



## Section 8: Landscape works

Sutherland Shire Public Domain Technical Manual  
Part D: Specification

**SUTHERLANDSHIRE**

## **Sutherland Shire Public Domain Technical Manual Part D: Specification**

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## Section 8: Landscape works

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## 8 Landscape works

### 8.1 Scope

This section includes the following landscape works:

- subsoil drainage;
- soil works;
- planting works;
- tree planting in root cells ;
- mulching, turfing, edging and tree guards; and
- maintenance of completed planting works.

#### 8.1.1 Standards and Guidelines

Work carried out and testing performed under this section of the *specification* shall comply with the requirements of the relevant Australian Standards and industry specifications unless stated otherwise in this Specification or the *approved design drawings*.

The following table indicates Australian Standards and guidelines applicable to this section. This table is not exhaustive and may not include all standards and guidelines which may apply to the work to be undertaken.

*AS2303 Tree Stock for Landscape Use*

*AS4419 Soils for Landscaping and Garden Use*

*AS4687 Temporary Fencing and Hording*

*AS 3743 Potting Mixes*

*AS 4373 Pruning of Amenity Trees*

*AS4454 Compost, Soil Conditioners and Mulches*

*AS1289 Methods of Testing Soils for Engineering Purposes*

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*AS4970 Protection of Trees on Development Sites*

*National Plant Labelling Guidelines V2.0 NGIA 2013*

*Natspec Guide No 2 Purchasing Landscape Trees – A guide to assessing tree quality*

*Sutherland Shire Council Native Plant Selector*

*Sutherland Shire Council Centres Plant Selector (PDDM)*

### 8.2 Introduction

#### 8.2.1 General

Construction of all landscape works shall be carried out in a professional and competent manner by a landscape *contractor* who is accredited with the LNA Master Landscape Association for Commercial Landscape Construction works.

All site management measures must be installed prior to the commencement of landscape works and must be retained in place during site works. Refer Section 1: Preliminaries.

#### 8.2.2 Initial preparation

Commencement of *work* by landscape *Contractor* shall be deemed as proof of *Contractor's* acceptance of existing condition of site. No *work* shall be carried out until all underground services have been identified and accurately located and pegged by *contractor*.

All trees to be retained are to be identified, marked and protected prior to the commencement of any construction work on site. Refer Protection of Existing Vegetation.

All Services are to be located and pegged before commencement of earthworks – Refer Section 2: Earthworks.

At least two weeks prior to any earthworks, the *contractor* shall treat areas to be landscaped with the herbicide Glyphosate in any of its registered formulations at the maximum rate specified by the manufacturer for the control of weed(s) encountered prior to the commencing of any other treatment.

### 8.2.3 Stockpiling site topsoil

Wherever possible, site topsoil must be retained and stockpiled on site for later use. The top 100mm layer shall be stripped of vegetation and stockpiled, that topsoil shall be placed in locations detailed on the design drawings or as directed on-site by *Council's representative*.

Refer to Section 8.4.

## 8.3 Landscape subsoil drainage

Shall include all drainage associated with landscape works including subsoil drainage behind retaining walls and in mass planting areas. Subsoil drains shall be installed where shown on the *approved design drawings*. Access points for maintenance shall be provided every 15 metres.

This section shall be read in conjunction with Section 3 of this Specification (Stormwater Drainage) with the following modification for subsoil drainage as part of landscape works.

### 8.3.1 Materials

#### *Geotextile fabric*

Geotextile fabric shall be Bidum A14 or an equivalent proprietary product approved by the *PDC*.

#### *Aggregate*

Aggregate shall be a single size aggregate with a nominal size of between 10 mm and 40mm. The use of clean, recycled one size aggregate is permitted.

#### *Subsoil pipe*

Subsoil pipe shall be 100 mm nominal diameter corrugated flexible slotted PVC pipe in geofabric sock or 100mm  $\mu$ PVC under pavement. PVC and  $\mu$ PVC pipes shall conform to the requirements of AS 1254, where vehicle loads may be encountered, reinforced concrete pipe only, shall be used.

### 8.3.2 Construction

The subsoil drain to be constructed as indicated in the *SSC standard drawings* and/or design drawings. Trenches shall be at least 300mm wide and extend at least 500mm below the Subgrade level or 150mm into solid rock. Undrained depressions greater than 20 mm deep in the trench floor are to be backfilled with approved materials.

The trench is to be fully lined with geotextile fabric and backfilled with aggregate. Pipe to be laid 50mm above the bottom of the trench. The fabric to be folded over full width at the top and all joints shall be lapped a minimum of 300mm. Under pavements, the filter material shall extend to the level of the Sub-Base Course. Where the subsoil line is laid in a stormwater line trench, the slotted PVC pipe shall be wrapped or enclosed in filter materials to prevent backfill material entering the pipe.

