harnett Avenue	06. Marrickville South
Wrights Avenue	06. Marrickville South
Moyes Street	06. Marrickville South
Warburton Street	06. Marrickville South
Kays Avenue East	06. Marrickville South
Dudley Street	06. Marrickville South
Wallace Street	06. Marrickville South
Cardigan Street	07. Newtown North & Camperdown
Pidcock Street	07. Newtown North & Camperdown
Federation Road	07. Newtown North & Camperdown
Hopetoun Street	07. Newtown North & Camperdown
Marmion Street	07. Newtown North & Camperdown
Rowley Street	07. Newtown North & Camperdown

Street Name (cont.)	Precinct Name (cont.)
Gilpin Street	07. Newtown North & Camperdown
Trade Street	07. Newtown North & Camperdown
Surrey Street	07. Newtown North & Camperdown
Cruikshank Street	07. Newtown North & Camperdown
Walnora Avenue	08. Newtown South & Enmore
Holmwood Street	08. Newtown South & Enmore
Dickson Street	08. Newtown South & Enmore
Pemell Street	08. Newtown South & Enmore
Stanmore Road	09. Newington
Browns Avenue	09. Newington
Addison Road	09. Newington
Livingstone Road	09. Newington
Coronation Ave	09. Newington
Denning Street	09. Newington
Middleton Street	09. Newington
Crystal Street	09. Newington
Gordon Street	09. Newington
Nelson Place	09. Newington
Fisher Street	09. Newington
Cannon Street	10. Stanmore North
Phillip Street	10. Stanmore North
Stanley Street	10. Stanmore North
Crystal Street	10. Stanmore North
Princes Highway	11. Sydenham & St Peters
Goodsell Street	11. Sydenham & St Peters
May Street	11. Sydenham & St Peters
Unwins Bridge Road	11. Sydenham & St Peters
Princes Highway	12. Tempe
Unwins Bridge Road	12. Tempe
John Street	12. Tempe
William Street	12. Tempe
Edgar Street	12. Tempe

6.3 In-Road Planting Opportunities

During fieldwork and review for the preparation of the Street Tree Master Plan 2014 the following streets were identified as 'potential' streets for the continuation, expansion or introduction of in-road planting. This has been based primarily on identifying streets where carriage way widths would accommodate such planting or where moving the trees into the roadway could alleviate other constraints such as overhead wires. Many of these locations could also be utilised for WSUD initiatives and the use of stormwater runoff to passively irrigate the trees, improving their ability to survive prolonged dry spells.

Existing In-Road Planting to be Continued

Streets that have in-road planting already that should be retained and continued, even though species may be adjusted to reflect current planting needs.

Address	Precinct
Canonbury Grove, Dulwich Hill	1. Dulwich Hill East
Durham Street, Dulwich Hill	1. Dulwich Hill East
Ness Avenue, Dulwich Hill	1. Dulwich Hill East
Fairfowl Street, Dulwich Hill	1. Dulwich Hill East
Williams Parade, Dulwich Hill	2. Dulwich Hill West
David Street, Marrickville	4. Marrickville Central
Harney Street, Marrickville	4. Marrickville Central
Marrickville Avenue, Marrickville	4. Marrickville Central
Northcote Street, Marrickville	4. Marrickville Central
Robert Street, Marrickville	4. Marrickville Central
Woodcourt Street, Marrickville	4. Marrickville Central
Graham Avenue, Marrickville	5. Marrickville Central
Frampton Ave, Marrickville	5. Marrickville Industrial
Juliett Street, Marrickville	5. Marrickville Industrial
Victoria Rd (east of Juliett St)	5. Marrickville Industrial
Ewart Street, Marrickville	6. Marrickville South
Excelsior Parade, Marrickville	6. Marrickville South
Harnett Avenue, Marrickville	6. Marrickville South
Kays Avenue East, Marrickville	6. Marrickville South
Osgood Avenue, Marrickville	6. Marrickville South
Warburton Street, Marrickville	6. Marrickville South
Marmion Street, Camperdown	7. Newtown North & Camperdown
Charles Street, Enmore	8. Newtown South & Enmore
Juliett Street, Marrickville	8. Newtown South & Enmore
Liberty Street, Newtown	8. Newtown South & Enmore
Metropolitan Road, Newtown	8. Newtown South & Enmore
Pemell Street, Newtown	8. Newtown South & Enmore
Goodsell Street, St Peters	11. Sydenham & St Peters
Griffiths Street, Tempe	12. Tempe
John Street, Tempe	12. Tempe
William Street, Tempe	12. Tempe

Narrow Streets Where In-Road Planting should be explored

Narrow verge streets that have been identified as potential in-road planting to allow street trees to be better accommodated.

Street	Precinct
Elswick Street, Petersham	3. Lewisham & Petersham North
Queen Street, Petersham	3. Lewisham & Petersham North
Derby Street, Camperdown	7. Newtown North & Camperdown
Ross Street, Camperdown	7. Newtown North & Camperdown
Eton Street, Camperdown	7. Newtown North & Camperdown
Albermarle Street, Camperdown	7. Newtown North & Camperdown
Probert Street, Newtown	7. Newtown North & Camperdown
Bishopgate Street, Newtown	7. Newtown North & Camperdown
St Marys Street, Newtown	7. Newtown North & Camperdown
Chelmsford Street, Camperdown	7. Newtown North & Camperdown
Oxford Street, Newtown	7. Newtown North & Camperdown
Baltic Street, Newtown	7. Newtown North & Camperdown
Station Street, Newtown	7. Newtown North & Camperdown
Pierce Street, Newtown	7. Newtown North & Camperdown
Clara Street, Newtown	8. Newtown South & Enmore
Simmons Street, Newtown	8. Newtown South & Enmore
Sloane Street, Newtown	8. Newtown South & Enmore
Pearl Street, Newtown	8. Newtown South & Enmore
Wells Street, Newtown	8. Newtown South & Enmore
John Street, Newtown	8. Newtown South & Enmore
Margaret Street, Newtown	8. Newtown South & Enmore
Bailey Street, Newtown	8. Newtown South & Enmore
Denison Street, Newtown	8. Newtown South & Enmore

New In-Road Planting Opportunities

The table below lists streets that been identified for potential in-road planting.

Street	Precinct	WSUD
Balfour Street, Dulwich Hill	1. Dulwich Hill East	*
Kays Avenue West, Dulwich Hill	1. Dulwich Hill East	
Tennyson St, Dulwich Hill	1. Dulwich Hill East	*
Vernon Street, Lewisham	1. Dulwich Hill East	*
Abergeldie Street, Dulwich Hill	2. Dulwich Hill West	
Arlington Street, Dulwich Hill	2. Dulwich Hill West	
Clargo Street, Dulwich Hill	2. Dulwich Hill West	
Gelding Street, Dulwich Hill	2. Dulwich Hill West	*
Hampstead Road, Dulwich Hill	2. Dulwich Hill West	
Jesmond Avenue, Dulwich Hill	2. Dulwich Hill West	*
Maddock Street, Dulwich Hill	2. Dulwich Hill West	*
May Street, Dulwich Hill	2. Dulwich Hill West	*
Weston Street, Dulwich Hill	2. Dulwich Hill West	
Carrington Street, Lewisham	3. Lewisham & Petersham North	*
Eltham Street, Dulwich Hill	3. Lewisham & Petersham North	
Henry Street, Lewisham	3. Lewisham & Petersham North	*
Jubilee Street, Lewisham	3. Lewisham & Petersham North	*
Searl Street, Petersham	3. Lewisham & Petersham North	*
The Avenue, Petersham	3. Lewisham & Petersham North	
Thomas Street, Lewisham	3. Lewisham & Petersham North	*
Amy Street, Marrickville	4. Marrickville Central	
Anderton Street, Marrickville	4. Marrickville Central	*
Ann Street, Marrickville	4. Marrickville Central	
Brereton Avenue, Marrickville	4. Marrickville Central	*
Cecelia Street, Marrickville	4. Marrickville Central	
Charles Street, Marrickville	4. Marrickville Central	
Darley Street, Marrickville	4. Marrickville Central	
Enfield Street, Marrickville	4. Marrickville Central	*
Gordon Square, Marrickville	4. Marrickville Central	*
Harrison Street, Marrickville	4. Marrickville Central	*
Horton Street, Marrickville	4. Marrickville Central	
Pile Street, Marrickville	4. Marrickville Central	*
Woodbury Street, Marrickville	4. Marrickville Central	*
Sydney Street, Marrickville	5. Marrickville Industrial	
Charlotte Street, Marrickville	6. Marrickville South	*
Day Street, Marrickville	6. Marrickville South	
Grove Street, Marrickville	6. Marrickville South	*
Mansion Street, Marrickville	6. Marrickville South	*

Street (cont.)	Precinct (cont.)	WSUD
Richards Ave, Marrickville	6. Marrickville South	*
Tamar Street, Marrickville	6. Marrickville South	*
View Street, Marrickville	6. Marrickville South	*
Rowley Street, Camperdown	7. Newtown North & Camperdown	*
Trade Street, Camperdown	7. Newtown North & Camperdown	
Dickson Street, Newtown	8. Newtown South & Enmore	
Lynch Avenue, Enmore	8. Newtown South & Enmore	
Albert Street, Petersham	9. Newington	
Audley Street, Petersham	9. Newington	
Ducros Street, Petersham	9. Newington	
Maria Street, Petersham	9. Newington	
McRae Street, Petersham	9. Newington	*
Morgan Street, Petersham	9. Newington	*
Cannon Street, Stanmore	10. Stanmore North	
Hillcrest Street, Tempe	12. Tempe	*

* Streets identified where planting may be combined with appropriate Water Sensitive Urban Design (WSUD) initiatives such as rain gardens or biofiltration pits. Any tree planting is to take precedence over WSUD outcome requirements.

6.4 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 Marrickville 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 or any private developers required to carry out work in the public domain.

Key factors that will be considered include:

- Purchase of trees of the specified size and quality
- Tree installation specification - including size of tree pit, and backfill provisions
- Street planting technical details
- Specification and installation of 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.

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.

Definitions for the terms used within this specification shall be in accordance with the NATSPEC guide.

