Main Roads
Technical Standard

MRTS16D

Hardscape Works

June 09

Queensland Government

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Hardscape Works

1 INTRODUCTION

This Technical Standard applies to the general requirements of hardscape works for road construction and associated works.

This Technical Standard shall be read in conjunction with MRTS01 *Introduction to Technical Standards*, MRTS50 *Specific Quality System Requirements* and other Technical Standards as appropriate.

This Technical Standard forms part of the Main Roads Specifications and Technical Standards Manual.

2 DEFINITION OF TERMS AND ABBREVIATIONS

The terms used in this Standard shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Standards*. Landscape and revegetation related terms and abbreviations used in this Standard are defined in Table 2 of MRTS16 *General Requirements – Landscape and Revegetation Works*. Guidance on generic Landscape and Revegetation terms is contained in MRTS16 *User Guidelines Vegetation Ground Works*.

3 STANDARDS

3.1 Materials and Practices

Materials and practices shall be in accordance with, but not limited to, the following Australian Standards –

a) AS 1477 UPVC pipes and fittings for pressure applications;

b) AS 1604 Specification for preservative treatment;

c) AS 2032 Code of practice for installation of UPVC pipe systems;

d) AS 2033 Installation of polyethylene pipe systems;

e) AS 2053 Conduits and fittings for electrical installations – General requirements;

f) AS 2698 Plastics pipes and fittings for irrigation and rural applications – Polyethylene micro-irrigation pipe;

g) AS 2845 Water supply – backflow prevention devices – Materials, design and performance requirements;

h) AS 3000 Electrical installations;

i) AS 3500 National Plumbing and Drainage Code for water supply connections;

j) AS 4129 Fittings for polyethylene (PE) pipes for pressure applications; and

k) AS 4130 Polyethylene (PE) pipes for pressure applications.

Materials used for electrical cabling and fittings shall comply with the requirements of MRTS95 *Switchboards and Cables*.

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 Standards*.

The Hold Points, Witness Points and Milestones applicable to this Standard 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
7.3.3	1 Submission of irrigation design		
7.5	2 Commissioning of the irrigation system		

5 GENERAL REQUIREMENTS

5.1 Samples

The Contractor shall submit to the Administrator, samples of materials as specified in Clause 2.1 of Annexure MRTS16D.1 or where not specified as listed in Clause 5.4 of MRTS16 *General Requirements*. Milestone

6 PLANTING BED EDGING

6.1 General

Planting bed edging operations shall be carried out where shown on the Drawings, or as specified elsewhere in the Contract.

6.2 Material Requirements

6.2.1 Timber Planting Bed Edges

Timber shall be softwood that is preservative treated in accordance with AS 1604.1 – Hazard Class 5. Fixings shall be hot dipped galvanised. Stakes and braces shall be hardwood.

Timber edging type shall be as shown on the Drawings and have dimensions as specified in Table 6.2.1.

Table 6.2.1 – Timber Garden Edging

Edging Type	Size (mm)	Ancillary Component	Size (mm)
1	3000 x 100 x 15	Bracing	600 x 75 x 15
2	3000 x 150 x 38	Stakes	450 x 50 x 38
3	3000 x 250 x 75	-	-

6.2.2 Concrete Planting Bed Edges

Concrete planting bed edging shall consist of Class 20 MPa/20 concrete in accordance with the requirements of MRTS03 *Drainage, Retaining Structures and Protective Treatments*.

6.2.3 Unit Paver Planting Bed Edges

Unit paver planting bed edging shall consist of paving blocks constructed of the material and of the colour shown on the Drawings. Cement mortar shall be in accordance with the requirements of MRTS03.

Concrete strip footings shall be Class 20 MPa/20 in accordance with the requirements of MRTS03 *Drainage, Retaining Structures and Protective Treatments*.

Compaction of subgrade shall be in accordance with the requirements of MRTS04.

6.2.4 Rock Boulder Planting Bed Edges

Rock boulder planting bed edging shall consist of rock boulders, free of mud and of the type and sizes shown on the Drawings.

