

ROADS AND MARITIME SERVICES (RMS)

QA SPECIFICATION R179

LANDSCAPE PLANTING

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REVISION REGISTER

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Ed 1/Rev 0		New specification	GM, IC	15.10.08
Ed 1/Rev 1	1.3	Definitions of “you” and “your” added.	GM, IC	07.08.09
	1.5	OHS legislation details updated.		
	2.8	Name of Government Authority and contact details updated.		
	Annex M	Referenced Documents updated.		



LANDSCAPE PLANTING

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FOREWORD

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REVISIONS TO PREVIOUS VERSION

This document has been revised from RMS Specification R179 Edition 1 Revision 0.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

PROJECT SPECIFIC CHANGES

Any project specific changes have been indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

RMS QA SPECIFICATION R179

LANDSCAPE PLANTING

1 GENERAL

1.1 SCOPE

This Specification sets out the requirements for landscape works including site preparation, supply and planting of containerised plant materials (including mulching, fertilising and staking), turfing, watering and maintenance after planting.

1.2 STRUCTURE OF THE SPECIFICATION

This Specification includes a series of annexures that detail additional requirements.

1.2.1 Details of Work

Details of work are shown in Annexure R179/A.

1.2.2 Measurement and Payment

The method of measurement and payment must comply with Annexure R179/B.

1.2.3 Schedules of HOLD POINTS and Identified Records

Annexure R179/C lists the **HOLD POINTS** that must be observed. Refer to Specification RMS Q for the definition of **HOLD POINT**.

The records listed in Annexure R179/C are Identified Records for the purposes of RMS Q Annexure Q/E.

1.2.4 Referenced Documents

Unless otherwise specified the applicable issue of a reference document other than an RMS Specification shall be the issue current at the date one week before the closing date for tenders or, where no issue is current at that date, the most recent issue.

Standards, specifications and test methods are referred to in abbreviated form (e.g. AS 1289). For convenience, the full titles are given in Annexure R179/M.

1.3 DEFINITIONS

The following interpretations apply to terms used in this Specification:

Post-completion Maintenance Period: The period commencing immediately upon completion of landscape planting, or when the Principal commences using or occupying the whole of the Works, and the landscape planting maintenance tasks post-construction as described in this specification are required.

Low shrub: A shrub whose mature height is unlikely to exceed 1.5 m.

Large shrub: A shrub which is likely to have a mature trunk diameter exceeding 50 mm.

Tree: A tall perennial woody plant having a main trunk and branches forming a distinct elevated crown; includes both gymnosperms and angiosperms.

Weed: Weed species include but are not necessarily limited to those listed by the relevant local government authority as noxious categories W1, W2, W3, or W4 under the Noxious Weeds Act 1993. Also included under this definition are agricultural and horticultural weed species and in particular:

- (a) Invasive grasses such as *Chloris gayana* (Rhodes Grass), *Phalaris* sps., *Eragrostis curvula* complex (African Lovegrass), *Andropogon virginicus* (Whisky Grass), *Nassella trichotoma* (Serrated Tussock), *Cortaderia selloana* (Pampas Grass) and *Sporobolus africanus* (Giant Parramatta Grass);
- (b) Annual and perennial weeds include *Biden pilosa* (Farmer's Friend), *Conyza albida* (Fleabane), *Ageratina adomorphora* (Crofton Weed), *Sida rhombifolia* (Paddy's Lucerne), *Verbena bonariensis* (Purpletops), *Keinus communis* (Castor Oil Plant), *Cirsium vulgare* (Scotch Thistle), *Baccharis halimifolia* (Groundsel Bush), *Trifolium repens* (White Clover), *Trifolium fragiferum* (Strawberry Clover), *Ligustrum lucidum* (Large Leaf Privet), *Ligustrum sinesse* (Small Leaf Privet), *Cassia bicapsularis* (Butterfly Bush), *Taraxacum officinale* (Dandelion), *Lantana camara* (Latana), *Nothoscordum gracile* (Onion weed), *Foeniculum vulgare* (Fennel), *Chrysanthemoides monilifera* (Boneseed), *Datura stramonium* (Thornapple), *Polygonum aviculare* (Wire Weed), *Araujia hortaorum* (Mothvine), *Rubus fruticosus* (Blackberry), *Portulaca oleracea* (Pigweed), *Persicaria capitata* (Knotweed), *Euphorbia peplus* (Caustic Weed), *Cerastium glomeratum* (Chickweed), *Hypochoeris radicata* (Catsear), *Genista monspessulana* (Bloom) and *Gomphocarpus fruticosus* (Cotton Bush).

Where necessary, advice must be sought from the Principal's Landscape Technologist in order to determine whether the type and/or proportion of weed cover is significant for the purposes of this definition.

Weeds may include environmental weeds.

Environmental Weed: Plant species including Australian native species which are outside their natural range or habitat such as *Acacia saligna*.

All slopes stated in this specification are in the ratio of horizontal to vertical distance.

The terms "you" and "your" mean "the Contractor" and "the Contractor's" respectively.