Container Volume	Height (m) above container	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
Palm trees	-	n/a	5.0

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-dominate 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:-

- Demolition of existing tree pit or cutting of the existing footway.
- Excavation of subgrade for tree pits.
- Supply and installation of imported and existing soil mixes.
- Installation of trees.
- Supply and installation of wooden stakes, ties and guys where required to maintain stability.
- Installation of supplied tree guards where specified.
- Supply and installation of various style tree bases, to the Councils specification, after an initial six (6) month soil settlement and tree establishment period.
- Reinstatement of pavement in any aborted tree pits.
- 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:-

- AS 4419-2003 Soils for landscaping and garden use;
- AS 4454-2003 Compost, soil conditioners and mulches;
- AS 4373-2007 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 AS4454.

TYPE B Soil mix: Blended soil mix comprising 50% recovered existing site topsoil (or imported premium grade 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 October (autumn and spring).

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 or a suitably sharp and clean spade. 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 75mm 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.

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 on specified trees.

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 end of plant the establishment period.	Organic liquid fertiliser. Seasol or approved equivalent applied to soil as per manufacturers directions.

4.4 Aeration 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.

5. Tree Planting Details

Technical details have been developed to ensure Council staff, developers and Council contractors provide an appropriate and consistent treatment for street tree planting throughout the variety of street environments typically encountered.

The Appendix 6.6 illustrate the typical details to be applied.

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.

6.5 Street Tree Pruning Specifications

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 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 Marrickville's Street Tree Master Plan, Section 1.8 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.

Palms

Only remove the old and spent fruits and fronds. Never remove the terminal shoot. To avoid transmission of diseases, tools shall be thoroughly disinfected between trees.

3. Root Pruning

Pruning roots of Council managed trees shall only be as directed by the Council. 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 the drawing(s). 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 a 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 moist state until permanent or temporary backfilling can be achieved.

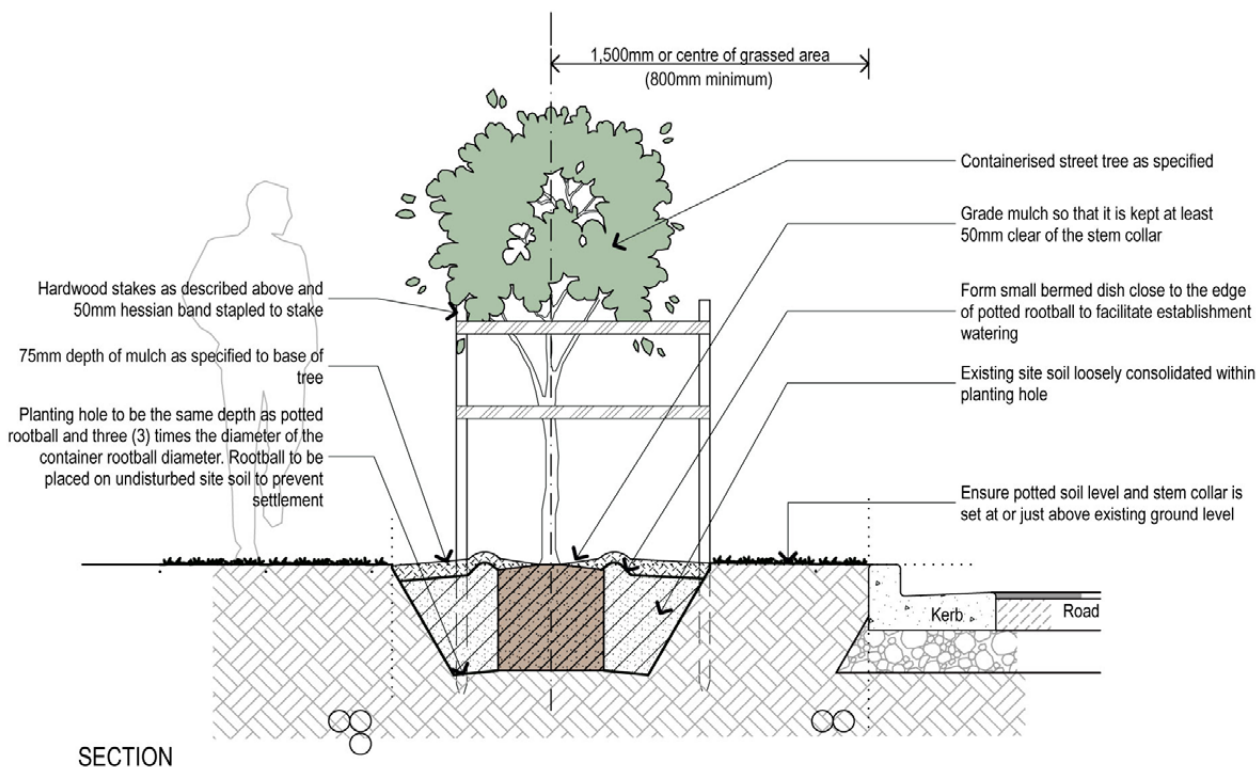
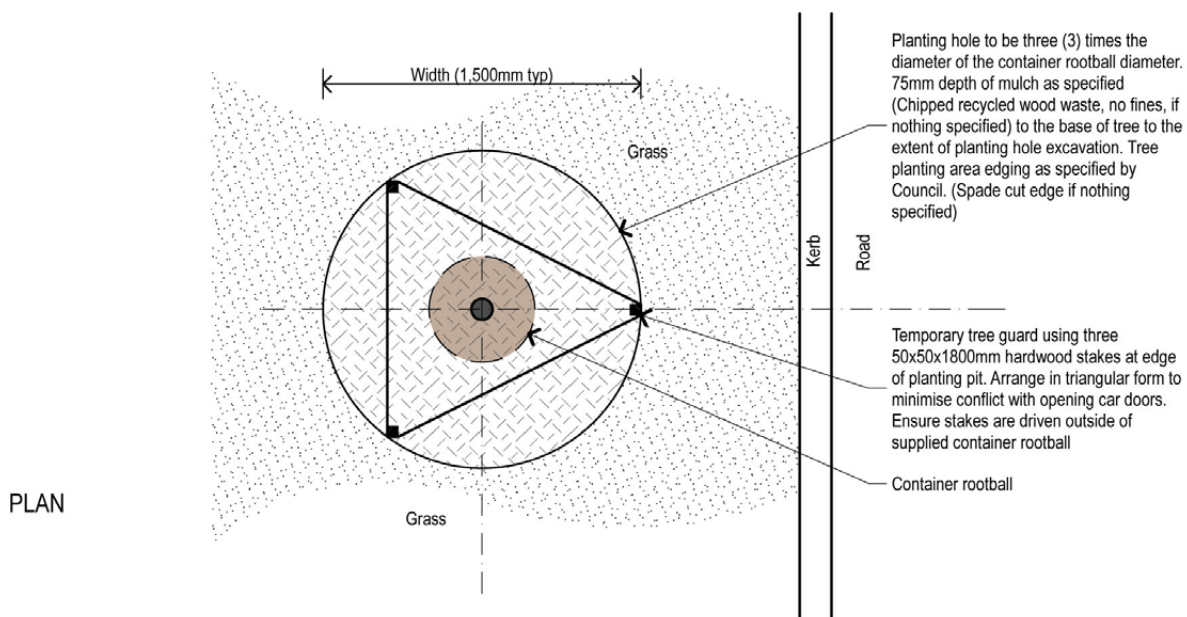
If no temporary measures are required and finished levels can be achieved, backfill all excavations around tree roots with a mixture consisting of one part by volume of site soil and three parts of washed coarse sand with a neutral pH value, free from weed growth and harmful materials. Place the backfill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

6.6 Typical Street Planting Details

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 Marrickville LGA area. These details may be amended by Council, from time to time, to accommodate site specific circumstances.

NOTE:
 All details are to be read in conjunction with any site specific DA conditions, Council issued Contract Documentation and the general Specification clauses contained in Section 6.4 of the Marrickville Street Tree Master Plan 2014

