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Technical Specification

**Transport and Main Roads Specifications
MRTS16E Establishment and Monitoring Works**

April 2012

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1 Introduction

This technical specification applies to the general requirements of establishment and monitoring works for road landscape and revegetation and associated works.

This technical specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other technical specifications as appropriate.

This technical specification forms part of the Transport and Main Roads Specifications Manual.

2 Definition of terms

The terms used in this specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications*. Landscape and revegetation related terms and abbreviations used in this specification are defined in Table 2 of MRTS16 *General Requirements – Landscape and Revegetation Works*. Guidance on generic landscape and revegetation terms is contained in the department's *Landscape and Revegetation Works User Guidelines*.

3 Standards

3.1 Materials and practices

Materials and practices shall be in accordance with, but not limited to, the Australian Standards AS 4373 *Pruning of Amenity Trees*.

Application of herbicides shall only be carried by a licensed contractor in accordance with the *Agricultural Chemicals Distribution Control Act (1966)*.

4 Quality system requirements

4.1 Hold Points, Witness Points and Milestones

General requirements for Hold Points, Witness Points and Milestones are specified in Clause 5.2 of MRTS01 *Introduction to Technical Specifications*.

The Hold Points, Witness Points and Milestones applicable to this specification are summarised in Table 4.1.

Table 4.1 – Hold Points, Witness Points and Milestones

Clause	Hold Point	Witness Point	Milestone
5.1			Submission of samples
6.1	1. Submission of Pest and Disease Control Proposal (P&DCP)		
6.3.1	2. Submission of herbicide distribution permit		
10			Commencement of Landscape and Revegetation Works Establishment Period
10			Commencement of Landscape and Revegetation Works Monitoring Period

Clause	Hold Point	Witness Point	Milestone
10			Finalisation of Landscape and Revegetation Works Monitoring Period
10.1.1		Watering	
10.1.2		Watering	
10.1.2		Fertilising and Pre-emergent	

5 General requirements

5.1 Samples

The Contractor shall submit to the Administrator, samples of materials in accordance with Clause 5.5 of MRTS16 *General Requirements – Landscape and Revegetation Work*. **Milestone**

6 Weed, pest and disease control

6.1 General

During the establishment and monitoring periods all landscape and revegetation treatments shall be maintained in a weed free condition.

All declared plants shall be managed to the level of control required by the *Land Protection (Pest and Stock Route Management) Act 2002* and the *Land Protection (Pest and Stock Route Management) Regulation 2003*.

During the establishment and monitoring periods all landscape and revegetation treatments maintained in a pest and disease free condition.

Where the installed landscape and revegetation treatments become affected with pests or diseases which have the potential to cause lasting damage and prevent the landscape and revegetation works complying with the acceptance criteria specified in Clause 11, the Contractor shall submit a P&DCP to the Administrator for a determination as to its suitability. **Hold Point 1**

The Contractor shall possess qualifications and licences relevant to the products being applied.

6.2 Material requirements

Refer to Clause 5.3 of MRTS16 *General Requirements* for herbicide, insecticide and fungicide material requirements.

6.2.1 Pest and disease control proposal

The Contractor shall prepare and submit a P&DCP that includes the following:

- a) identified pest and / or disease infestation
- b) extent and nature of the affected area, and
- c) proposed method of management.

Pests and diseases shall be controlled in accordance with the P&DCP.

6.3 Construction

6.3.1 Weed control

The Contractor shall handle and apply herbicides, in accordance with the manufacturer's instructions.

Application of herbicides shall only be carried out by a licensed contractor in accordance with the *Agricultural Chemicals Distribution Control Act (1966)*.

Where herbicide is required to be applied to hazardous areas, as defined by the *Agricultural Chemicals Distribution Control Act (1966)*, the Contractor shall obtain and submit a distribution permit to the Administrator prior to carrying out the works. **Hold Point 2**

Herbicides shall be applied in accordance with the manufacturers' instructions or permit instructions under the *Chemical Usage (Agricultural and Veterinary) Control Act (1988)*.

Over-spray onto landscape and revegetation or existing turf, grasses and plants to be retained shall be minimised. Where landscape and revegetation treatments or existing turf, grasses and plants to be retained are poisoned due to overspray, they shall be replaced by the Contractor in accordance with the MRTS16 specification suite, with plants of the same species, size and quality.