1.4 TRADESPERSON AND PROJECT TRAINING

All work specified must be carried out by competent Landscape Tradesperson/s with experience in landscape construction and planting and supervised by your Landscape Supervisor, who must possess the NSW TAFE Landscape Trade Certificate or equivalent as a minimum qualification.

At inception of the project and prior to commencement of the Landscape Planting operations, have all your Landscape Tradespersons and Landscape Labourers for the project attend a Training Day carried out by your Landscape Supervisor, to gain basic skills and the operational and safety standards required for the performance of this Specification in Landscape Planting.

The Training Day must be undertaken on site and must involve the attendance of the RMS Landscape Technologist as the Principal's Representative.

1.5 OCCUPATIONAL HEALTH AND SAFETY

Carry out all work in accordance with Specification RMS G21 or RMS G22 and the NSW Occupational Health and Safety Act, 2000 and its Regulations and Codes of Practice. In particular, comply with the requirements of the OHS Regulation 2001 and the Code of Practice for the Safe Use and Storage of Chemicals (including Pesticides and Herbicides) in Agriculture 2006.

Prepare and implement a Hazardous Substances Plan that includes:

- (a) a hazardous substance register which contains Material Safety Data Sheets (MSDS), risk assessment forms, records of pesticide/herbicide usage and details of the controls which are used;
- (b) health surveillance measures for all personnel using pesticides and herbicides;
- (c) procedures for safe storage and disposal of pesticides and herbicides; and
- (d) training of all personnel using pesticides and herbicides to implement the measures prescribed in the Code of Practice for the Safe Use and Storage of Chemicals (including Pesticides and Herbicides) in Agriculture 2006 before using these substances.

1.6 CONTROL OF TRAFFIC

Landscaping works which are in close proximity to the road traffic require appropriate traffic control complying with Specification RMS G10.

2 MATERIALS

2.1 FERTILISER

Fertiliser must be a slow-release type in tablet form with an 8 to 9 months release period, and having an N:P:K analysis (stated in elemental form) as follows:

- (a) N: 20%
- (b) P: 4%
- (c) K: 8%

Fertiliser must be delivered to the site in unopened bags or containers bearing the manufacturer's description, analysis and quantity of its constituents. Test the fertiliser for conformity of constituent elements prior to using the fertiliser in the work and submit the test certificate to the Principal.

2.2 WOODCHIP MULCH

Woodchip mulch used in landscape planting must, to the extent possible, be derived from trees and shrubs removed during the clearing and grubbing works on the site. If the mulch produced in this way is insufficient, make up the shortfall by using imported hardwood chip.

Hardwood chip must comply with the following requirements:

- (a) Hardwood chip must only be derived from waste hardwood timber. Woodchip derived from trees which have been specifically harvested for that purpose will not be accepted under any circumstances;
- (b) The source of hardwood chips must be provided in writing to the Principal;
- (c) The material must comprise hardwood chips with not more than 5% fines by volume, and must not contain any bark;
- (d) The average size of the woodchip must be approximately 30 mm x 20 mm x 5 mm and the maximum length of chip must not exceed 50 mm;
- (e) Hardwood chip must be free of soil, weeds, stones, vermin, insects or other foreign material.

Prior to use, test the woodchip for conformity with these requirements and submit a sample to the Principal for approval.

Do not use-tub ground mulch unless otherwise directed by the Principal.

2.3 PLANT MATERIALS

2.3.1 Principal Supplied Plant Materials

Principal supplied plant materials as listed in Annexure R179/A or as detailed elsewhere will be supplied by a nursery nominated by the Principal.

Provide the nominated nursery with a program of works to ensure that Principal supplied plant materials are available and have been suitably "hardened off" at the time that they are required.

You are responsible for the collection and transportation of the plants to the site.

2.3.2 Contractor Supplied Plant Materials

Contractor supplied plant materials must be grown by a nursery in a local area of similar climate to the Works.

The proposed nursery subcontractor must be approved by the Principal. The request for approval must include the location of the nursery, and the plant materials which will be supplied from the nursery.

Do not substitute any species without the Principal's approval. All plant materials must be true to species and sizes. They must be well grown, of good form, not soft or forced and with large healthy root systems. They must not be root bound and must be free from disease and insect pests. Trees must have a single leading shoot.

Plants must be “hardened off” four weeks prior to delivery to the site.

2.3.3 Container Size and Plant Height

Plants supplied must be in the container sizes and within the approved plant heights specified in Table R179.1.

Table R179.1 – Container Size and Plant Height

Plant Size	Container Size	Approved Plant Height
‘Viro-Tube’	50 mm x 50 mm x 90 mm deep	200 mm - 300 mm
‘Forestry Tube’	50 mm x 50 mm x 125 mm deep	300 mm - 400 mm
‘Semi Advanced’	150 mm x 150 mm x 150 mm deep	300 mm - 400 mm
‘Advanced’	200 mm x 200 mm x 200 mm deep	400 mm - 500 mm
‘Super Advanced’	25 L - 45 L container size	2 000 mm - 2 500 mm
‘Semi Mature’	75 L - 100 L container size	2 000 mm – 3 000 mm

2.4 STAKES AND TIES

Timber stakes must be hardwood and sharpened to a point at one end. The size of timber stakes, and the number required per plant must be in accordance with Table R179.2.