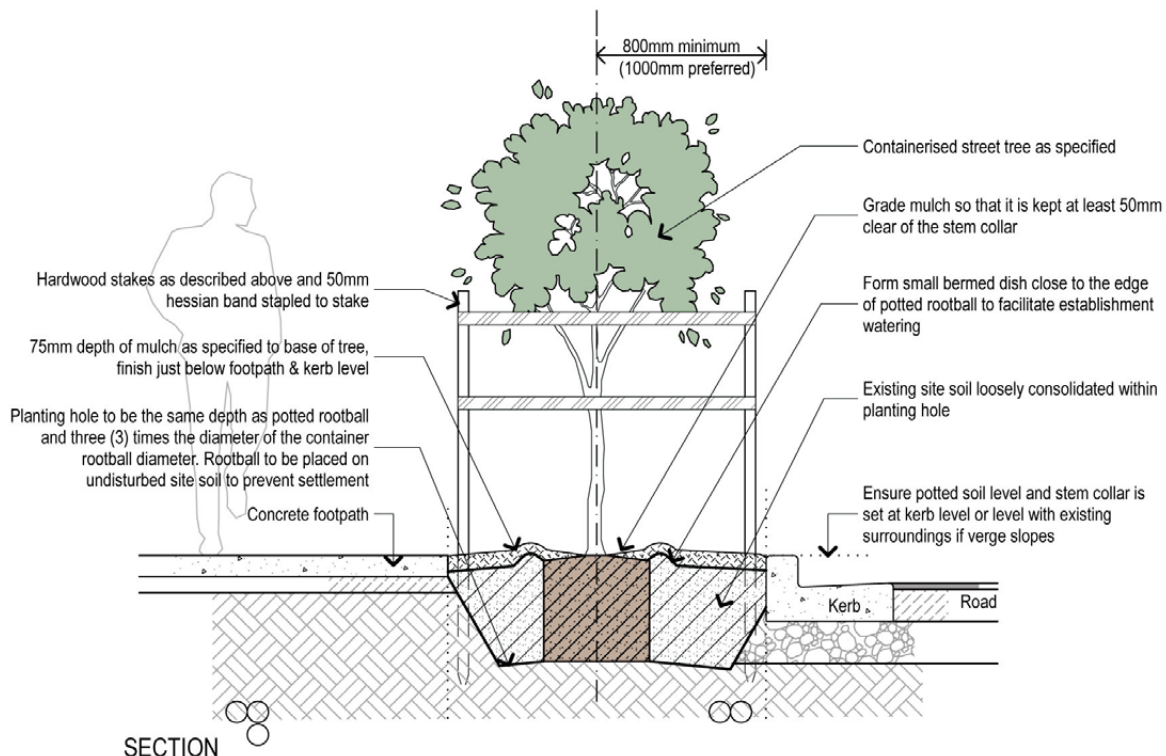
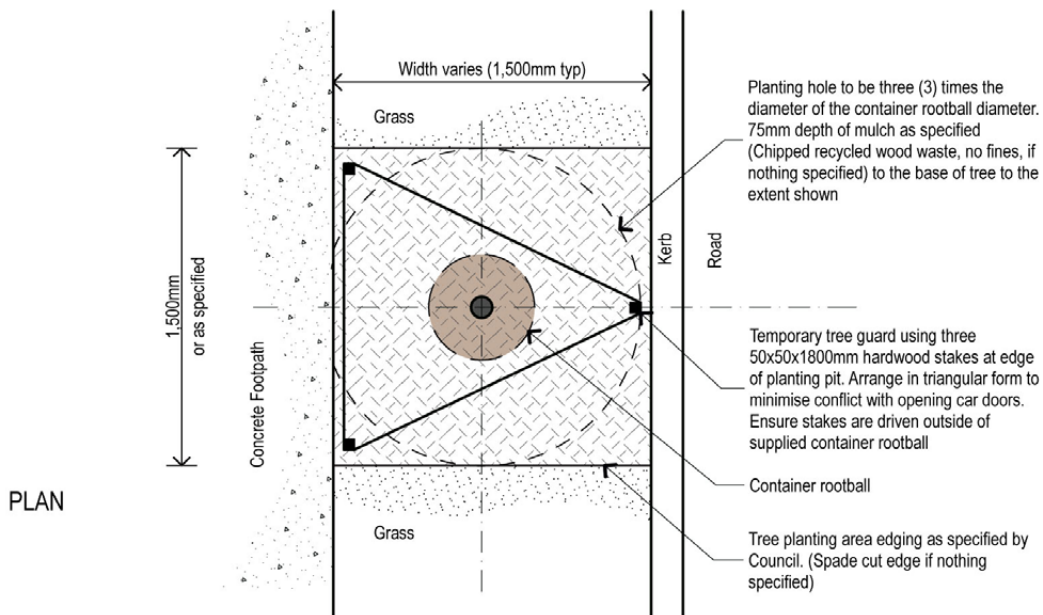


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DETAIL 1 - TREE PLANTING IN GRASSED VERGE WITH NO PATH NEARBY

Marrickville Council

NOTE:
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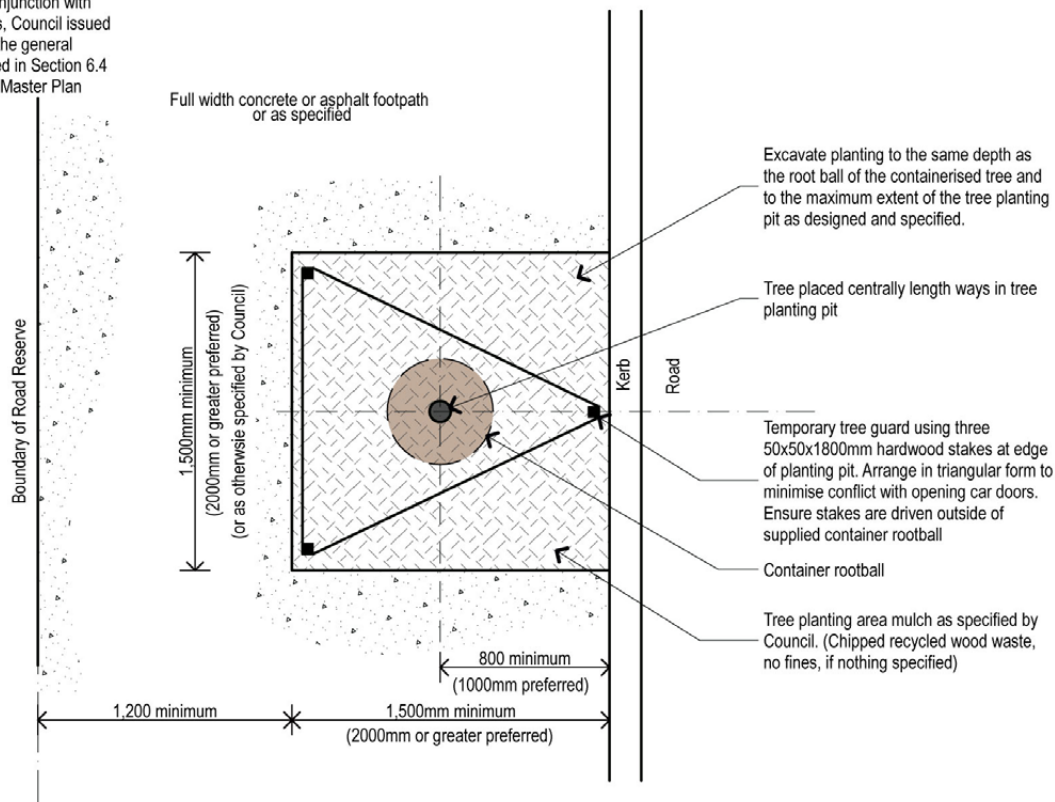


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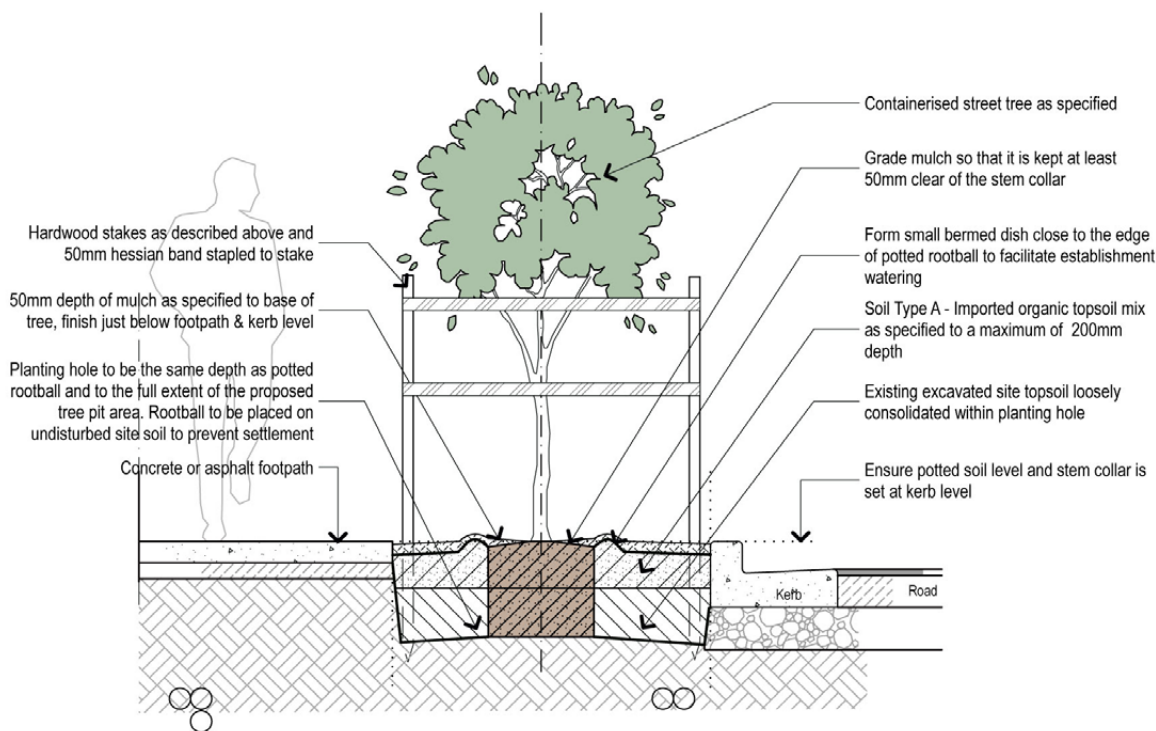
DETAIL 2 - TREE PLANTING IN GRASSED VERGE STRIP WITH ADJOINING PATH