6.3 Construction

6.3.1 General

Planting bed edging shall be installed in the locations and to the details shown on the Drawings.

6.3.2 Timber Planting Bed Edging

Timber planting bed edging shall be installed in accordance with Standard Drawing 1659.

6.3.3 Concrete Planting Bed Edging

Concrete planting bed edging shall be constructed in accordance with the requirements of MRTS03 *Drainage, Retaining Structures and Protective Treatments* and Standard Drawing 1660.

6.3.4 Installation of Unit Paver Planting Bed Edging

Unit paver planting bed edging shall be installed in accordance with Standard Drawing 1660.

6.3.5 Installation of Rock Boulder Planting Bed Edging

Rock boulder planting bed edging shall be installed in accordance with Standard Drawing 1660.

7 IRRIGATION SYSTEM

7.1 General

Irrigation systems shall be installed where shown on the Drawings or as stated elsewhere in the Contract.

7.2 Material Requirements

The materials to be used in the irrigation system shall comply with the relevant Australian Standard or Technical Standard.

7.3 Design of the Irrigation System

7.3.1 General

The intent of the design for the irrigation system shall be to provide a functioning sprinkler and / or drip irrigation system that shall deliver the quantity of water to maintain plant available water (PAW) without wastage.

7.3.2 Scope

The extent of the irrigation system shall be as shown in the Drawings or as stated in Clause 3.1 of Annexure MRTS16D.1.

7.3.3 Design

The design of the irrigation system shall be carried out by a suitably qualified, certified irrigation designer.

The water supply components shall be designed by a civil engineer with experience in municipal water supply installations.

The 240V electrical components shall be designed by an electrical engineer.

The design and Drawings shall be certified by the consultant organisation which carried out the design.

The documents produced by the design process shall include –

a) schematic Drawings of the complete irrigation system showing the number and sequence of watering stations and the locations of proposed water filters, water isolation valves irrigation controller and electrical isolation equipment;

b) detailed Drawings of the irrigation system showing all pipe installations, sprinkler or dripper emitters, manual or automatic valve details, backflow prevention devices, water filters, rain gauge/weather station, controllers, protection boxes and cabinets, electrical connections and water supply connections;

c) a schedule showing the rates of application of all water outlet devices;

d) material supply specifications;

e) installation specifications;

f) a commissioning schedule and checklist; and

g) a statement of the design warranty.

Prior to installation, the proposed design shall be submitted to the Administrator for a determination as to its suitability. Hold Point 1

7.4 Construction

The irrigation system shall be installed in accordance with the design and the relevant Australian Standard as listed in Clause 3.

All electrical installations shall be installed by a registered Electrical Contractor as defined under the *Electricity Act 1994*.

7.5 Commissioning

The entire irrigation system shall be flushed on completion of installation and each water outlet device shall be removed from the supply line.

Any high or low pressure sections of the irrigation system shall be tested at current local government supply pressure or design operating pressure respectively for a minimum period of 30 minutes.

Automatic controllers shall be tested by individually operating each solenoid valve from the irrigation controller. The irrigation system shall then be tuned and balanced so that the required quantity of water is delivered to each output device and the timer program set.

The Contractor shall provide training to the Administrator in the setting up and operation of the irrigation system.

The Contractor shall notify the Administrator in writing of the completion of the irrigation system prior to the joint commissioning of the irrigation system. Hold Point 2

7.6 Warranties, Manuals and As Constructed Drawings

The Contractor shall provide the construction and installation warranties required by Clause 37 of the *Supplementary Conditions of Contract*. All operating components shall be guaranteed for a minimum period of 12 months from the date that the irrigation system was commissioned.

The Contractor shall provide 5 hard copies of a comprehensive operating manual for the irrigation system, including a parts list which sets out the description and suppliers of all operating components.

The Contractor shall provide 5 hard copies (A3 format) of the As-constructed Drawings and specifications for the irrigation system, together with 1 copy in editable, electronic format.

8 SUPPLEMENTARY REQUIREMENTS

The requirements of MRTS16D *Hardscape Works* are varied by the supplementary requirements given in Clause 4 of Annexure MRTS16D.1.