Table R179.2 – Timber Stakes

Plant Size	Timber Stake Size	Number of Stakes
‘Advanced’	25 mm x 25 mm x 1 500 mm long	1
‘Super Advanced’	38 mm x 38 mm x 1 800 mm long	2
‘Semi Mature’	50 mm x 50 mm x 2 400 mm long	3

Bamboo stakes may be used in place of hardwood, and must be 15 mm in diameter and 750 mm long.

Ties must be 50 mm wide hessian webbing.

2.5 SOIL ADDITIVE FOR PLANT ESTABLISHMENT

Soil additive must be a dry granular mixture, comprising water absorbent polymers, organic and mineral fertilisers, trace elements, carrier material and growth stimulators and must be incorporated into the excavated planting hole during planting operations in accordance with the manufacturer’s recommendations.

Table R179.3 – Quantity of Soil Additive

Plant Size	Quantity
‘Viro-Tube’	Nil
‘Forestry Tube’	20 grams
‘Semi Advanced’	40 grams
‘Advanced’	80 grams
‘Super Advanced’	400 grams
‘Semi Mature’	One kilogram

2.6 WEEDMAT

Weedmat must be a 100% organic fibre type. Nominal thickness of the mat must be 6 mm with a density of between 600 and 650 grams per square metre.

For individual planting, the dimensions of the weedmat must be:

- (a) Forestry and Semi Advanced: 370 mm x 370 mm square
- (b) Advanced (200 mm dia.): 600 mm x 600 mm square
- (c) Super Advanced (> 25 L): 1 000 mm x 1 000 mm square

For mass planting in mulched beds, use whole rolls of weedmat and install them in accordance with the manufacturer’s recommendations.

2.7 TREE GUARDS

Standard tree guards must be green plastic type tree guards 350 mm dia. x 450 mm long, and each tree guard must be secured with three bamboo stakes.

Bamboo stakes for “standard green” tree guards must be 750 mm long.

2.8 HERBICIDES AND PESTICIDES

Herbicides and pesticides must be currently registered for their intended use by the Australian Pesticides and Veterinary Medicines Authority (APVMA).

Information on registered herbicides and pesticides may be obtained from the APVMA Internet website www.apvma.gov.au.

2.9 WATER

Water applied to plants must be potable or obtained from a source which does not contain toxins, pollutants or any substance which would adversely affect the growth of any of the plants to be watered.

When the use of non-potable water is proposed, test the source and prior to its use for watering, provide the Principal with verification that the water is free of toxins or pollutants or substances which would adversely affect the growth of plants to be sown.

2.10 TURF FOR SPECIFIC LAWN AREAS ALONG MEDIANS AND ROADSIDES

Turf for specific lawn areas along medians and roadsides must be *Zoysia* 'Empire' or equivalent.

Selected turf must be 25 mm thick of dense, well rooted grass. Turf must be verdant and fresh when delivered and be free of weeds, soil pests and disease and must be accompanied with a "Certificate of Authenticity" from the supplier. The turf must be mown and freshly cut in long lengths, of uniform width not less than 300 mm, and in sound unbroken condition.

2.11 TURF UNDERLAY

Turf underlay used must be topsoil material, but may be general purpose topsoil in accordance with Specification RMS R178.

The soil mix must not contain any of the following:

- (i) materials toxic to humans and plant health;
- (ii) plant roots of diameter greater than 12 mm;
- (iii) clay lumps; and
- (iv) stones greater than 10 mm size.

2.12 IMPORTED ORGANIC TOPSOIL

Imported organic topsoil must be a weed-free "organic type" soil mix that conforms to AS 4419 and suitable for the culture of plant material in landscape areas. It must:

- (a) be of a friable porous nature;
- (b) contain no refuse or materials toxic to plant growth;
- (c) contain no stumps, roots, clay lump or stones larger than 25 mm in size;
- (d) have an organic content of at least 15% to 20% by mass as determined by the method specified in AS 1289 D1.1 Part D;
- (e) have a pH in the range of 5 to 6.5 when tested in accordance with RMS T123;
- (f) have a soluble salt content not exceeding 0.06% by mass;
- (g) be suitable for phosphorus sensitive plants; and
- (h) be free of weed and weed refuse material.

Provide a sample of the soil to the Principal for inspection and approval.

2.13 TIMBER EDGING

Timber edging shall be 50mm x 100mm sawn Pinus radiata or as otherwise indicated on the drawings and shall be C.C.A. (Copper-chrome-arsenic) pressure treated in accordance with AS 1604. Timber shall be placed on edge and secured to 50mm x 50mm chisel pointed pegs of the same timber. Pegs shall be driven on alternate sides of the edging at 2m maximum centres to a minimum depth of 400mm and with tops finished 25mm, below top of edging. Fix edging to each peg with two 90mm galvanised 'tek' screws driven from the edging into the pegs. The top of edging shall run true to finished surface levels.

