

# PART D

## Chapter 1 Construction and Operations

June 2013

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# Chapter 1 Amendments – June 2013

## Revision Register

Issue / Revision No	Reference Section	Description of Revision	Authorised by	Date
1	-	Initial Release of 2nd Edition of Manual	Steering Committee	Jun 2013

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	<b>OPERATIONAL PHASE</b>	MAINTENANCE	<p><b>LANDSCAPE AND URBAN DESIGN</b></p> <p>Routine Maintenance</p> <ul style="list-style-type: none"> <li>Road Maintenance Performance Contract</li> <li>Vegetation Management</li> </ul> <p>Asset Management</p> <ul style="list-style-type: none"> <li>Management of the Urban Forest</li> <li>Renewal and re-living</li> </ul>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Table D1-1: Landscape and urban design processes in the implementation and operational phases.

## 1.2 Implementation

### 1.2.1 Sequencing / Coordination

The Contractor engaged to implement landscape and urban design works should construct, establish and maintain the works to the standard required by the contract documents. The Contract Manager ensures that these requirements are met by the Contractor and all installations are compliant. The Principal may undertake compliance reviews and monitoring on a regular basis throughout the contract period (Figure D1-1).



**Figure D1-1: Site inspections are critical to review and monitor compliancy of construction works**

An understanding of the relationship between documents of a contract package is essential to contract administration. The order of precedence of documents within departmental Road Construction Contract are (documents higher in the list have a higher priority):

- Formal Instrument of Agreement;
- Letter of Acceptance;
- Notice to Tenderers;
- Any Special Conditions of Contract;
- Supplementary Conditions of Contract;
- General Conditions of Contract;
- Drawings;
- Standard Drawings Roads;
- Project-Specific Supplementary Specifications;
- Standard Specifications Roads;
- Manual of Uniform Traffic Control Devices;
- Conditions of Tendering;
- Completed Tender Form and Tender schedules modified as necessary by post tender correspondence; and
- Other Contract Documents.

A thorough working knowledge of the following documents is essential to administering the landscape works for complying results:

- MRS16 /MRTS16A-E Landscape and Revegetation Works, Appendices and Annexures;
- MRS16 /MRTS16A-E Landscape and Revegetation Works User Guidelines;
- MRS16/MRTS16 Landscape and Revegetation Works: Contract Administration Systems Manual; and
- Soil Management Manual.

These documents are available on the Departments website [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au). These documents are updated periodically with project learning's.

## 1.2.2 MRS16 and MRTS16A-E Landscape and Revegetation Works

This specification must be read in conjunction with other technical specifications referenced within the contract documents. The specification provides hold points, witness points and milestones to ensure quality assurance requirements are achieved. The Table D1-2 summarises some of these key elements, refer to specification Clause 4 of each part for a complete list.

Part	Hold Point	Witness Point	Milestone
MRTS16B	Submission of a Planting Media Management Plan (PMMP-C)		
MRTS16B			Submission of samples
MRTS16B		Application of amelioration agents to in situ material – subsoil	
MRTS16B		Application of amelioration agents to in situ material – planting media insitu	
MRTS16C	Submission of seed supply proposal (SSP)		
MRTS16C	Preparation of area to be seeded		
MRTS16C	Seed added to seeding mix		
MRTS16C	Submission of plant supply proposal (PSP)		
MRTS16C		Joint plant nursery inspections	
MRTS16C		Delivery of plants	
MRTS16C	Preparation of area to be planted with container stock		
MRTS16C	Set-out of plants		
MRTS16E	Submission of Pest and Disease Control Proposal (P&DCP)		
MRTS16E	Submission of herbicide distribution permit		
MRTS16E			Commencement of Landscape and Revegetation Works Establishment Period
MRTS16E			Commencement of Landscape and Revegetation Works Monitoring Period
MRTS16E			Finalisation of Landscape and Revegetation Works Monitoring Period

Table D1-2: Hold points, Witness Points and Milestones



### **1.2.3 Planting Media Management Plan - Construction (PMMP-C)**

A mandatory requirement of MRTS16B Vegetation Ground Works is the development of a PMMP-C by the Contractor. The focus of a PMMP-C is to ensure that site soils are compliant with the Department's standards and suitable for reuse as planting media. A testing procedure according to MRTS16B promotes compliance.

### **1.2.4 Request For Information**

Request for information are generated by the Contractor seeking clarification on an issue related to the contract documents. It may relate to an interpretation of a detail, specification or notation on the drawings that is needed to continue work.

The Contract Manager may seek advice from the Principal or Principal's technical specialist to clarify the issue(s) or resolve any conflict. The response may generate a variation and further approval is required. If no cost is involved, works may proceed.