Prior to backfilling, the trench, drainage and connection to stormwater shall be approved by the *PDC*. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS.

## 8.4 Soil works

Soil works shall include the supply and installation of all soil for mass planting beds, tree pits and new turf areas including subgrade preparation, fertilisers and soil conditioners.

### 8.4.1 Excavation and subgrade preparation for mass planting beds

The *contractor* shall cultivate existing subgrade to depths indicated on standard drawings. Existing services are not to be disturbed. Keep clear of tree roots in the drip zone. The *contractor* shall cultivate by hand within 300 mm of paths or structures. Remove stones exceeding 25 mm, clods of earth exceeding 50 mm, and weeds, rubbish or other deleterious material brought to the surface during cultivation. All excavations shall be clean of construction debris prior to filling with growing media. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS.

### 8.4.2 Riplines

Riplines shall be ripped to a minimum depth of 450mm. Ripline shall follow contours. Multiple riplines are preferred. Where 3 riplines are used, plants should be planted in the middle line. After ripping, all regrowth shall be sprayed with Glyphosate at the rate of 3 litres/hectare two weeks prior to planting. Minimum distance between rippline planting rows shall be 3m in areas which are not mulched. After ripping, site

shall be left in a mowable condition, free of stones larger than 25mm, clods of earth larger than 50mm and free from ponding.

#### 8.4.3 Subgrade preparation for turf

The area to be turfed shall be clear of debris and shall be prepared in accordance with the following:

- All weeds and grasses shall be sprayed out (14 days prior to installation) using a systemic weed killer (Round Up or an equivalent product) and existing turf removed. Obstacles such as sprinkler-heads, access points and sub-surface service connection points shall be flagged to avoid damage.
- The area shall be raked to eradicate rocks, roots and large clods of soil.
- Shape the site in accordance with project requirements and general industry standard.
- Apply, if specified, any under-turf additives (gravel, sand, soils, organic matter, fertilizers and water retention agents) to ensure soil quality is compatible with the turf to be laid.
- Fertilisers are to be applied in accordance with manufacturers recommended application rate.
- Roll the area to firm the surface and reveal low areas. Apply extra soil to low areas to obtain uniformity in levels.
- Slope the surface away from foundations towards drainage points.
- Finish the sub-surface (approx.) 25 mm below path edges and surrounding turf to ensure laid turf is finished flush.
- Lightly rake the rolled soil again prior to laying turf.
- Water the area to provide a moist base for the turf to a depth of 50 mm.

#### 8.4.4 Existing site topsoil

Site topsoil must be stockpiled and re-used on site wherever possible.

The *contractor* is responsible to make allowance for the stockpiled topsoil to be tested prior to spreading. Three (3) samples of the site won soil shall be randomly selected from different locations. The samples shall be comprehensively laboratory tested by a NATA accredited laboratory (or SSC laboratory). The laboratory report shall be accompanied with recommendations for amelioration measures required to improve any deficiencies. Laboratory certificates shall accompany the sample soil mix submitted for approval at the commencement of the work, including details of

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the soil source. If the site topsoil fails to conform to the above tests, the material may be ameliorated, in accordance with the recommendations of the laboratory report, to reach the relevant Australian Standards and the compliance with the specification.

If the material is deemed unsuitable for amelioration, imported soil shall be used. Refer Section 8.4.4 – Soil Types.

Prior to spreading, ameliorated site topsoil shall be re-tested by a suitably qualified geotechnical laboratory and a complying test certificate shall be provided. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS.

### 8.4.5 Soil types

A sample and laboratory certificate from a NATA accredited laboratory (or SSC laboratory) shall accompany all soils demonstrating the mix is in accordance with this *specification*. Further samples may be taken on delivery. Imported soil not conforming to the Specification shall be removed from the site at the *Contractor's* cost. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS

Soil Type	Application	Description
<b>TYPE A</b>	Mass planting beds with native species	Australian Native Landscapes (ANL) 'Native Low P' soil mix or approved equivalent
<b>TYPE B</b>	Mass planting beds with exotic species	Benedicts Sand and Soil 'Premium Organic Garden Mix' or approved equivalent

<b>TYPE C</b>	Tree planting in pavement -  (Root cell soil mix)	<p>Shall be 40% Growing media: 60% Course Sand + Water Crystal</p> <p>Soil mix shall allow amendments where required by soil chemical analysis to achieve pH and fertility suitable to promote vigorous growth and establishment.</p> <p>Coarse sand shall compose of washed, course river sand 0.25 to 2.0mm diameter, free of weeds, debris or other deleterious materials.</p> <p>Water Crystals shall be commercially available slow release fertilizer containing soil wetting agent and water storing crystals pre-mixed through soil mixture at rate specified by Manufacturer.</p>
<b>TYPE D</b>	Tree planting in pavement -  Structural soil - substitution for root cells unit only where documented or where cells conflict with services path.	Benedict's Smart Mix#3 or approved equivalent
<b>TYPE E</b>	Palm tree planting	'Osmocote Tropical' mixed with growing media or approved equivalent
<b>TYPE F</b>	Turf underlay	Turf Underlay growing media as available from ANL or approved equivalent.
<b>TYPE G</b>	Turf top dressing	Organic Top Dressing supplied by ANL or approved equivalent.