Edging shall be saw cut as necessary to facilitate bending. The tightest radius for any curved edging shall be 1200mm and lengths of curved edging shall be fixed at both ends to pegs as specified above.

Each length of edging shall be fixed to at least four pegs and adjacent lengths shall butt neatly. The minimum length of timber for edging shall be 1200mm.

Timber edging must be treated pine of size 100 mm x 25 mm or 100 mm x 50 mm, supported by pegs of size 25 mm x 50 mm x 300 mm at 2.0 metre centres.

2.14 CONCRETE EDGING

Concrete edging must be 150 mm x 75 mm wide, formed concrete.

2.15 VEGETABLE DYE

Dye used in herbicide spraying must be a biodegradable, red coloured vegetable dye.

3 PLANTING OPERATIONS

3.1 TIMING

Unless otherwise directed by the Principal, carry out planting within seven (7) days of site seeding operations, to avoid unnecessary disturbance to areas of existing vegetation and to areas of the works previously topsoiled and/or seeded, hydroseeded or hyromulched.

Do not carry out planting in dry soil in hot and dry weather conditions unless otherwise directed by the Principal.

3.2 TRANSPORT AND STORAGE OF PLANTS

Inspect all plants at the time of delivery and reject any plants which do not comply with the Specification.

Ensure that due care is taken in the transportation of plants to and from the site holding area. Undertake the loading, transportation and unloading of plants from holding areas to planting sites in a manner that cause minimal disturbance to the rootball and the overall stability of the plants.

Prior to and during planting, maintain the plants' root systems moist at all times, particularly during the period when the plants are stored on site.

Store plants in an area protected from wind, dust and vermin and with adequate water supply.

The Principal may reject plants suffering from stress or which have been damaged, due to neglect and/or mishandling. Rejected plants must be replaced at your own expense.

3.3 PRESERVATION OF EXISTING VEGETATION

Preserve and protect existing vegetation except where otherwise specified or directed.

Protective measures for existing vegetation include:

- (a) minimising machinery movement over and disturbance to seeded and vegetated surfaces and surfaces adjacent to existing trees;
- (b) keeping deleterious material including oil, petrol, cement, bitumen, spillage from washing operations and similar contaminants clear of trees, shrubs and grass including their root systems;
- (c) no stockpiling of materials over root systems; and
- (d) avoiding damage to overhead tree canopies by machine or truck operations.

Organise planting work and methods so as to minimise damage to surface vegetative work already completed under the Contract.

Rectify any damage to existing vegetation caused by your landscape planting operations or associated works at your expense.

3.4 SETTING OUT

Set out the positions of all planting areas (trees and shrubs) in accordance with the Landscape Drawings, or as directed by the Principal.

Except where otherwise shown on the Drawings:

- (a) do not plant trees or shrubs within 2.5 m of any pavement edge;
- (b) plant only low shrubs and ground covers within 2.5 m of a safety barrier;
- (c) do not plant trees or large shrubs within the clear zone shown on the Drawings or, where no clear zone is shown, within 10 m of any pavement edge, except where otherwise shown on the Landscape Drawings and approved by the Principal;
- (d) do not plant trees or shrubs at locations where the trees or shrubs, at maturity, are likely to obstruct any road sign from the drivers' view; and
- (e) do not plant trees or shrubs which, at maturity, will exceed 1.5 metres in height under an electricity transmission line or be so close to the line that the mature canopy will come within 5 metres of any conductor.

HOLD POINT

Process Held: Commencement of Planting Operations

Submission Details: Notify the Principal, not less than 2 working days prior to the intended time for commencement of planting operations, that the setting out of all tree, shrub and ground cover planting positions is complete and available for inspection

Release of Hold Point: The Principal may inspect set out for the positions of all trees and shrubs prior to release of the Hold Point

3.5 PREPARATION

3.5.1 Weed Removal and Application of Herbicides and Pesticides

Where weed infestation occurs, take the following action before clearing planting areas:

- (a) for those species listed by the relevant local government authority as noxious categories W1, W2, W3, or W4 under the Noxious Weeds Act 1993, take action as required by the Act and the local government authority, and
- (b) for all other species, spray with herbicide.

Use an appropriate herbicide or pesticide for the intended purpose subject to the specific requirements of the relevant local government authority. The choice of herbicide or pesticide used must be based on health and environmental considerations.

Use herbicides and pesticides in accordance with the manufacturer's directions supplied with the product.

Before spraying, follow RMS Pesticide Use Notification Plan and comply with the requirements of Specification RMS G34M, G35 or G36 on public notification of pesticide use.

The operator must wear protective clothing and equipment when mixing and using herbicides and pesticides.

The Principal may direct that the area to be treated for weed infestation be extended beyond the area to be revegetated.

A biodegradable red dye is to be included in the herbicide spray. The dye content used must be sufficient to ensure that the treated areas can be identified.

Do not spray herbicide in windy weather (wind of 10 km/hr or greater) or within such distance of a watercourse which would permit the herbicide to enter the water.