### **1.2.5 Non-Conformance Reports**

A non-conformance report is raised by the Contract Manager where non-compliances to the standards and details of the contract documents are determined. It requires the Contractor to rectify the works to meet the acceptance criteria or tolerances specified. All non-conformance reports must be closed out prior to commencing the maintenance establishment period.

### **1.2.6 Contract Administration Checklists**

The MRTS16 Landscape and Revegetation Works Contract Administration Checklists are part of the departments *Contract Administration System Manual*. The manual provides guidance, tools and techniques for the Contract Manager. The checklists are one tool set up to parallel how the specifications are written and pose questions regarding actions required by the Contractor.

#### **16.2.6.1 Establishment period**

The establishment period operations are undertaken by the Contractor immediately following the installation landscape treatments. A *Certificate of Commencement of Landscape and Revegetation Works Establishment Period* is issued when it is deemed that the installation of works is compliant. The operations during the establishment period include weed and pest control, mowing, slashing and brushcutting, watering, replacement of failed vegetation, topping up of mulch, and pruning/ shaping of vegetation. Monthly inspections are required during this period to review the Contractor's program and works completed. The establishment period is finalised when the designated period (minimum 3 months) is completed and where works have met the acceptance criteria of the contract. At the finalisation of the establishment period a certificate commencing the monitoring period is issued.

#### **16.2.6.2 Monitoring Period**

The monitoring period operations are undertaken immediately following the completion of the establishment period. A *Certificate of Commencement of the Landscape and Revegetation Works Monitoring Period* is issued after the finalisation of the establishment period. The operations during the monitoring period include weed and pest control, mowing, slashing and brushcutting, watering, replacement of failed vegetation, topping up of mulch, and pruning/ shaping of vegetation. Monthly inspections are required during this period to review the Contractor's program and works completed. The monitoring period is finalised when the designated period (typically 12 months or to end of Defects Liability Period) is completed and where works have met the acceptance criteria of the contract. At the finalisation of the monitoring period a certificate completing the monitoring period is

issued.

### **16.2.6.3 Final Inspection**

The *Certificate of Finalisation of the Landscape and Revegetation Works Monitoring Period* is issued after the finalisation of the monitoring period.

## **1.3 Finalisation**

### **1.3.1 Hand-over to the Region or Local Government Authority**

Once the final inspection has been completed and all issues are closed out the project is handed over to the asset owner to maintain and operate. The process involved includes:

- assigning the parties responsible for maintenance, the Department or Local Government Authority or Queensland Rail; and
- delineating extents of responsibility on plans.

This process of agreement is best undertaken throughout the design process to ensure expectations are met. Most projects involving landscape works are covered by this process, only projects undertaken under Element 8 - Road Landscape may require project specific application of this process.

### **1.3.2 As Constructed Drawings**

As constructed drawings are required to support the asset management systems, designers need ensure that they:

- represent surveyed as constructed landscape revegetation and urban design treatments;
- are based on As-Constructed X-reference drawings obtained from the other design disciplines;
- include photographic records (Figure D1-2) of the landscape revegetation and urban design treatments, demonstrating finished quality; and
- are used to form the basis for the Project's *Landscape Operational Manual*.



Figure D1-2: Photographic records reflect the standard of installed treatments.

### 1.3.3 Project Learning's

For most Type 1 projects, a project learning's paper should be written to capture strengths and weaknesses associated with the project. It should be a broad review of the consultation and contract administration process as well as review the technical improvements or areas for further research and development.

## 1.4 Operations

### 1.4.1 Routine Maintenance

Routine maintenance is essential to maintain a safe road corridor. The most frequent and highest cost maintenance activities are the removal of hazards within clear zone and maintaining site distance requirements. While grass is relatively inexpensive to establish through seeding large areas, it is easily invaded by tall colonizing weeds and exotic grasses. This can create conflicts with sight visibility requirements and potential fire hazards, and require considerable reoccurring management. Slashing is the highest cost routine maintenance activity on a state wide basis.

The landscape and urban design process should develop alternative sustainable landscape treatments that improve environmental, safety and economic values for the life of the asset. The preferred outcome should have reduced the maintenance requirements down to the bare essentials. This includes:

- a progressive reduction in the number of interventions over time for planted areas;
- eliminating need for herbicide applications and brush cutting around road furniture such as guardrail posts;
- eliminating turf grass in urban medians; and
- screening noise barriers where space permits to reduce/eliminate graffiti.

Routine maintenance of landscaped areas should be limited to target herbicide spraying and annual pre-emergent herbicide renewal application in mulched areas, topping up of mulch at year five, vegetation management in relation to clear zone requirements and the landscape design should

support these limited operations under the *Road Maintenance Performance Contract*.