Where herbicides are prohibited from use, weeds shall be removed by hand or mechanical means.

6.3.2 Pest and disease control

Application of pesticides and fungicides shall only be carried by a licensed contractor in accordance with the manufacturers' instructions and the *Agricultural Chemicals Distribution Control Act (1966)*.

7 Mowing, slashing and brushcutting

7.1 General

Mowing, slashing and brushcutting operations of grass and turf treatments installed under the Contract, and the management of cover crops in seeding treatments, shall be undertaken as part of the establishment and monitoring work operations.

7.2 Construction

The Contractor shall mow, slash and brushcut landscape and revegetation treatments installed under the Contract to the heights as specified in Item 3 of the Annexure, or where not specified, as shown in Table 7.2.

Cover crops, in native seeded areas shall be slashed or brushcut, without damage to native seedlings in accordance with Table 7.2.

Cut vegetation shall be evenly windrowed or dispersed over the area.

Table 7.2 – Mowing, slashing and brushcutting schedule for new landscape and revegetation treatments

Landscape and Revegetation Treatment (as shown in the Drawings)	Mow	Average Height Prior to Mowing (mm)	Average Height After Mowing (mm)
High profile grass seeded areas adjoining turf areas	1 st	200	50
	2 nd	75	30
	3 rd and consecutive	50	30

Landscape and Revegetation Treatment (as shown in the Drawings)	Mow	Average Height Prior to Mowing (mm)	Average Height After Mowing (mm)
Turfed areas in pedestrian environments or other high profile areas	1 st	50	30
	2 nd	50	30
	3 rd and consecutive	50	30
Landscape and Revegetation Treatment (as shown in the Drawings)	Slash or Brushcut	Average Height Prior to Slashing / Brushcutting (mm)	Average Height after Slashing / Brushcutting (mm)
Turfed areas in table drains and other low profile areas	1 st	150	100
	2 nd	200	100
	3 rd and consecutive	300	75
Low profile grass seeded areas	1 st	150	100
	2 nd	200	100
	3 rd and consecutive	300	75
Cover crops in native seeded areas (other than native grass species)	1 st	300	150
	2 nd	300	200 Only without damage to native seedlings

8 Pruning

8.1 General

The Contractor shall prune plants, including tip pruning, as necessary to promote vigorous and dense new growth.

Pruning may also be used to remove damaged, diseased or pest infested parts of plants.

The Contractor shall formatively prune trees to maintain sight visibility and general tree form of advanced stock or existing vegetation.

8.2 Construction

Pruning shall be in accordance with AS 4373 *Pruning of Amenity Trees*.

Care shall be taken to avoid placement of prunings in a manner that may be hazardous to public safety. Placement of prunings in clear zones, sight visibility zones and pedestrian areas is prohibited.

Any pest or disease infested prunings shall be disposed off site as per Clause 11.3 of MRTS04 *General Earthworks*.

9 Watering

9.1 General

Refer to Clause 5.2 of MRTS16 *General Requirements*.

9.2 Construction

Watering shall be conducted in a manner that does not cause damage to installed landscape and revegetation treatments and in accordance with Clause 10.1.1 and 10.2.1.

10 Establishment and monitoring – general

Establishment and monitoring operations shall be carried out following the installation of landscape and revegetation treatments.

Establishment and monitoring consists of two distinct periods:

- a) the Landscape and Revegetation Works Establishment Period, and
- b) the Landscape and Revegetation Works Monitoring Period.

The Landscape and Revegetation Works Establishment Period operations shall be undertaken by the Contractor immediately following the installation of landscape and revegetation treatments. The Certificate of Commencement of Landscape and Revegetation Works Establishment Period shall be issued when it is deemed that the installation of works is compliant. **Milestone**

The Landscape and Revegetation Works Monitoring Period is the period which commences with the issuing of the Certificate of Commencement of the Landscape and Revegetation Works Monitoring Period. The Certificate of Commencement of the Landscape and Revegetation Works Monitoring Period shall be issued after the completion of the Landscape and Revegetation Works Establishment Period and where landscape and revegetation treatments have met the Acceptance Criteria as per Clause 11. **Milestone**

The Certificate of Finalisation of the Landscape and Revegetation Works Monitoring Period shall be issued at the completion of the Landscape and Revegetation Works Monitoring Period and where landscape and revegetation treatments have met the Acceptance Criteria as per Clause 11.