Areas sprayed with herbicide must remain undisturbed for two weeks or as recommended by the manufacturer, whichever is the longer period. Follow up with a second herbicide spray to ensure complete removal of weeds.

Unused herbicide and pesticide and empty containers must be used elsewhere, recycled or safely disposed of.

3.5.2 Clearing for Planting

Clear the following areas by slashing down to a height of not more than 100 mm:

- (a) for mass planting in mulched beds, the areas of the mulched beds, and
- (b) for individual plantings, the area of each planting copse,

together with a perimeter area 1.5 m wide.

Remove, recycle or dispose of all slashings in a legally and environmentally responsible manner from the site. Spray all planting areas with approved herbicide and leave for two weeks before commencing excavation.

3.5.3 Cultivation

After weed removal by slashing and spraying operation, cultivate as follows:

- (a) **Mass planting in mulched bed:** Cultivate all mulched areas for mass planting to a depth of 200 mm by tractor mounted rotary hoe or similar equipment. Remove weeds, stumps, roots, clay lumps and stones greater than 50 mm and all other extraneous material not conducive to optimum plant growth. Place 100 mm deep organic topsoil over the areas to be planted. Rake

the areas to provide an even surface for the installation of the weedmat. Final soil surface levels must be 75 mm below top of kerb or footpath;

- (b) **Individual planting in copse:** Where individual planting is to be carried out on slopes of 3 to 1 gradient or flatter, rip the copse area to a depth of 400 mm along each line of planting with tractor mounted tynes set at 300 mm centres. Each line of planting requires two passes with the second pass in the opposite direction to the first.

3.6 PLANTING

3.6.1 Planting Holes

Excavate planting holes to the dimensions as specified in Table R179.4.

Table R179.4 – Planting Hole Dimensions

Plant Size	Planting Hole Dimensions (mm)
'Viro-Tube'	60 x 60 x 150 deep
'Forestry Tube'	200 x 200 x 200 deep
'Semi Advanced'	300 x 300 x 300 deep
'Advanced'	400 x 400 x 400 deep
'Super Advanced' – 35 L	600 x 600 x 600 deep
'Semi Mature' – 75 L	1,000 x 1,000 x 1,000 deep
'Semi Mature' – 100 L	1,000 x 1,000 x 1,000 deep

Excavate the holes by hand tools or backhoe. Do not use an auger or similar implement which will result in compacted and glazed hole surfaces to excavate planting holes.

3.6.2 Planting and Backfilling

Where detailed in the Landscape Drawings, install weedmat in accordance with the manufacturer's recommendations as follows:

- (a) **Mass planting in mulched beds:** Install the weedmat before excavating plant holes. Finish all ends of the weedmat in neat lines secured with steel pins, and cut and remove all excess material.
- (b) **Individual planting:** After excavating the plant holes, place the weedmat of the size specified in Clause 2.6 around the base of each individually planted tree and shrub and secure the weedmat at the centre and each corner with steel pins.

At the bottom of each planting hole, incorporate a soil conditioner, at the rates recommended by the manufacturer, mixed with the topsoil backfill.

During planting and backfilling with site topsoil/general purpose topsoil/imported organic topsoil, place fertiliser tablets underneath the rootball of each plant. The number of tablets must be as specified in the Landscape Drawings.

HOLD POINT

Process Held:	Planting and backfilling of planting holes
Submission Details:	Give at least 2 days notice of the date and time at which planting holes will be ready for inspection
Release of Hold Point	The Principal may inspect excavated holes for soil conditioner and fertiliser tablets before releasing the Hold Point

Complete and lightly compact the backfilling of each hole by tamping down so that on completion the backfilled area is flush with the level of the surrounding soil.

3.6.3 Mulching

Where detailed in the Landscape Drawings, place woodchip mulch as follows:

- (a) **Mass planting in mulched beds:** Place mulch over the disturbed area but keep clear of the plant stem. Spread woodchip mulch to form a 100 mm thick layer over the area to be mulched.
- (b) **Individual planting:** Place woodchip mulch around the base of the plant as detailed in the Landscape Drawings.

Where detailed in the Landscape Drawings, install a tree guard around each plant.

3.6.4 Watering

Immediately after planting, water each plant in a manner which does not disturb the soil backfill and mulch.

The quantity of water required for each watering must be as specified in Table R179.5.

Table R179.5 – Quantity for Each Watering After Planting

Plant Size	Quantity
‘Forestry Tube’	5 litres
‘Semi Advanced’	10 litres
‘Advanced’	10 litres
‘Super Advanced’ – 25 L	30 litres
‘Semi Mature’ – 75 L	50 litres
‘Semi Mature’ – 100 L	50 litres

Undertake watering at two day intervals until completion of all landscape planting and commencement of Post-completion Maintenance Period (if applicable); after which further watering must be in accordance with Clause 4.3.

Where specified or shown on the Landscape Drawings, install a hardwood stake or a bamboo stake at 200 mm clear of each plant. Attach the plant to the stake by a Hessian tie as shown on the Landscape Drawings.