### 8.4.6 Soil placement

Prior to placement of soil, the *contractor* shall ensure that all Mass Planting Beds and turf areas drain satisfactorily. Refer Section 8.3 – Landscape Subsoil Drainage.

Soil placed as fill in Mass Planting Beds shall be consolidated by foot, in maximum 75mm layers so as to minimise degree of future settlement. If future settlement occurs, the *contractor* is to allow for addition fill material to achieve design finish levels. Avoid differential subsidence and excess compaction.

No work shall be carried out on New Turf/ Mass Planting Beds / Bank Planting Areas whilst soil is wet, to avoid compaction of these areas.

The *contractor* shall produce a finished topsoil surface that has the following characteristics:

- Finish to design levels (25mm below finished surface level prior to installation of mulch)
- Soil depths in accordance with *SSC standard drawings*
- Smooth and free from stones or lumps of soil.
- Graded to drain freely, without ponding or concentration of flows to catchment points.
- Graded evenly into adjoining ground surfaces.
- Ready for planting

REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS.

## 8.5 Matting for erosion and weed control

Shall include the supply and installation of biodegradable matting for tubestock planting and mass planting beds on embankments (steeper than 1:4).

### 8.5.1 Materials

Mat Type	Application	Specification
TYPE A	Embankment planting for Erosion Control	Thick jute mat

<b>TYPE B</b>	Tube-stock planting for weed control	Thick jute mat
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### 8.5.2 Placement

Matting should be anchored appropriately based on specific site conditions and manufacturer's instructions. The edges of the erosion control matting shall be buried in a trench approximately 150-200 mm deep by 150 mm wide to prevent water flowing under the matting and provides maximum erosion protection. When installing matting down a slope, it is recommended, the upstream edge is buried and anchored in a trench to provide better protection from stream flow. Matting should have good contact with the soil surface and be secured with an appropriate number of pins for degree of slope.

Before rolling out the matting consider how the adjoining rolls of matting will be installed across the project site to allow for overlap by identifying the most influential forces acting on the matting (eg gravity on the upper-slope or hydraulic flow in the inter-tidal area). The number of joins in the matting should be minimised to increase the integrity of the matting and provide the strongest structure.

## 8.6 Root Management

Shall include the supply and installation of all root management solutions including Root Barrier.

### 8.6.1 General

Any damage to site work due to installation of tree root barrier shall be repaired at the expense of the *contractor*.

### 8.6.2 Materials

Type	Application	Description
Type 1	300 depth linear ribbed root barrier for use adjacent paths	ReRoot 300 by City Green or approved equivalent
Type 2	600 depth linear ribbed root barrier for use adjacent kerbs	ReRoot 600 by City Green or approved equivalent

### 8.6.3 Construction

The *contractor* shall excavate 100-150mm from hardscape edges so that top of barrier is 10-20mm above finished soil level. Place root barrier in trench, vertical ribs facing toward planting area and tree roots. Where possible, use adjacent hardscape as a guide for root barrier alignment. Backfill adjacent planting soil against the root barrier to promote clean fit to hardscape. Fill to finish grade per project specifications.

## 8.7 Planting works

Shall include the supply, setting out, planting, staking and fertilising of plants. All planting works shall be carried out by suitably qualified horticulturist.

### 8.7.1 Soil test prior to planting

The Contractor shall conduct a pH test prior to planting. If found not to be within acceptable pH range of 5.5 to 6.5, the *contractor* is to allow for additional soil conditioning to achieve these levels. Complete soil preparation shall be to approval of the *PDC*. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS.

### 8.7.2 Plant stock

Plant stock will be in accordance with the Plant Schedule, true to species or cultivar as named. Plant substitution is not acceptable unless approved by *Council's representative*.

Trees, shrubs and ground covers nominated on the drawings are to be supplied by the Contractor from a certified tree growing nursery. *Contractor* to take responsibility for all plant stock once received on site. *Contractor* must make note of north point reference upon delivery of trees, which must be followed upon installation of trees in the ground.

All tree stock shall be grown and selected in accordance with Australian Standard and NATSPEC guidelines. Plants at delivery shall be vigorous, well established, hardened off, of good form, consistent with species or variety, not soft or forced or root bound, free from diseases and insect pest, with large, healthy root systems and no evidence of having been restricted or damaged.