Milestone

For the duration of the establishment and monitoring periods, a Landscape and Revegetation Works Monthly Program and Inspection Report shall be submitted to the Administrator, within seven days of the monthly inspection being undertaken.

The Contractor shall arrange with the Administrator a suitable timetable for joint monthly inspections.

During the establishment and monitoring periods, failed treatments and container stock shall be re-installed with the same species and container size as originally specified, unless otherwise proven unsuitable and reported as such in the monthly report, with a substitute species, for determination as to its suitability by the Administrator, within seven days of the failure being identified.

Depending on the nature of the failure it may also be necessary to undertake additional soil amelioration, ground preparation and / or installation of planting media.

10.1 Landscape and revegetation works establishment period

The Landscape and Revegetation Works Establishment Period shall be a minimum duration of three months from the date of the Certificate of Commencement of Landscape and Revegetation Works Establishment Period.

Where the Contractor has installed works in a series of lots, the Contractor shall continue to establish all lots until the Contractor has carried out establishment operations on the final lot for a minimum three month duration.

Notwithstanding the above requirements the Landscape and Revegetation Works Establishment Period shall continue until all packages and stages meet the Acceptance Criteria as per Clause 11. All packages or stages are assessed when the final package or stage has completed the minimum three month duration.

10.1.1 Landscape and revegetation works establishment period operations

The Contractor shall care for installed landscape and revegetation treatments to ensure their establishment and to meet the Acceptance Criteria of Clause 11.

The Contractor shall keep the site weed, pest and disease free.

The Contractor shall advise the Administrator 24 hours prior of each watering for verification and payment purposes. **Witness Point**. The Contractor shall water vegetative treatments as follows:

- a) seeded areas – sufficient to moisten the full planting media layer and a minimum 100 mm depth of the underlying subsoil layer
- b) turf areas - sufficient to moisten the full planting media layer and a minimum 100 mm depth of the underlying subsoil layer, and
- c) container stock – 20L of water per container per week for the first eight weeks and 10L of water per container for the remainder of the Establishment Period.

Notwithstanding the above requirements for watering, it is the Contractors responsibility to ensure that moisture is maintained in the planting media and underlying subsoil throughout the first three months after the installation of landscape and revegetation treatments.

The Contractor may submit to the Administrator a request to vary the watering intervals during periods of sufficient rainfall for determination as to its suitability, prior to varying watering intervals.

10.2 Landscape and revegetation works monitoring period

The Landscape and Revegetation Works Monitoring Period shall be for a duration of 12 months from the date of the Certificate of Commencement of the Landscape and Revegetation Works Monitoring Period and may be undertaken by either the Contractor or the Principal depending on the contractual arrangements.

Unless noted in the Contract, the Contractor shall undertake the Landscape and Revegetation Works Monitoring Period.

10.2.1 Landscape and revegetation works monitoring period operations

The Contractor shall care for installed landscape and revegetation treatments to ensure the long term sustainability of landscape and revegetation treatments and to meet the acceptance criteria of Clause 11.

The Contractor shall keep the site weed, pest and disease free.

The Contractor shall reapply controlled released fertiliser at the specified rates applied at the time of plant material installation, prior to end of the monitoring period.

The Contractor shall top up organic mulch to the originally specified depths and re-apply pre-emergent.

The Contractor shall advise the Administrator 24 hours prior to each watering for verification and payment purposes. **Witness Point** Vegetation treatments shall be watered to maintain plant health, to minimise plant loss and to ensure acceptance criteria is met.

The Contractor shall submit a request in writing to the Administrator for additional watering above the monthly allowance, where extreme weather conditions have the potential to cause severe stress to the landscape and revegetation treatments.