Mark the location of 'forestry tube' size trees using a bamboo marker stake. (This is not required where tree guards have been installed.)

3.7 TURFING FOR SPECIFIC LAWN AREAS

Place turf along medians and roadsides where shown on the Drawings or where directed by the Principal.

Cultivate areas to be turfed to a depth of 100 mm. Remove all extraneous material from the site.

Keep the turf moist at all times during transport and site storage and lay it in its final position as early as possible after delivery. Turf must be laid within 24 hours of delivery.

Place 50 mm of turf underlay over the area to be turfed and rake to provide an even surface.

Lay turf in a stretcher pattern with the joints staggered and close butted, and finish the joints flush after tamping the adjacent hard surfaces. Where practicable, lightly roll the turf to provide a level and even finish.

Water the turf immediately after laying until the underlay is moistened to its full depth. Continue watering every second day for the first fourteen (14) days, then at regular intervals until the turf is established. Turf must not be allowed to dry out during the establishment period.

Undertake further watering until Completion to maintain turf growth.

Turf will only be accepted when the feeder roots of the turf have infiltrated the turf underlay.

Turfing for slopes and open drain areas must be in accordance with RMS R178.

4 MAINTENANCE

4.1 REQUIREMENT AND DURATION

Maintain all landscape planting works in accordance with the requirements of Clause 4 during the period of construction and, where specified in Annexure R179/A, during the Post-completion Maintenance Period, until the Contractual Completion Date.

The duration of this Post-completion Maintenance Period is specified in Annexure R179/A. Failure to maintain the landscape planting in a healthy condition may result in the Principal arranging for the maintenance work to be carried out by others at your expense.

4.2 MAINTENANCE INSPECTIONS

4.2.1 Frequency

Carry out maintenance inspections of the plantings at intervals not exceeding one month.

4.2.2 Inspection Reports

Submit a written report to the Principal within four (4) days of each maintenance inspection.

The report must include the date of visit, maintenance works completed, maintenance works in progress and maintenance works required. The report must give details of damaged, dead or missing plants and show their locations on the relevant sheets of the Drawings.

The report must also identify separately any damage to landscape planting which has not been caused by you. Rectification work to any such damage will be in accordance with Clause 4.7.

4.3 WATERING

Watering prior to the commencement of the Post-completion Maintenance Period must be in accordance with Clause 3.6.4.

If Post-completion Maintenance Period is applicable, carry out maintenance watering at the following application rates:

- (i) 20 litres of water per plant at weekly intervals for the first 12 weeks;
- (ii) 10 litres of water per plant at fourteen (14) day intervals thereafter.

Notwithstanding the watering application rates specified above, ensure that a distinct level of moisture in the soil is maintained at all times during this Post-completion Maintenance Period and that plants do not dry out during this period.

The frequency of watering may be varied during periods of adequate rainfall with the approval of the Principal.

Notify the Principal in advance of each watering for verification of payment purposes.

4.4 WOODCHIP MULCH / WEEDMAT

Maintain woodchip mulch in a weed free condition and reinstate the woodchip mulch / weedmat as necessary.

The cost of woodchip mulch / weedmat maintenance during the Post-completion Maintenance Period must be included in Pay Item R179P10.

During each Maintenance Inspection, inspect all mulched areas and, where necessary, top up all areas to maintain the depth of woodchip mulch as specified in Clause 3.6.3.

4.5 WEED CONTROL

Keep all planting areas, and up to the limit of clearing as specified in Clause 3.5.2, free of grass and weed.

Carry out grass and weed removal at intervals of not more than four (4) weeks and ensure that weeds do not flower to form seed heads.

For those species listed by the relevant local government authority as noxious categories W1, W2, W3, or W4 under the Noxious Weeds Act 1993, take action as required by that local government authority. For all other species, spray with herbicide in accordance with the manufacturer's recommendations.

Do not spray where herbicide could fall into a watercourse or when wind conditions could cause drift outside the area to be treated or onto desirable plants.

After spraying, lop any dead weeds flush with the ground surface and dispose of the cuttings.

Remove by hand any weeds which cannot be controlled by herbicide. Ensure that the entire weed including all roots is removed. Dispose of the weeds off site.

4.6 DISEASE AND INSECT CONTROL

Plants must be sprayed with pesticides to control disease and insect infestation when and where directed by the Principal.

Spraying must only be undertaken on windless days (wind speeds of less than 10 km/hr). Inform the Principal, at least 24 hours before the intended time of spraying, of the following:

- (a) type of chemical to be used;
- (b) plant species to be treated;
- (c) extent of the infestation; and
- (d) timing of the proposed application.

Spraying must not be undertaken where there is a risk that pesticide could enter into a watercourse or when wind conditions could cause drift outside of the area to be treated.

4.7 PLANT REPLACEMENT

Replace at your own expense, any missing or dead plants, or plants nominated by the Principal as unsatisfactory, within fourteen (14) days of detection. Replacement plants must be of similar size and quality and of identical species and variety to the plant being replaced unless otherwise directed by the Principal. Plant all replacement plants in accordance with Clause 3.6 and reinstate any disturbed areas.