Marrickville Council

NOTE:
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PLAN



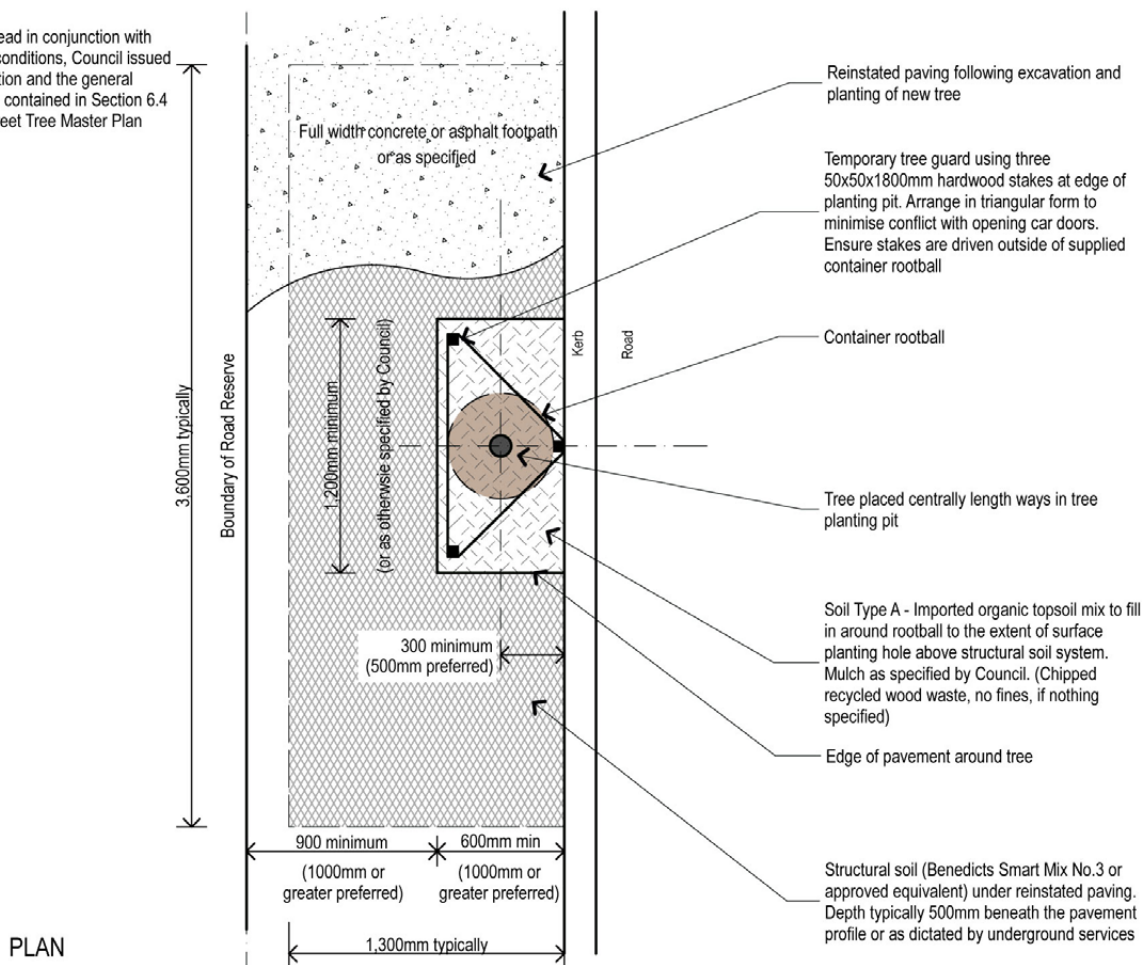
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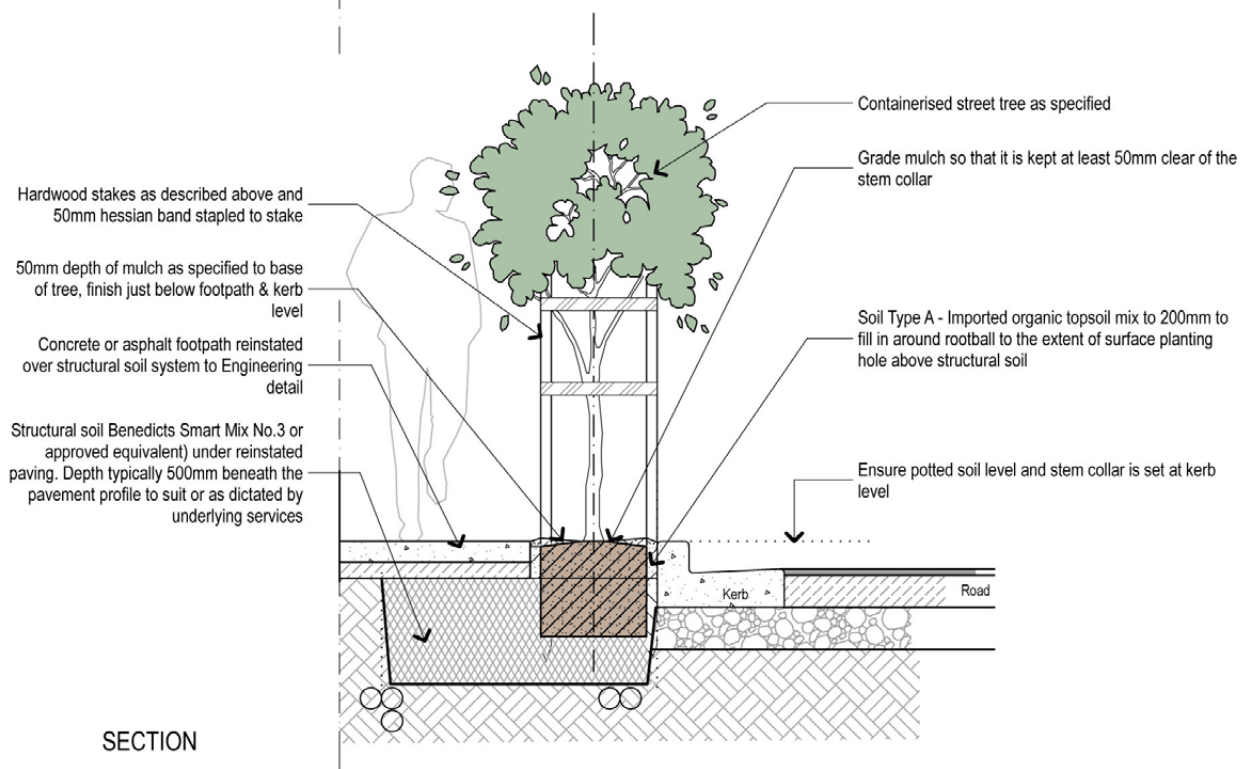
DETAIL 3 - TREE PLANTING IN FULLY PAVED VERGE AND GOOD SURROUNDING SUBSOIL

Marrickville Council

NOTE:
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PLAN

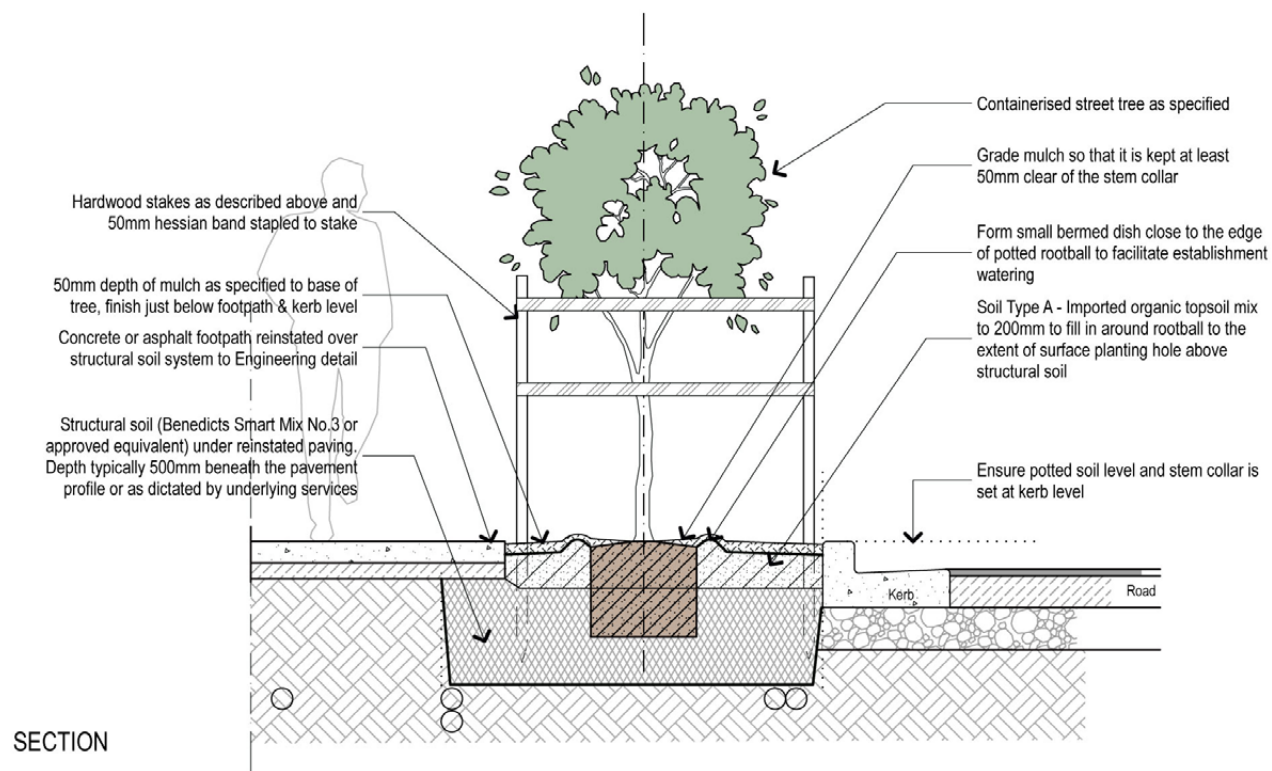
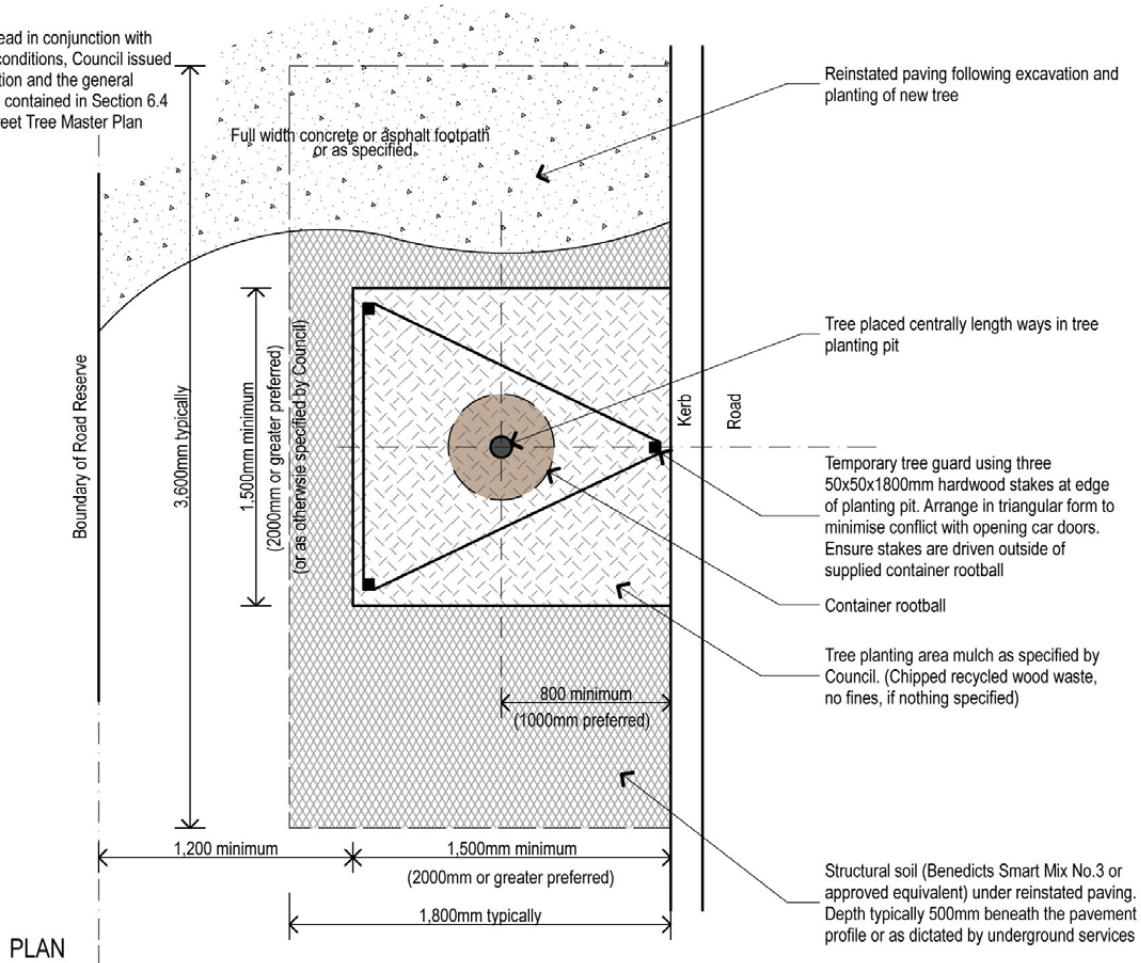