The Contractor shall, one month before the completion of the Landscape and Revegetation Works Monitoring Period:

- a) apply controlled release fertiliser to all treatments as per MRTS16B *Vegetation Ground Works*
- b) top up mulch, and
- c) apply pre-emergent herbicide to all mulched container stock areas and activate as per Clause 8 of MRTS16B *Vegetation Ground Works*. **Witness Point**

10.3 Landscape and revegetation works monthly program and inspection report

The Contractor shall submit a report to the Administrator each month, within seven days of the inspection, including:

- a) monthly program of maintenance works
- b) dates of maintenance visits and inspections
- c) maintenance works undertaken
- d) maintenance works in progress
- e) watering application dates and volumes used per application
- f) dead or failing vegetation and their general locations on marked up landscape and revegetation plans
- g) replacement works undertaken
- h) issues identified during inspections and actions required to remedy these, and
- i) damage to vegetation caused by vandalism or theft of vegetation.

The Contractor shall provide a detailed list and costing of all works undertaken, materials used and expenses incurred in undertaking the establishment and monitoring activities.

All vandalism and theft claims shall be supported by photographic evidence and/or police report.

10.4 Selective removal of non-complying vegetation

During the establishment and monitoring periods, potentially non-complying vegetation shall be removed in areas including:

- a) vegetation setbacks
- b) under overhead services or structures
- c) sight visibility zones

- d) clear zones, and
- e) service easements.

11 Acceptance criteria

11.1 Landscape and revegetation works establishment and monitoring period acceptance criteria

Landscape and revegetation establishment and monitoring operations shall be assessed on the requirements in Tables 11.1.1, 11.1.2 and 11.1.3 relevant to the type of landscape and revegetation treatment and in accordance with Clause 10.

Where areas do not comply with the above, the non-conformance shall be recorded by the Administrator. The Contractor shall, depending on the non-conformance:

- a) reapply the landscape and revegetation treatment to the area as specified
- b) manage weed, pest or disease
- c) fertilise
- d) top up mulch and re-apply pre-emergent, and/or
- e) remove potentially non-complying vegetation.

11.1.1 Seeded areas

The Contractor shall achieve vegetation cover specified in accordance with Table 11.1.1.

Table 11.1.1 – Seeded areas acceptance criteria

End of the Landscape and Revegetation Works Establishment Period
<ul style="list-style-type: none"> • No rill or sheet erosion or bare areas greater than 0.5 m² • 80% ground surface protection with combination of cover crop and perennial grasses • Cover crops and perennial grass heights have been managed as per Table 7.2
End of the Landscape and Revegetation Works Monitoring Period
<ul style="list-style-type: none"> • No rill or sheet erosion • 90% ground surface protection with perennial grasses only • Perennial grass heights have been managed as per Table 7.2

11.1.2 Turf areas

The Contractor shall achieve cover specified in accordance with Table 11.1.2.

Table 11.1.2 – Turfed areas acceptance criteria

End of the Landscape and Revegetation Works Establishment Period
<ul style="list-style-type: none"> • 100% ground surface protection • No bare areas • Turf heights have been managed as per Table 7.2
End of Landscape and Revegetation Works Monitoring Period
<ul style="list-style-type: none"> • 100% ground surface protection • No bare areas • Turf heights have been managed as per Table 7.2

11.1.3 Container and ex-ground stock areas

Container stock shall:

- a) be established and well formed and show evidence of growth typical of the species and seasonal conditions
- b) have healthy root systems that have penetrated into the surrounding, undisturbed ground so that the plant cannot be easily lifted out of its planting hole, and
- c) meet the requirements of Table 11.1.3.

Table 11.1.3 – Container and ex-ground stock acceptance criteria

End of the Landscape and Revegetation Works Establishment Period		
Container Size	Maximum Acceptable Plant Failure (Failed plants ÷ total plants x 100 = x %)	Maximum Acceptable Concentration of Failure (% of any given area)
Tube Stock to 140mm	1%	2%
200mm to 300mm	0%	0%
45L or larger	0%	0%
Acceptance Criteria at the End of the Landscape and Revegetation Works Monitoring Period		
Container Size	Maximum Acceptable Plant Failure (Failed plants ÷ total plants x 100 = x %)	Maximum Acceptable Concentration of Failure (% of any given area)
Tube Stock to 140mm	5%	5%
200mm to 300mm	1%	2%
45L or larger	0%	0%

12 Supplementary requirements

The requirements of MRTS16E *Establishing and Monitoring Works* are varied by the supplementary requirements given in Item 4 of Annexure MRTS16E.1 *Establishing and Monitoring Work*.

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