If the maintenance inspection report described in Clause 4.2 identifies damage which is not caused by you, carry out rectification work to the extent directed by the Principal. Plant replacement will be paid under Pay Item R179P14.1.

Other rectification work to repair such damage will be dealt with as a variation under the Contract.

4.8 STAKES AND TIES / TREE GUARDS

Repair any tree ties that have been broken and replace any missing stakes.

Maintain the tree guards around each plant so that the natural plant growth is not impeded or restricted. Replace damaged and missing tree guards as soon as practicable after being identified.

Remove tree guards progressively as plants mature and where it is deemed that the tree guard provides no further benefit to the establishment of the plant. By the end of Post-completion Maintenance Period, all tree guards must be removed and disposed of in a responsible manner.

4.9 PRUNING

Carry out all pruning in accordance with AS 4373.

4.10 MOWING AND EDGING

Mow and edge all turf areas and remove all grass clippings. Do not mow if there is litter, roadside rubbish and debris left on the turf as the litter may be transformed into confetti-like pieces after mowing.

Deal with the litter, roadside rubbish and debris in accordance with Clause 4.11.

Unless otherwise directed, the cut grass height must not be less than 35mm nor greater than 75mm. Do not remove more than 50% of the height of the uncut grass at any one time. The upper limit may be varied to account for terrain, species of grass and presence of debris.

Clippings may remain where they fall except for those that fall on road surfaces, line drains, footways or paved areas where they must be swept clear.

4.11 RUBBISH REMOVAL

Remove all rubbish and debris left by you within the area of landscape planting, and recycle or dispose of them in a responsible manner, and leave the site in a clean and tidy condition.

The Principal may direct you to remove rubbish left by others as a variation to the Contract.

ANNEXURE R179/A – DETAILS OF WORK

A1 POST-COMPLETION LANDSCAPE MAINTENANCE

Post-completion Landscape Maintenance required? Yes / No

Duration of Post-completion Maintenance Period: ___ months

A2 PRINCIPAL SUPPLIED PLANT MATERIALS

The plants listed below will be supplied by the Principal, to be collected from:

Name of Nursery: _____

Address: _____

Species	Number	Size

ANNEXURE R179/B – MEASUREMENT AND PAYMENT

Payment will be made for all activities associated with completing the work detailed in this Specification in accordance with the following Pay Items.

If any item for which a quantity of work is listed in the Schedule of Rates has not been priced by you, it will be deemed that due allowance has been made in the prices of other items for the cost of the activity which has not been priced.

Pay Item R179P1 - Preparation for Mulched Beds

The unit of measurement is the square metre of area prepared.

This item covers the preparation of mulched bed planting areas and includes clearing, mechanical weeding, cultivation and/or ripping (to various depths as detailed in the drawings), removal of extraneous material and levelling.

Pay Item R179P2 - Weed Control – Herbicide Application

The unit of measurement is the square metre of area sprayed.

The schedule rate includes the supply, preparation and application of herbicide and the disposal of used containers.

This pay item is only applicable to site preparation works and is not applicable during the Post-completion Maintenance Period.

Pay Item R179P3 - Imported Organic Topsoil

The unit of measurement is the square metre.

The schedule rate includes supply, transport and spreading of imported organic topsoil at the nominated depth.

Pay Item R179P4 - Woodchip Mulch

Pay Item R179P4.1 - Imported Woodchip Mulch

The unit of measurement is the square metre.

The schedule rate includes supply, transport and spreading of imported woodchip mulch. This item is applicable to mulch placement in mulched beds only.

Pay Item R179P4.2 - Site-won Woodchip Mulch

The unit of measurement is the square metre.

The schedule rate includes the transport and spreading of site mulch at the nominated depth of 100 mm.

Pay Item R179P5 - Weed Mat

The unit of measurement is the square metre of weedmat.

The schedule rate includes supply, transport, installing and securing of the weed mat for mulched beds.

Pay Item R179P6 - Trees and Shrubs

Pay Item R179P6.1 - Trees and Shrubs - Mass Planting

Pay Item R179P6.2 - Trees and Shrubs - Individual Planting

The unit of measurement is “each” plant.

Separate prices must be provided as follows:

- (a) Principal supplied plants
- (b) Contractor supplied plants

Separate rates must also be provided for each size and/or species of plant, as required.

The schedule rate includes supply and transportation of plant materials to site (or in the case of Principal supplied plant materials, their collection and transportation only), site preparation, excavation (in all types of material), planting, backfilling, fertilising, incorporating soil conditioner, installation of weedmat and tree guard, staking, mulching and watering as necessary until Completion and opening of the works, but excluding work during the Post-completion Maintenance Period.

Pay Item R179P7 - Edging

Pay Item R179P7.1 - Concrete Edging

The unit of measurement is the linear metre of concrete edging.

The schedule rate includes excavation, forming, concrete supply, pouring, joints, curing and backfilling.

Pay Item R179P7.2 - Timber Edging

The unit of measurement is the linear metre of timber edging, including fixing pegs.