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DETAIL 4 - TREE PLANTING IN NARROW PAVED VERGE WITH EXPANDED SOIL VOLUME

NOTE:
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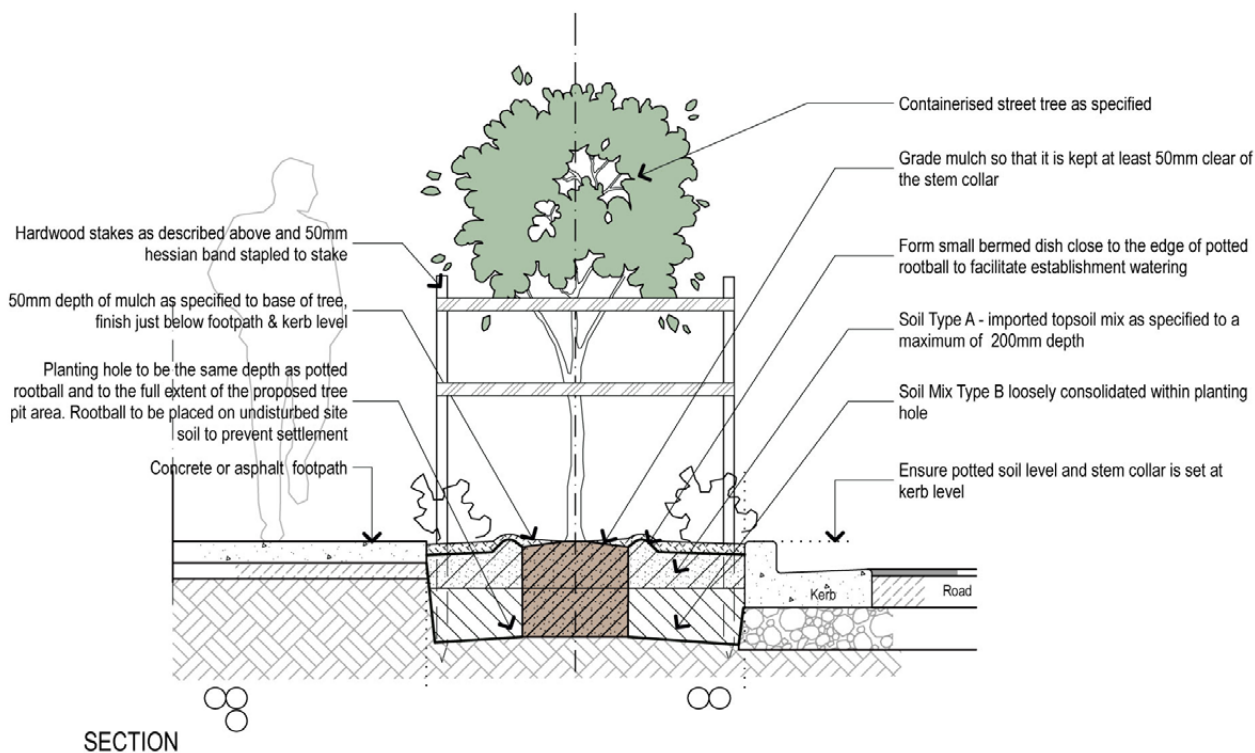
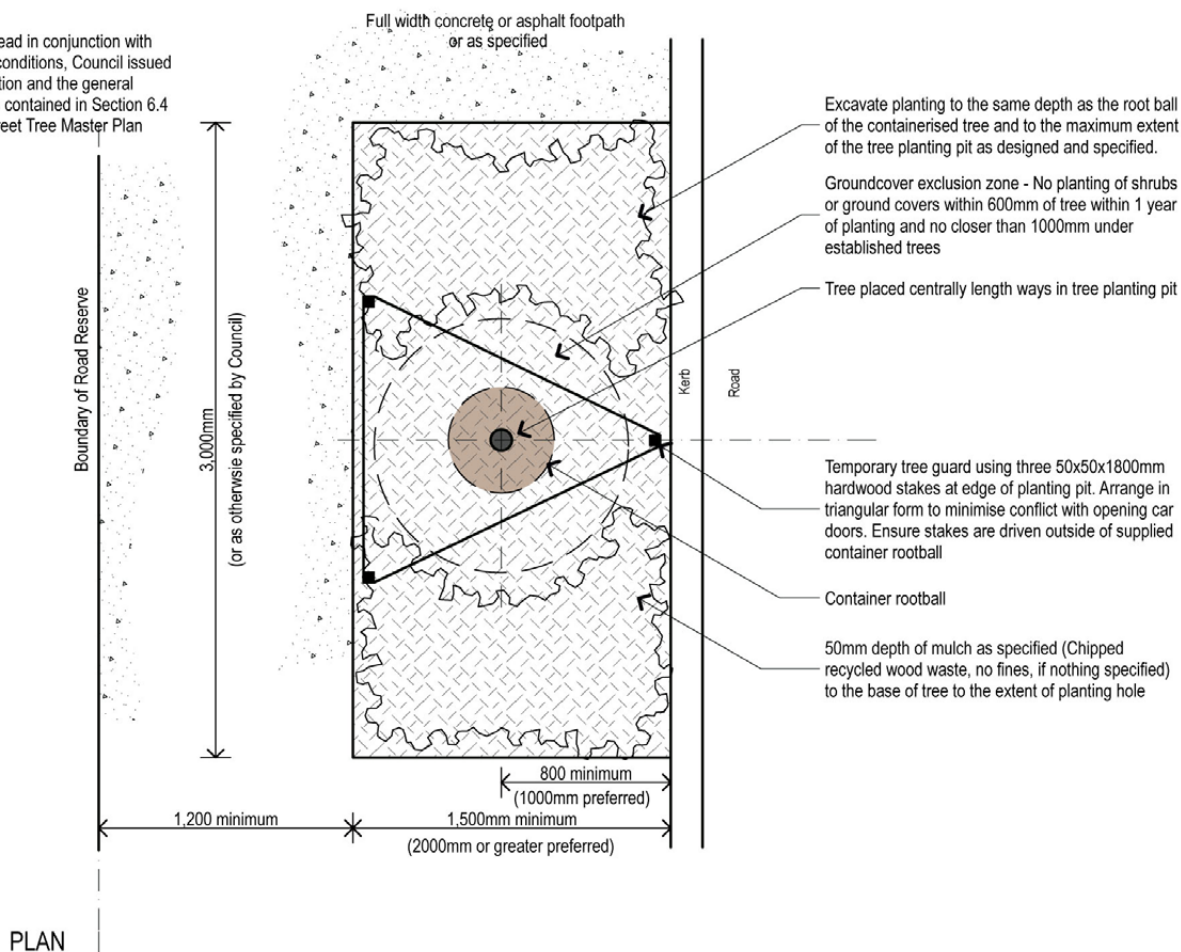


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DETAIL 5 - TREE PLANTING IN FULLY PAVED VERGE WITH EXPANDED SOIL VOLUME

Marrickville Council

NOTE:
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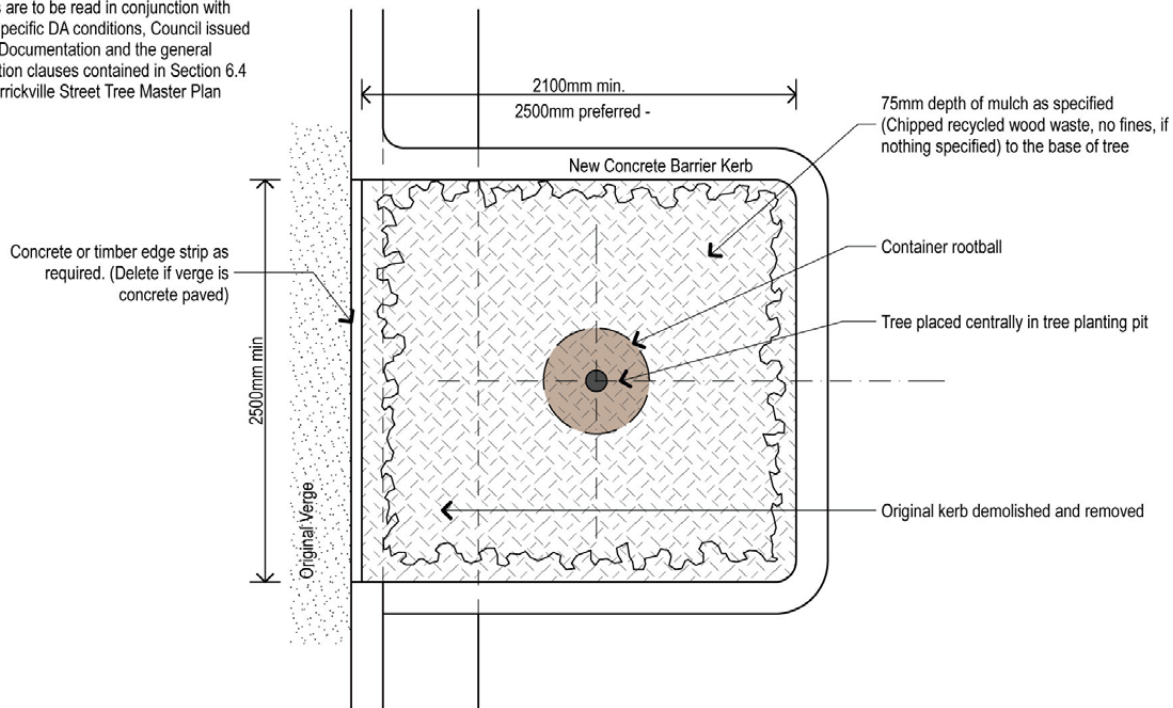
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DETAIL 6 - TREE PLANTING IN FULLY PAVED VERGE WITH EXPANDED TREE PIT GARDEN