All mature street trees (100L pots or greater) shall have a single dominant trunk, with dominant trunk grown/clear of major branches at approx. 1.2m height or 1.8m when adjacent to high trafficable pedestrian thoroughfare. This does not apply to trees that are naturally multi-stems specimens as outlined in AS 2303.

*Contractor* must specify clear trunk requirement upon ordering tree stock. Trunk and stem pruning to be completed at the Nursery. Any trees in 100L pots or smaller requires formative pruning on site by qualified Arborist throughout the duration *Contractor's* maintenance period.

*Contractor* is to coordinate with Nursery to organise delivery of tree stock when tree pits are ready for planting. *Contractor* shall request Nursery to provide NATSPEC and Australia Standard certification to all tree stock with delivery to be submitted for Council's record. *Contractor* is to provide nursery with adequate notice for delivery times and stock inspection time so that planting holes are immediately ready for planting upon delivery of tree stock. The *contractor* shall ensure that all plant stock is inspected and approved by the *PDC* prior to planting. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS.

### **8.7.3 On-site storage**

All plant material shall be planted immediately after delivery to the site or heeled in or covered with moist soil or sawdust or stored as directed by *Council's representative*. Should the *contractor* require an on-site nursery for holding the plants prior to planting, it shall be a vermin proof compound of sufficient size with provision for watering of the plants.

All plants shall be adequately watered and protected from wind and sun.

### **8.7.4 Excavation for planting**

Contractor to plot services accurately prior to any major excavation, where services are encountered *contractor* must seek advice from the *Council's representative*. Extreme care shall be taken not to damage any roots of existing plants.

All pieces of timber and other debris shall be raked up from proposed Mass Planting Beds / Bank Planting and areas and transferred to separate stockpile, to be removed from site by Contractor at approved intervals. Prepared soil shall be allowed to cure prior to installing plants.

All tree drainage to be installed and connected to the appropriate inlet and outlet pipes as detailed. Tree pit shall be free draining. No water to be bogged or retained in tree pits or planting beds.

For holes dug by hand or backhoe, individual holes shall be excavated to a diameter of 400mm for container sizes up to 150mm diameter. Where larger plants are used, the holes must be at least twice the diameter of the container and at least 100mm greater than the depth of the container. Post hole borers shall not be used to

excavate planting holes. The sides of all holes shall be broken or loosened as necessary by means of a bar or other suitable tool to prevent confinement of root growth. Base of planting hole shall be loosened to a minimum depth of 150mm and a surface dressing of slow release fertiliser as noted below added to hole to manufacturer's recommendations and worked into loosened soil.

### 8.7.5 Planting

All plants shall be thoroughly watered immediately prior to planting.

Remove shrub and grassy plants from container with minimum disturbance to root-ball. Prior to planting tease out the roots at the base and around the sides of the root ball to eliminate pot bound roots and encourage lateral growth.

Remove or de-bag all trees from container and root prune the base and sides of the root ball to eliminate pot bound roots and encourage lateral growth. All planting *works* to be completed by qualified landscape *contractor*/Arborist or Horticulturist.

Plants shall be positioned in the centre of the hole, set plum and at such a level that, after firming and settlement, a normal and natural relationship of the plant with the ground surface will be established. Plant root systems must be moist at the time of removal from the containers and not allowed to dry out.

Hole shall then be backfilled with growing media as specified. On completion of planting *works* the base of each stem shall finish flush with soil surface level.

Contractor shall ensure that a 'pond' is not dug into clay subgrade material and that planting holes are free draining. Should Contractor not be satisfied with quality of existing soil into which plants are to be installed then Contractor shall immediately advise the *PDC* and await further instructions. The *contractor* shall ensure that plant species and quantities are in accordance with the contract drawings. Once installed, all plants shall be well watered and kept watered for duration of contract.

All advanced tree and palm stock shall be installed correctly with north mark (as provided from nursery) facing north upon installation.

Planting operations shall be suspended when directed by *PDC*, in periods of drought or when the soil is very wet or waterlogged or during periods of frost.

### 8.7.6 Palm tree planting

During the maintenance period, apply seaweed concentrate during spring and summer as per Manufacturer's recommendations. Palms shall be flooded twice a

week minimum during the establishment period (ie. The root ball must not be allowed to dry out during establishment period).

### **8.7.7 Staking**

Stakes shall be of durable hardwood, straight, free from knots or twists, and pointed at one end.

Ties shall be proprietary brand, purpose made, broad, flat webbing. Ties shall be fixed securely to the stakes.

Ties shall be positioned to support the tree between  $\frac{1}{4}$  and  $\frac{1}{2}$  of its height from the ground. The tension of the ties shall be such that the trunk is able to move to and fro at least 25mm at the point of support.

Stakes are to be driven to final level prior to the tree being positioned, or in such manner as to avoid damage to the root system of the tree.