The schedule rate includes excavation, supply and installation of timber edging and backfilling.

Pay Item R179P8 - Turf Underlay

The unit of measurement is the square metre of turf underlay (using topsoil material) installed at 50 mm thickness.

The schedule rate includes site preparation, supply, installation, and levelling of the soil.

Pay Item R179P9 - Turfing for Lawn Areas along Medians and Roadsides

The unit of measurement is the square metre of turf laid.

The schedule rate includes the supply, laying of turf, rolling and establishment watering.

(Note: Pay Items R179P10 to R179P17 are applicable to maintenance of landscape planting during the Post-completion Maintenance Period only.)

Pay Item R179P10 - Landscape Planting Maintenance

The unit of measurement is “month”.

The schedule rate includes all activities as specified in Clause 4 of this Specification during the Post-completion Maintenance Period, with the exception of those maintenance items allocated below (i.e. Pay Items R179P11 to R179P17 inclusive).

Pay Item R179P11 - Pruning and/or Removal of Dead Plants (Provisional)

The unit of measurement is “hour”.

The schedule rate includes labour, materials, equipment and removal from the site and disposal and/or recycling of mulching.

Pay Item R179P12 - Mowing (Provisional)

The unit of measurement is the square metre.

The schedule rate includes labour, materials, equipment, associated sweeping, litter removal, edging and trimming of grass to adjoining surfaces and objects.

Pay Item R179P13 - Woodchip Mulch Reinstatement (Provisional)

The unit of measurement is the square metre.

The schedule rate includes supply, transport and spreading of woodchip mulch reinstatement.

This Pay Item is only applicable when the need for reinstatement has been caused by one of the following causes below:

- (i) Flood
- (ii) Fire
- (iii) Vandalism
- (iv) Traffic incidents

Pay Item R179P14 - Replacement Works (Provisional)

These Pay Items are only applicable when the need for replacement has been caused by one of the following causes below:

- (i) Flood
- (ii) Fire
- (iii) Vandalism
- (iv) Traffic incidents
- (v) Fungal attack of a plants root system

Pay Item R179P14.1 - Plant Replacement (Provisional)

The unit of measurement is “each” plant.

Landscape Planting

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The schedule rate includes supply, excavation (in all types of material), planting, backfilling, fertilising, incorporating soil conditioner, installation of tree guard, staking, mulching and watering during the plant establishment period.

Separate rates are provided for each size of plant.

Pay Item R179P14.2 - Turf Replacement (Provisional)

The unit of measurement is the square metre.

The schedule rate includes supply, transport, ground preparation, installation of new turf and watering during the establishment period.

Pay Item R179P15 - Disease & Insect Control (Provisional)

The unit of measurement is “hour”.

This item includes labour, materials (incl. chemicals), equipment and disposal of surplus materials.

Pay Item R179P16 - Fertilising (Provisional)

The unit of measurement is “hour”.

The schedule rate includes labour, materials (incl. fertilisers/chemicals), equipment and disposal of surplus materials.

Pay Item R179P17 - Watering

Pay Item R179P17.1 - Watering – within first 12 weeks of Post-completion Maintenance Period

Pay Item R179P17.2 - Watering – after first 12 weeks of Post-completion Maintenance Period (Provisional)

The unit of measurement is “each” watering.

The schedule rate includes watering of all plant material including turf, as necessary to ensure that plants establish and do not dry out or die of dehydration during the Post-completion Maintenance Period (refer Clause 4.3).

ANNEXURE R179/C – SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS

Refer to Clause 1.2.3.

C1. SCHEDULE OF HOLD POINTS

Clause	Description
3.4	Advice that the setting out of all planting positions is complete
3.6.2	Advice that planting holes are ready for inspection

C2. SCHEDULE OF IDENTIFIED RECORDS

The records listed below are Identified Records for the purposes of RMS Q Annexure Q/E.

Clause	Description of the Identified Record
4.2	Maintenance Inspection Reports

ANNEXURES R179/D TO R179/L – (NOT USED)

ANNEXURE R179/M – REFERENCE DOCUMENTS

Refer to Clause 1.2.4.

RMS Specifications

RMS G10	Traffic Management
RMS G21	Occupational Health and Safety (Minor Works)
RMS G22	Occupational Health and Safety (Major Works)
RMS G34M	Environmental Protection – Maintenance Works (Management Plan)
RMS G35	Environmental Protection (Management Plan)
RMS G36	Environmental Protection (Management System)
RMS Q	Quality Management System
RMS R178	Vegetation

RMS Test Methods

RMS T123	pH Value of a Soil (Electrometric Method)
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Australian Standards

AS1289 D1.1	Soil chemical test – Determination of the organic matter content of a soil
AS 4419	Soil for landscaping and garden use
AS 4373	Pruning of amenity trees

NSW Government Publications

Noxious Weeds Act 1993
Occupational Health and Safety Act 2000
OHS Regulation 2001
Code of Practice for the Safe Use and Storage of Chemicals (including Pesticides and Chemicals) in Agriculture 2006