Maintenance activities pose a unique set of challenges for the personnel undertaking the tasks, particularly where located close to or adjacent to the roadway. Workplace, Health and Safety require that safety precautions and work method statements are in place prior to any activity occurring within the corridor (Figure D1-3). This is to ensure the workers safety and that of the travelling public.



Figure D1-3: Effective traffic control in place to ensure safety of personnel maintaining road landscape

Creating a safe work environment for maintenance crews to operate has a significant impact on budgets. Traffic control and lane closures are significant costs associated with the maintenance of the road landscape. These safety measures can restrict the hours the site is available due to peak hour traffic. Some work activities may only be able to occur at night due to traffic volumes during the daylight hours. In many cases, the cost of traffic control is equal to or more than the cost of the maintenance activity. Bundling routine landscape maintenance with other road safety maintenance is a means to reduce costs, however requires proper planning and co-ordination.

The *Road Maintenance Performance Contract* is the method by which the Department delivers routine maintenance.

### 1.4.2 Road Maintenance Performance Contract

The *Road Maintenance Performance Contract Manual* has three parts:

- Volume 1 Sole Invitee - outlines the contractual conditions of a sole invitee contract.
- Volume 2 Open Competition - outlines the contractual conditions of an open tender process.
- Volume 3 Activity Standards and Specifications - defines the activities and the work required under that activity.

This manual is available on the department's website [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)

### 1.4.3 Element 8 - Road Landscape

Current maintenance practices are reactive. With the adoption of the Road System Manager (RSM) Framework and Maintenance Performance and Operations (MP&O) Programs there will be a transition period to alternative approaches that ensure that the Road Landscape Frameworks (RLF) levels of service are achieved. This may take a number of years as a cultural change is required in developing and adopting new systems to support these outcomes.

The Element 8 - Road Landscape, Element Management Plan, relies on the key principles, strategic

objectives, standards and practices of this manual. The plan focuses on landscape and urban design improvements to promote compliance with the level of service on all Queensland roads. This includes:

- Streetscapes and Town Entries: improvements to State-wide tourism opportunities through the upgrade of regional and town 'main street' streetscapes and 'town entry' statements delivered in partnership with the local government authority.
- Urban Forest: creation of opportunities for amenity, air and water quality improvements through the implementation of revegetation of grassland within roundabouts, interchanges and junctions of major and arterial roads to minimise ongoing maintenance.
- Tourism: improvements to road user experience of the scenic and aesthetic amenity of the State-wide road corridor through Themed Tourism route signage, interpretive signage and amenity plantings at primary links to tourism hubs, lookouts, rest areas and/or points of historical/cultural interest.
- Urban Integration: installation of screen planting to front of noise barriers where space is available (>1.5m width) or painting where planting is not feasible (min. barrier longevity 10yrs+).

#### 1.4.4 Management of the Urban Forest

The urban forest is a collective resource; which provides the community with a wide range of safety, social, economic, visual and environmental benefits. Management requires recognition of the role of the urban forest as an essential infrastructure asset. Achieving and maintaining an urban forest is a key outcome the road landscape frameworks levels of service in an urban context.

It involves increasing the extent and quality of the urban forest through coordinated planning, suitable planting and ongoing maintenance practices (Figure D1-4). The urban forest may be impacted by future road upgrades. Where the road upgrade is 10-15 years in the future, an ephemeral, short lived landscape based on Acacia species is preferred. Where a longer period prior to upgrading is probable, then a planting design based upon long lived species is preferred.



Figure D1-4: Management of the existing urban forest and implementing urban forest concepts within the corridor

#### **16.4.4.1 Vegetation Management**

Vegetation within the road corridor should be managed utilising the following standards:

- *Australian Standard AS4970-2009: Protection of trees on development sites*- for where maintenance works includes minor construction works;
- *Australian Standard AS4373-2007: Pruning of Amenity Trees* - for best practice pruning techniques;
- *Australian Standard AS4454-2012 Composts, soil conditioners and mulches*; and
- Thayer Tree Valuation Method: for calculating replacement value of trees.

#### **16.4.4.2 Vegetation Management and Maintenance Team Model**

To promote vegetation management and ensure maintenance activities are executed to these standards: the team should consist of personnel with:

- A Certificate III in Horticulture;
- An Agricultural Chemicals Distribution Control ground distribution operators license;
- Road Landscape Manual Awareness Training;
- MRTS16 Landscape and Revegetation Works Training;
- Soil Management Manual Training; and
- Manual of Uniform Traffic Control Devices Training.