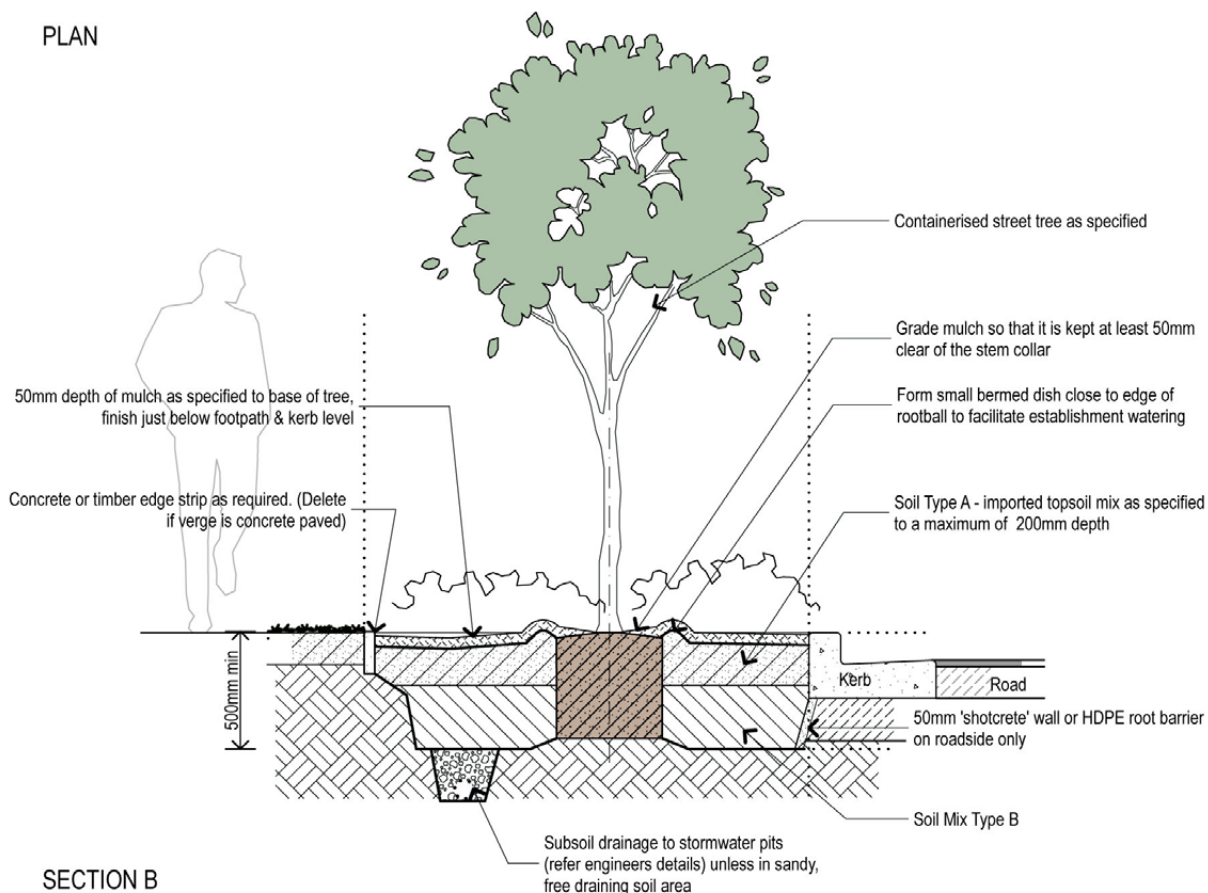
Marrickville Council

NOTE:

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PLAN



SECTION B

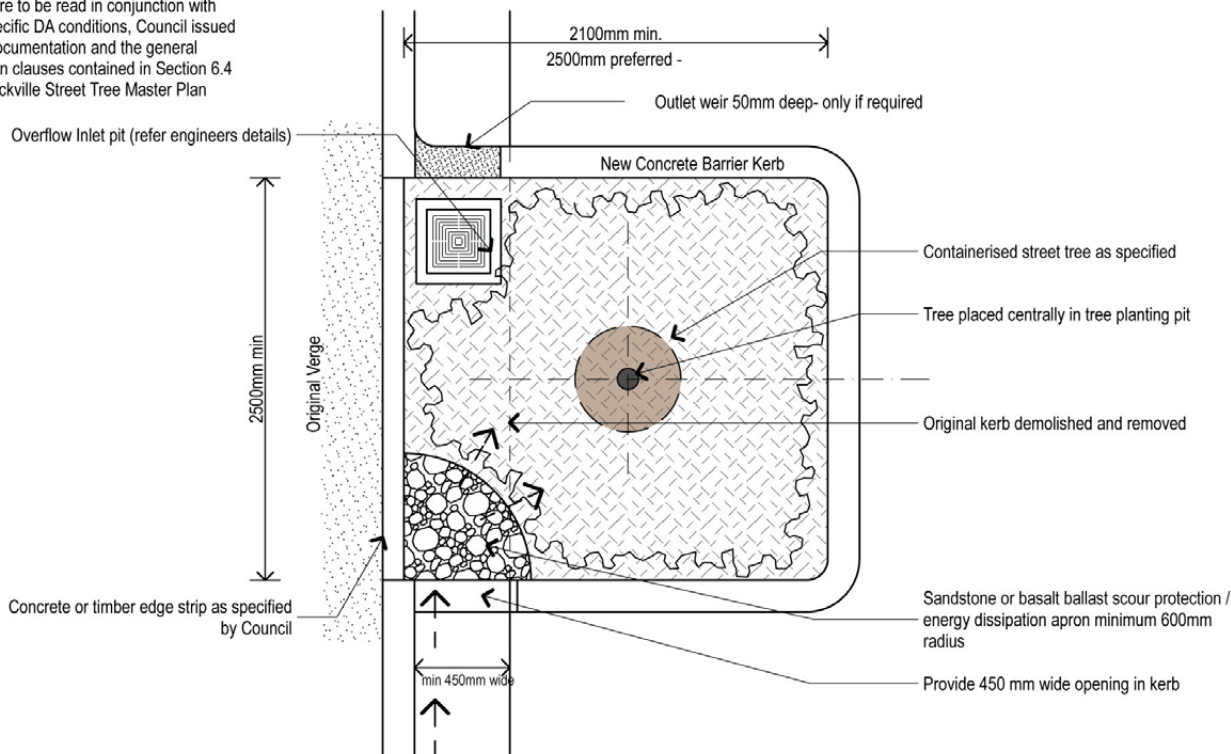
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DETAIL 7 - INDICATIVE IN ROAD PLANTING WITH KERB EXTENSION

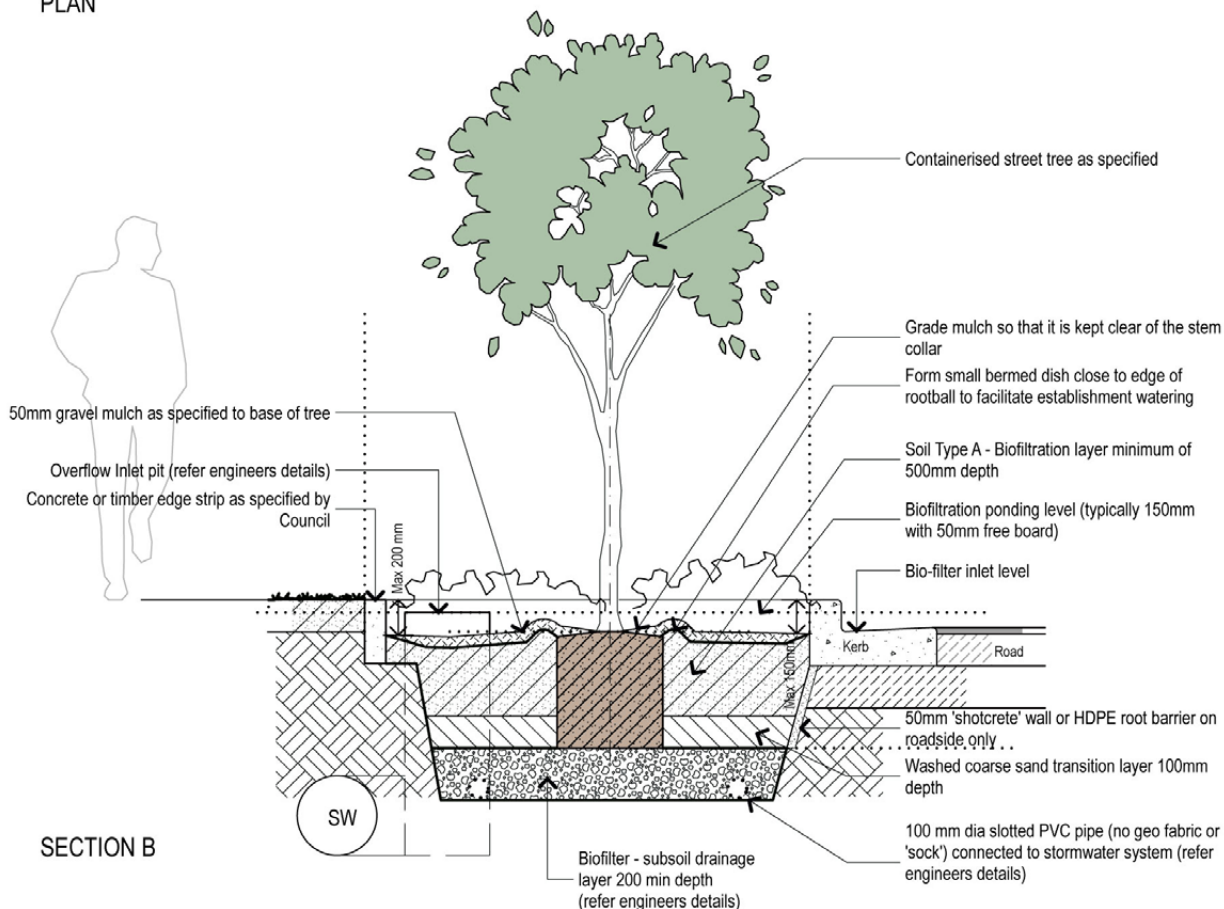
Marrickville Council

NOTE:

All details are to be read in conjunction with any site specific DA conditions, Council issued Contract Documentation and the general Specification clauses contained in Section 6.4 of the Marrickville Street Tree Master Plan 2014



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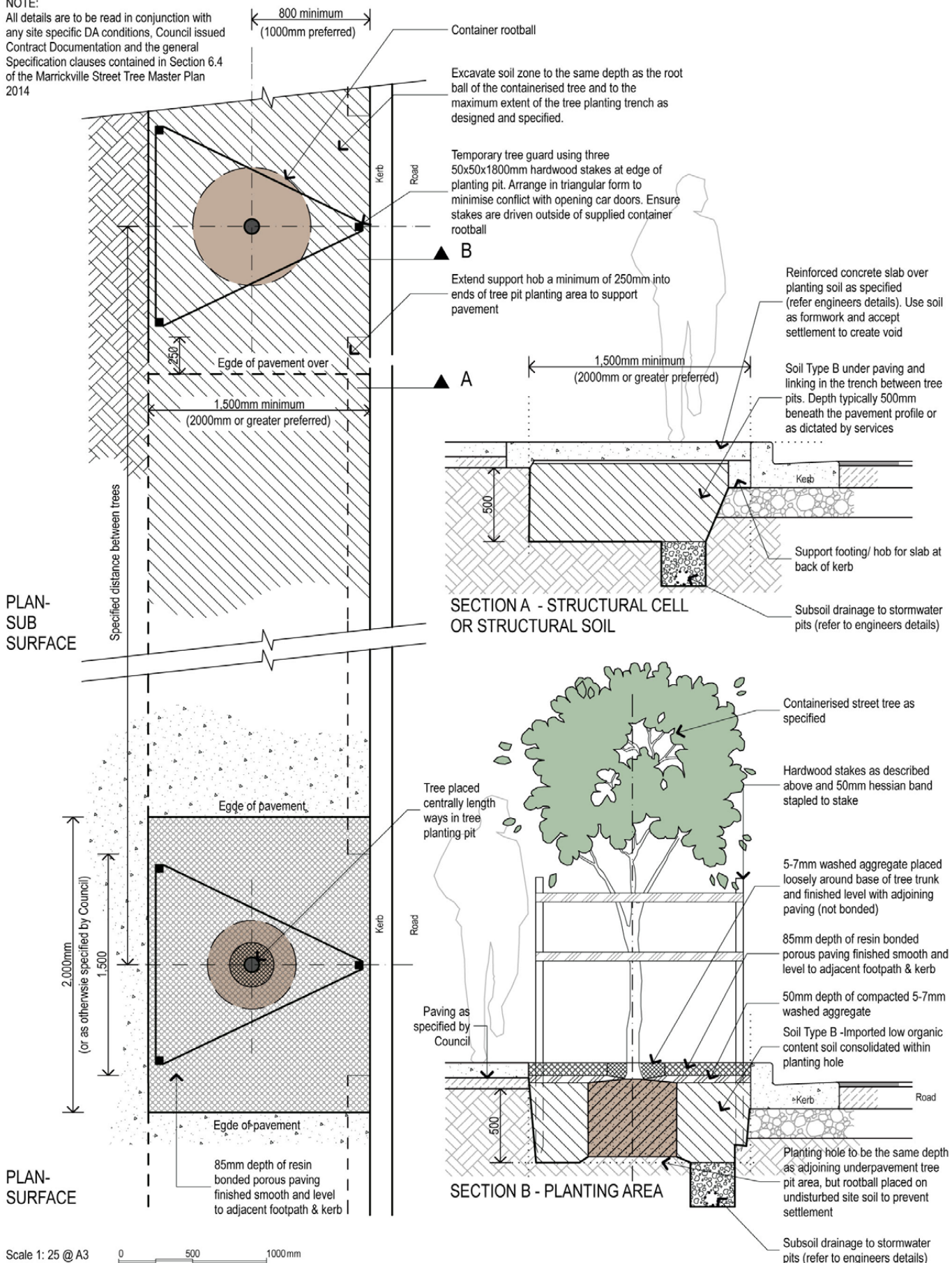
SECTION B

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DETAIL 8 - INDICATIVE IN ROAD PLANTING WITH KERB EXTENSION & BIOFILTRATION

Marrickville Council

NOTE:
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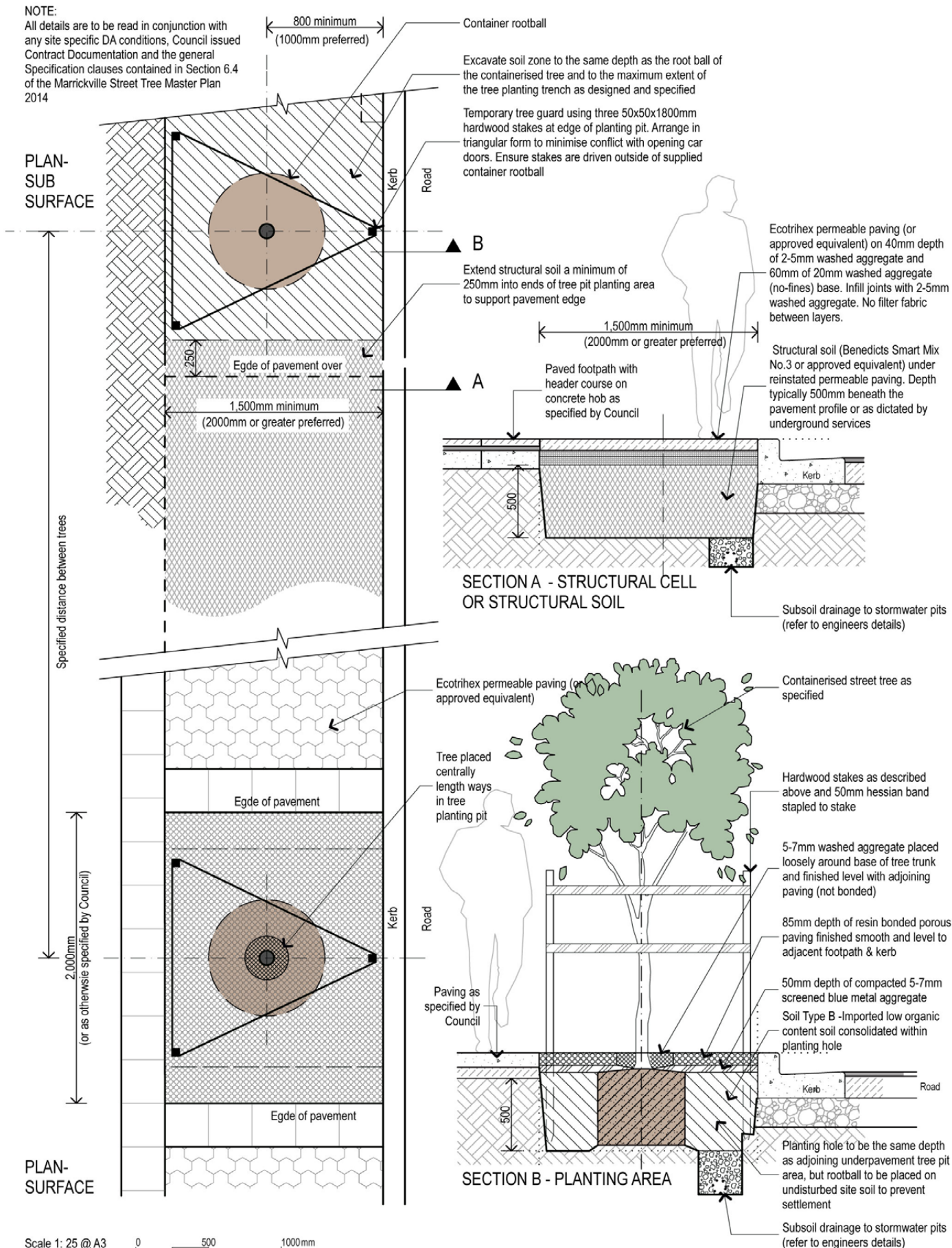


DETAIL 9 - 75-200L TREE PLANTING WITH VAULTED INTERCONNECTED SOIL TRENCH

Marrickville Council

NOTE:

All details are to be read in conjunction with any site specific DA conditions, Council issued Contract Documentation and the general Specification clauses contained in Section 6.4 of the Marrickville Street Tree Master Plan 2014