Small deciduous trees (less than 2.5m) shall be tied to two stakes, 50mm x 50mm x 1.8m driven 600mm into the ground. All other trees in grassed areas shall be staked for marking purposes only using 25mm x 25mm x 1.2m stakes driven 600mm into the ground. Trees shall not be tied.

Shrubs in mulched shrub planting areas or beds need not be staked.

In mass planting areas, mark each tree planting line with timber stakes not taller than

1m placed at each break in the line and at intervals of 50m along the line. Each plant shall have a stake 25mm x 25mm x 1m long driven securely into the ground but no closer than 300mm to the planted tree.

In ripline planting areas, mark each ripline with timber stakes not taller than 1m placed at each break in the line and at every fifth tree along the line.

### **8.7.8 Fertiliser**

Fertiliser shall be a controlled release fertiliser with trace elements (Native Gardens for Natives or All Purpose for exotics).

Fertiliser shall be delivered to the site in standard sized bags showing weight, analysis and vendor's name, and be available for inspection on site.

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Fertiliser shall be applied at a rate in accordance with the manufacturer's instructions, at the time of planting and prior to the application of mulch within the watering basin.

Fertiliser shall be spread on the surface of the backfilling within the watering basin but not closer than 100mm to the stem or trunk of the plant.

### 8.7.9 Plant establishment

Ensure plants are regularly watered according to plant and environmental requirement from acceptance of plants' delivery through to planting, plant establishment, practical completion and during the maintenance period. The *contractor* shall replace damaged or failed plants with plants of the same type and size.

## 8.8 Tree planting in pavement

Shall include all tree pits which are constructed beneath a pavement or a load bearing ground surface such as a footpath, planted blister or road pavement, including Tree in Root Cells or Structural Soil. The *works* include excavation of the tree pit, supply and installation of materials, subsoil drainage connection to local stormwater outlet (including connection to roof watering system), and installation of plant material.

### 8.8.1 General

Refer to contract drawings for tree pit layout, dimensions and drainage connections for each tree pit and construction details.

The nominated volume of soil as approved and detailed on the drawings must be maintained and provided wherever possible so that the nominated tree can have the best growth opportunity when planted in an urban environment.

Note that tree pit length, width and height may be altered in-situ to avoid existing constraints (such as kerb and services) if required, subject to approval from *Council's representative*. Where the conflict occurs, replace root cell with structural soil mix to maintain structural integrity. Where more than 20% of root cell units are compromised or replaced with structural soil, tree pit size/volume shall be increased to compensate the loss. The revised tree pit extent in-situ shall be completed at Contractor's cost and approved by *Council's representative*. REFER SCHEDULE OF HOLD POINTS & CHECK POINTS.

### 8.8.2 Materials

This section includes the supply and installation of proprietary root cell products as specified below.

Note that standard supplier refers to accredited building product/landscape suppliers unless noted otherwise. *Contractor* may nominated equivalent product as substitution subject to approval by *Council's representative*. A sample and laboratory certificate from a NATA accredited laboratory (or SSC laboratory) shall accompany all soil mixes. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS

Material Type/Layer	Description	Supplier
Geotextile	Bidum A14	Standard
Drainage layer/trench	10mm one size washed Blue Metal aggregate wrapped with Geotextile	Standard
Subsoil drainage line	100mm slotted PVC Agline in filter sock (installed in drainage layer trench)	Standard
Root barrier	ReRoot1000 cut to suit detail	City Green Ph. 1300 760 642
Root cell module/unit	Stratavault 30 series for under footpath pavement  Stratavault 60 series for under road pavement	City Green
Establishment watering ring	65mm agline with filter sock connected to a surface inlet	Standard/City Green
Filter grid	Bi-axial filter layer	City Green

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Stormwater/roofwater distribution pipe	100mm diameter $\mu$ PVC pipe with necessary joints	Standard
Root director	RDC900	City Green
Pebble layer	10mm one size Blue Metal aggregate wrapped with Geotextile	Standard
Aeration/ watering ring	65mm agline with filter sock.  (With appropriate elbows & joint pipes where connected as water distribution pipes)	Standard/City Green
Surface inlet	Stainless steel square version to all inlet lid on pavement,  or  Plastic round version to all inlet lid in garden bed/mass planting bed	City Green
Jointing tape	ReRoot Jointing Tape	City Green
Root cell soil mix	Refer Soil types (Section 8.4.4)	
Structural soil	Refer Soil types (Section 8.4.4)	

### 8.8.3 Tree in root cells – Construction methodology

The nominated sub*contractor* who is installing the tree pits shall complete an initial tree pit installation training session with City Green prior to any tree pits being installed. *Contractor* shall coordinate installation training date with the *PDC*. Refer to <http://www.citygreensystems.com/> for the most recent installation guide. REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS.