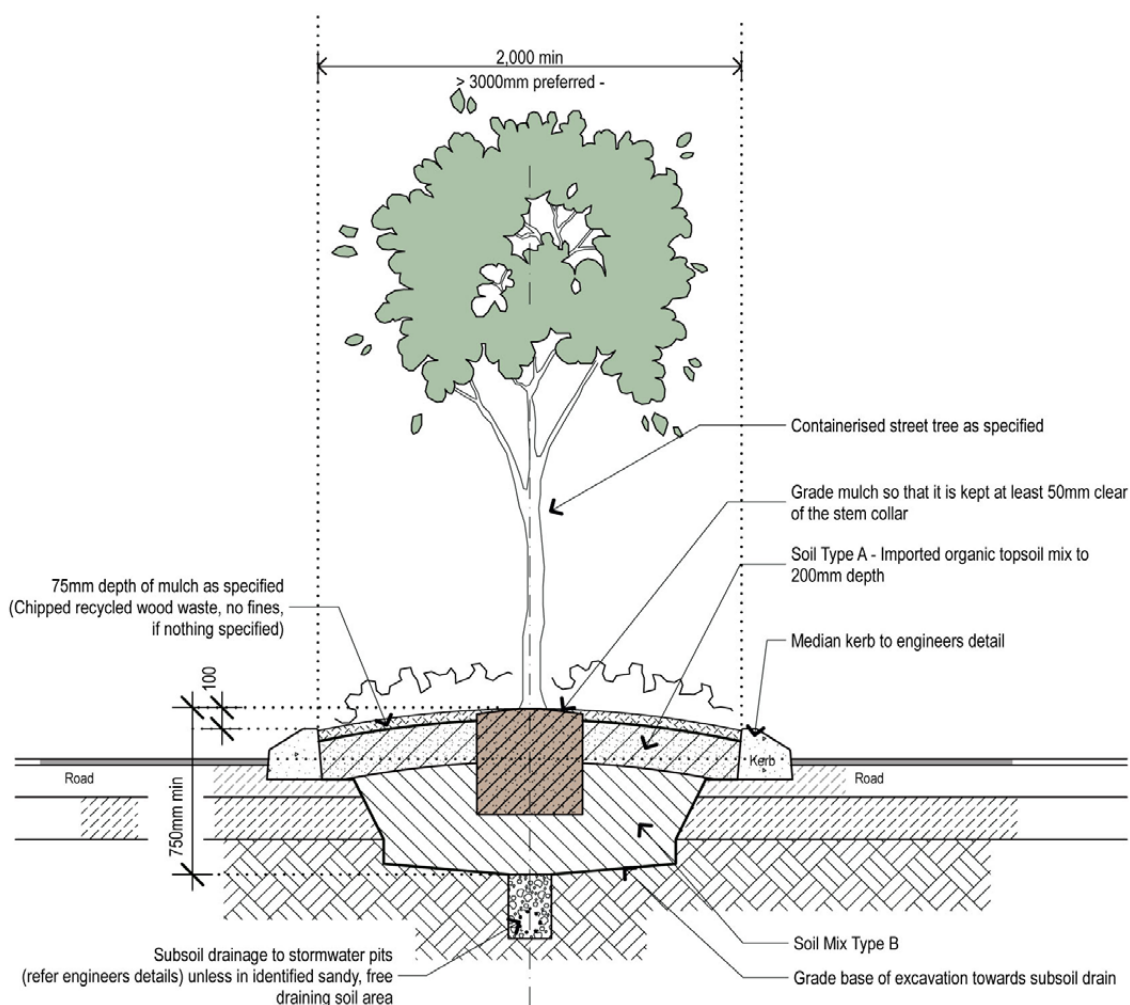


DETAIL 10 - 75-200L TREE PLANTING IN PERMEABLE PAVING WITH STRUCTURAL SOIL

Marrickville Council

NOTE:

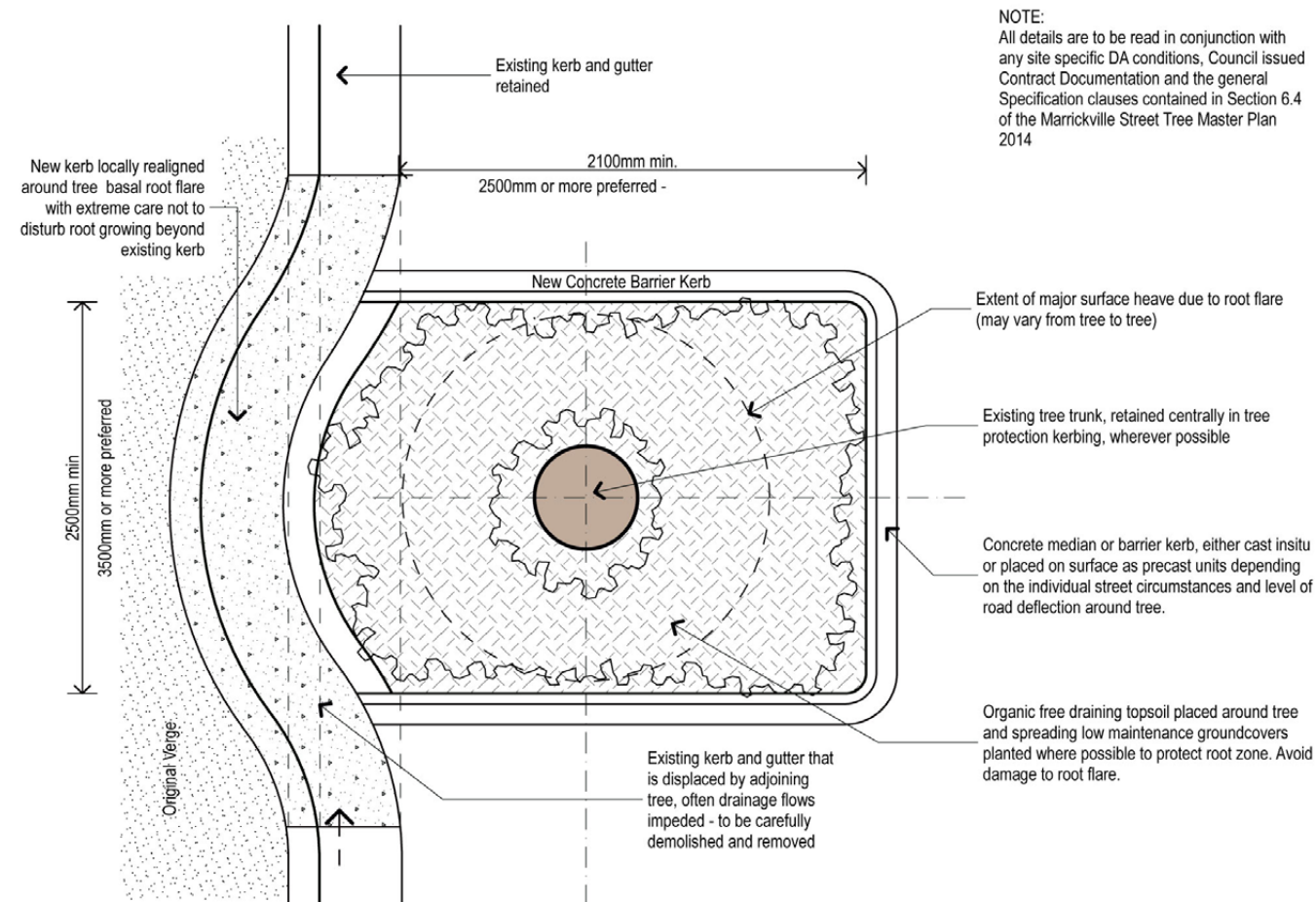
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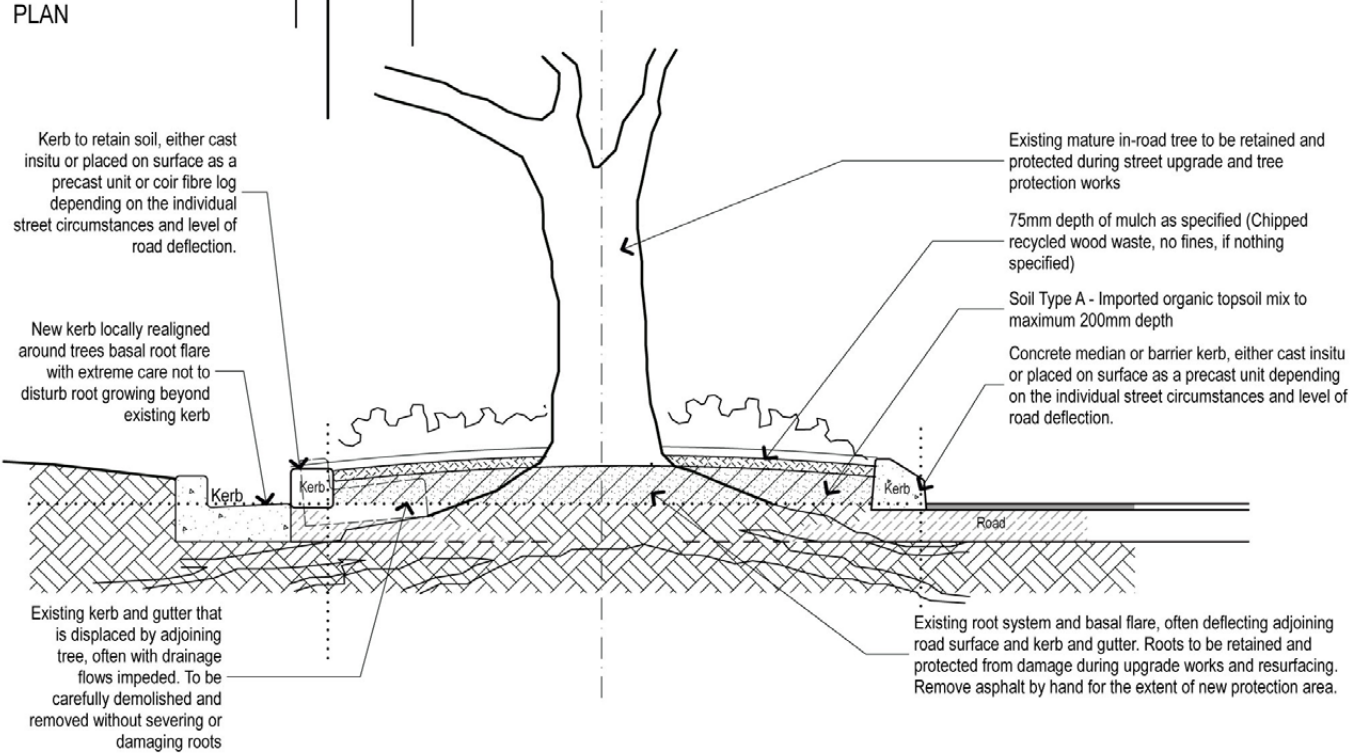
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DETAIL 11 - INDICATIVE IN ROAD CENTRE ISLAND / MEDIAN PLANTING

Marrickville Council



NOTE:
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DETAIL 12 - INDICATIVE EXISTING IN ROAD UPGRADE AND TREE PROTECTION TREATMENT

Marrickville Council