Excavation of tree pits and installation of Drainage layer, Root Cells, Soil Mix, Geo textile, Pebble Layer, Aeration/Watering pipe must take place prior to laying the

concrete base/working slab and/or kerb where tree pits are shown to extend under road pavement on *approved design drawings*.

Contractor to install tree and associated tree pit as setout and detailed on *approved design drawings*.

Contractor will nominate a methodology, including approximate timeline prior tree pit works. Note that the proposed tree pits may extend below road/parking lane as shown on drawings.

Example of tree install in root cell methodology is outlined below:

1. Mark out the tree pit dimensions on site and identify any conflicts with services.
2. Excavate the entire tree pit extent to the dimension as detailed. Where tree pit extent is altered, nominated soil volume of tree pit will be maintained to best suit altered tree pit dimension (*Council's representative* approval required).
3. Ensure that a 'pond' is not dug into subgrade material and that planting holes are free draining with the base grading down to the subsoil drainage line as detailed on drawing. Lay Root Barrier and position Subsoil Drainage line & trench on the base of pit as detailed and provide 1% fall to storm water pit connection.
4. Ensure the top surface of drainage layer (where root cells are placed) is plumb/level horizontally. It is crucial that this layer is plumb to allow root cell unit to fit securely. Install Root Cell Units according to Manufacturer's instruction, starting from the centre (tree setout) and work outwards to the extent of pit as detailed.
5. Backfill tree pit with soil as detailed up to the top of root cell units. Soil will be placed in 80mm layers so as to minimise degree of future settlement. Allow installation of watering ring & aeration ring at the correct level as detailed. Any excess excavated area not supported by root cells must be filled with structural soil, to ensure structural strength of surface pavement above can be retained.
6. Where required, place structural soil at the base of planting hole and compact by hand to form a pad for the new tree to be supported at the nominated finished design level.

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7. All soil mix will be allowed to settle naturally over minimum 48 hours period. Over 48 hours, settlement is expected to occur and additional fill (root cell soil mix as detailed) material will be allowed to achieve design finish levels.
8. Place Filter Grid sheet and Root Director as detailed and secure according to Manufacturer's instruction.
9. Place tree to fit inside the secured root director and in the planting hole, ensure north tag is facing the north orientation of the site and set tree plumb. Where tree rootball is expected to conflict with services on site, the base of pot (soil & roots) shall be loosened and if required roots may be trimmed with a certified Arborist's recommendation.
10. Upon tree placement, backfill inside root director with soil mix as detailed.
11. Install pebble layer as detailed.
12. Install working slab and pavers as detailed. Planting areas will be kept clear from cement run-off or slurry at all times. Planting soil and planting hole must not be contaminated.
13. For mass planting area, backfill with soil as specified and as detailed. If soil has settled around tree planting area (within root director) top up as required taking care not to overfill around the base of trunk. Soil level should not be higher than the original soil level of the tree container. If tree has settled significantly >50mm of the desired design level, tree placement must be adjusted.
14. Install tree surround/finishes as detailed and as per manufacturer's instruction.

(REFER SCHEDULE OF HOLD POINTS AND CHECK POINTS).

### **8.8.4 Tree in structural soil**

Refer *SSC standard drawings*.

### **8.8.5 Watering**

Trees should be watered regularly to ensure the root ball and crown does not dry out. After finished installation of tree on pavement, the tree can be watered at grate opening and through grate vents. Contractor is responsible for the supply of water to plants from planting until completion of the maintenance period – Refer Section 8.14.

## 8.9 Mulching

Mulching shall include the supply and installation of mulch to the surface of all Mass Planting Beds as indicated on the *approved design drawings*.

### 8.9.1 Materials

Sample of mulch shall be provided to *PDC* prior to installation.

REFER SCHEDULE OF HOLD POINTS & CHECK POINTS.

Type	Application	Material
Type A	Mass Planting Beds	Forest Blend by Australian Native Landscapes or equivalent.  (Hard wood chip mulch may be used in location of high wind only)
Type B	Mass Planting Beds adjacent bushland	

### 8.9.2 Construction

Following planting, apply 75mm depth of approved mulch to the surface of all of Mass Planting Beds. Mulch shall cove down to finish flush with containing edges and shall be reduced to 25mm thick over root ball of each plant.

## 8.10 Turfing

Shall include the supply and laying of turf and turf underlay. Refer Section 8.4- Soilworks for preparation of surface layer.

### 8.10.1 General

The *contractor* shall obtain turf from a specialist grower of cultivated turf. Provide turf of even thickness, free from weeds and other foreign matter.

The turf shall be delivered to the site within 24 hours after being cut and installed within 36 hours after being lifted from the nursery, unless otherwise permitted.

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When turf is stored prior to laying, it shall be placed in a cool shaded location or covered with wet hessian. When there is a delay of more than 36 hours after lifting, roll out turf on a flat surface with grass up and water as necessary to maintain good condition. Turf shall not be allowed to dry out at any stage from lifting to laying.

### 8.10.2 Materials

TURF shall be true to species specified in the design drawings.

TURF UNDERLAY & TOPDRESSING – refer to Section 8.4.4 – Soil types.

### 8.10.3 Fertiliser

Fertiliser shall be delivered to the site in standard sized bags showing weight, analysis and vendor's name, and be available for inspection on site.

Fertiliser shall be applied at a rate in accordance with the manufacturer's instructions, at the time of laying turf.

### 8.10.4 Laying turf

The contract shall lay the turf using the following methodology:

- Commence turf laying against the longest straight line boundary. Butt and push ends and edges against each other tightly without stretching or tearing the turf. Gaps and overlaps must be avoided. Joints in rows must be staggered and a sharp knife used to trim around obstacles (posts, sprinklers, paths, etc.) The *Contractor* shall avoid the use of off-cuts or small strips at outer edges, as they will not retain moisture.
- Turf must be laid flush against existing grass or paved edges.
- Rolls shall be laid across steep slopes, rather than up or down the slope, unless otherwise directed by Council. Turf should be pegged until rooted to avoid slippage on steep slopes or batters.
- Laid turf must be dampened, tamped and/or gently rolled to establish good contact with the soil. Gaps shall be filled with loose soil, to reduce air pockets.
- The *Contractor* shall avoid all unnecessary walking or kneeling on newly laid, or freshly watered turf, to avoid indentations.
- Depending on weather conditions, watering of newly laid turf must occur no later than 2 hours after being laid, and as a guide, a minimum of 25 mm is to be applied.

### 8.10.5 Turf establishment

The *contractor* shall maintain turfed areas until the attainment of a dense continuous sward of healthy grass over the whole turfed area, evenly green and of a consistent height. Lift failed turf and relay with new turf. Where levels have deviated from the design levels after placing and watering, lift turf and regrade topsoil to achieve design levels.

### 8.11 Existing grassed areas

The *contractor* shall maintain existing grass within the Contract area. Areas of existing grass to be retained are to have existing tree stumps removed and Turf made good.

Apply 25mm Topsoil to areas of existing turf. *Contractor* is to ensure that any dips or undulations in existing turf are filled with Turf Underlay to produce an even surface.

### 8.12 Edging

Edging shall include all stone, concrete and timber edge to garden areas and tree in grass areas. Refer Section 9 – Furniture & Fixtures.

### 8.13 Tree guards

Shall include all tree guards in mass planting areas, tree pits in pavement and tree in grass areas. Refer Section 09 – Furniture & Fixtures.

### 8.14 Restoration of stockpile sites

Refer Section 02 - Earthworks

### 8.15 Final Inspection

Prior to requesting a final inspection, *Contractor* shall make good any damaged areas. *Contractor* shall leave all areas over which Contractor has worked in a clean and tidy condition, clean from ingrained dust and debris, and to the satisfaction of the *PDC*. *Contractor* shall be responsible for removal from site of all unwanted material and debris resulting from this work.

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The Contractor shall ensure that all finishing treatment to all items of *works* are completed, this includes sealing of pavement and timber product as per its corresponding manufacturer's recommendation.

The *contractor* shall notify the *PDC* and *Council's representative* of progress and arrange a final inspection.

### 8.16 Maintenance of landscape works

Maintenance of landscape works shall include the establishment and maintenance of plants, planted areas, new turf and existing grass areas within the maintenance period as defined in the contract documents.

The *Contractor* shall maintain the site for a period of 24 months beginning at practical completion, unless specified otherwise in the contract documents.

During the maintenance period, plants installed under this contract shall be properly watered, cultivated, weeded, pruned, and treated for insects and pests. Timing of maintenance works shall be spread regularly over maintenance period. Planted areas shall be kept free of litter, trash, surplus soil, and otherwise objectionable materials. Any plants or planted areas which are diseased, dead, or in an unhealthy condition shall be replaced by the *Contractor* at the *Contractor's* expense within 2 weeks after notification by the *PDC*. Plants must be replaced with the same species and size to those originally specified.

Trees and vines shall be pruned as necessary to balance foliage and remove dead branches. Vines shall be checked to insure leaders are adhering to wall surfaces. A 1m diameter area around each tree, shrub, or vine shall be kept weed free. Weeds and grasses shall be hand pulled before reaching a 30cm height.

New turf areas shall be regularly mown. Replace all areas where the turfs have failed to provide a healthy grass cover. The *contractor* shall protect the newly laid areas against trespass and traffic until the grass is well established.

Remove stakes from newly planted trees after the completion of their first growing period. Take care not to cause any damage to the trees.

Mulch and growing media shall be reinstated as necessary to maintain specified depth.

The *contractor* shall maintain a hard copy record of maintenance activities from commencement of Maintenance period. *Council's representative* may request viewing of maintenance record at any time without early notice.

A final inspection will be conducted at the end of the maintenance period. Prior to the final inspection, the *contractor* shall have performed final fertilising, weeding, repair or replacement of unhealthy plants, and a thorough cleaning of planted areas. REFER SCHEDULE OF HOLD POINTS & CHECK POINTS.

## 8.17 Quality

### 8.17.1 Schedule of hold points and check points—Landscape

All Hold Points and Check Points in this section of the *specification* shall be carried out by a *PDC* in Landscape Construction (as defined in Section 1 – Preliminaries) unless otherwise specified.

<b>1. Work Process:</b>	<b>Landscape Subsoil Drainage</b>
Hold Point or check point:	<i>Check point – PDC</i>
<i>Required Notice</i>	By arrangement with <i>PDC</i>
<i>Required Action:</i>	Prior to backfilling, the <i>contractor</i> will provide notification and evidence that the excavation and drainage is installed according to the <i>specification</i> .
<b>2. Work Process:</b>	<b>Excavation and subgrade preparation for mass planting beds</b>
Hold Point or check point:	<i>Check point – PDC</i>
<i>Required Notice</i>	By arrangement with <i>PDC</i>
<i>Required Action:</i>	The <i>Contractor</i> will provide evidence that the excavation and subgrade preparation for mass planting is adequately prepared and will provide sufficient soil depth.

<b>3. Work Process:</b>	<b>Supply of soil</b>
<i>Hold Point or check point:</i>	<i>Check point – PDC</i>
<i>Notice:</i>	By arrangement with <i>PDC</i>
<i>Action:</i>	Prior to spreading soil, the <i>contractor</i> will provide samples and certificate(s) for all soil types
<b>4. Work Process:</b>	<b>Soil placement</b>
<i>Hold Point or check point:</i>	<i>Check point – PDC</i>
<i>Notice:</i>	By arrangement with <i>PDC</i>
<i>Action:</i>	The <i>contractor</i> will provide evidence that soil is in place to a suitable depth.
<b>5. Work Process:</b>	<b>Soil test</b>
<i>Hold Point or check point:</i>	<i>Check point – PDC</i>
<i>Notice:</i>	By arrangement with <i>PDC</i>
<i>Action:</i>	The <i>contractor</i> will provide certificates that the soil's pH is suitable.
<b>6. . Work Process:</b>	<b>Supply of Plant stock</b>
<i>Hold Point or check point:</i>	<i>Check point – PDC</i>
<i>Notice:</i>	By arrangement with <i>PDC</i>
<i>Action:</i>	The <i>contractor</i> will provide notification that the plants have been delivered on site.

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<b>7. Work Process:</b>	<b>Tree in Root Cells - Root Cell installation training</b>
<i>Hold Point or check point:</i>	<i>Check point – PDC</i>
<i>Notice:</i>	By arrangement with <i>PDC</i>
<i>Action:</i>	The <i>contractor</i> will submit evidence of their training and manufacturer recommendations.
<b>8. Work Process:</b>	<b>Tree in Root Cells - Revised extent or use of Structural Soil</b>
<i>Hold Point or check point:</i>	<i>Hold point – Council’s representative</i>
<i>Notice:</i>	By arrangement with <i>Council’s representative</i>
<i>Action:</i>	The <i>Council’s representative</i> will inspect the first tree pit prior to the <i>contractor</i> proceeding with any change of materials or revised extent .
<b>9. Work Process:</b>	<b>Tree Planting in Pavement</b>
<i>Hold Point or check point:</i>	<i>Check point – PDC</i>
<i>Notice:</i>	By arrangement with <i>PDC</i>
<i>Action:</i>	The <i>contractor</i> shall provide evidence that each tree pit has been constructed in accordance with the Construction methodology outlined including tree pit excavation, root barrier and drainage, tree placement and backfilling.

<b>10. Work Process:</b>	<b>Final Inspection of landscape works</b>
<i>Hold Point or check point:</i>	CHECK POINT – <i>PDC</i>
<i>Notice:</i>	By arrangement with <i>PCA</i>
<i>Action:</i>	The <i>contractor</i> shall notify the <i>PDC</i> and <i>Council's representative</i> of progress and arrange a final inspection.
<b>11. Work Process:</b>	<b>Maintenance of Landscape Works</b>
<i>Hold Point or check point:</i>	<i>Hold point – Council's representative</i>
<i>Notice:</i>	By arrangement with <i>Council's representative</i>
<i>Action:</i>	<i>Council's representative</i> will carry out a final site inspection and review the submitted documentation, prior to authorising the release of the Hold Point.