

**Technical Specification**

**Transport and Main Roads Specifications  
MRTS267 Boom Barriers for Roadworks**

**November 2021**

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## 1 Introduction

This Technical Specification defines the design, performance, testing, warranty and documentation requirements for boom barriers for temporary traffic management. Boom barriers can be used stand-alone and/or incorporated as part of a Type-1 or Type-2 Portable Traffic Signals System (PTSS).

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements*, MRTS201 *General Equipment Requirements*, MRTS264 *Type-1 Portable Traffic Signals*, MRTS265 *Type-2 Portable Traffic Signals*, Queensland *Manual of Uniform Traffic Control Devices (MUTCD) Part 3 Traffic control for works on roads* and other Technical Specifications as appropriate. Documentation that details the installation, training and maintenance requirements shall be provided by the manufacturer.

Boom barriers complying with this Technical Specification shall only be used in accordance with the operational requirements of the [Queensland Guide to Temporary Traffic Management \(QGTMM\)](#) Part 3 *Static worksites*.

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

## 2 Definition of terms

The terms defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification. Additional terminology relevant to this Technical Specification are defined in Table 2.

**Table 2 – Definitions of terms**

Term	Definition
Act	<i>Radiocommunications Act</i> 1992 (Cth) and associated regulations and codes of practice.
Approach	That section of road, consisting of one or more lanes, used by vehicles approaching an intersection or mid-block site.
HRC	Hand-held Remote Controller.
Display	A signal aspect that is illuminated.
Manual operation	A signal operation method where each phase is individually controlled by manually entering a command for the next phase.
Master controller	The internal control processing unit hardware within the Master Portable Traffic Signal Unit, which undertakes all communication and internal processing tasks required for operation. This controller controls the Slave controller operations.
NATA	National Association of Testing Authorities, Australia.
Indicator beacons	Red LEDs affixed to boom barriers to draw attention and warn motorists about the boom barrier movements.
Operation modes	A set of system behaviours associated with a particular combination of hardware.
Portable Traffic Signal Unit (PTSU)	An individual portable traffic signal that consists of the traffic signal lantern, battery, communications equipment, mounting assembly and base.
Portable Traffic Signals System (PTSS)	Traffic light signals and associated equipment that provides signalling for temporary control of traffic at work sites.

<b>Term</b>	<b>Definition</b>
RPEQ	Registered Professional Engineer of Queensland.
Hand-held Remote Controller (HRC)	A hand-held remote / device which can control and set the PTSS lanterns at a safe distance. This device may be wired or wireless.
Slave controller	The internal control processing unit hardware within the slave PTSU, which undertakes all communication and internal processing tasks required for operation. This unit is subservient to the Master controller to which it is linked.
Traffic controller	A person who holds an appointment as an accredited person under section 21 of the <i>Transport Operations (Road Use Management) Act 1995 (Qld)</i> to perform the functions of a traffic controller as prescribed by <i>Transport Operations (Road Use Management - Accreditation and other provisions) Regulation 2015</i> .
Traffic signal lanterns	A set of lanterns used for traffic control.
Yellow time	Duration of the yellow signal for a phase or movement. This is static and pre-specified.

### 3 Reference documents

The requirements of the referenced documents listed in Table 3 of MRTS201 *General Equipment Requirements* and Table 3 following in this Technical Specification apply to this Technical Specification. Where there are inconsistencies between this Technical Specification and referenced MRTS documents, the requirements specified in this Technical Specification take precedence.

**Table 3 – Referenced documents**

<b>Reference</b>	<b>Title</b>
AS 1170.2	<i>Structural Design Actions – Wind Actions</i>
AS 1742.7	<i>Manual of Uniform Traffic Control Devices – Railway crossings</i>
AS 2144	<i>Traffic Signal Lanterns</i>
AS 2700	<i>Colour Standards for General Purposes</i>
AS 4191	<i>Portable Traffic Signals</i>
AS 60529	<i>Degrees of Protection Provided by Enclosures (IP Code)</i>
AS/NZS 4509.1	<i>Stand-alone Power Systems – Safety and Installation</i>
AS/NZS 4509.2	<i>Stand-alone Power Systems – System Design</i>
AS/NZS CISPR 32	<i>Electromagnetic compatibility of multimedia equipment – Emission requirements</i>
LIPD	<i>Low Interference Potential Devices – Class Licence 2015</i>
MRTS01	<i>Introduction to Technical Specification</i>
MRTS02	<i>Provision for Traffic</i>
MRTS50	<i>Specific Quality System Requirements</i>
MRTS61	<i>Gantries and Support Structures for Road Signs, Tolling Systems and ITS Devices</i>
MRTS201	<i>General Equipment Requirements</i>
MRTS264	<i>Type-1 Portable Traffic Signals</i>

Reference	Title
MRTS265	<i>Type-2 Portable Traffic Signals</i>
MUTCD Part 3	<a href="#"><u>Queensland Manual of Uniform Traffic Control Devices</u></a> (MUTCD) – <i>Part 3 Traffic control for works on roads</i>
Guideline – <i>Traffic Management at Works on Roads</i> , Chapter 5	<i>Guideline for Traffic Management at Works on Roads</i>

## 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 quality system requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification. Additional Hold Points and Witness Points applicable to this Technical Specification are summarised in Table 4. There are no Milestones defined.

**Table 4 – Hold Points, Witness Points and Milestones**

Clause	Hold Point	Witness Point	Milestone
4.2	<ol style="list-style-type: none"> <li>1. Samples for acceptance (design).</li> <li>2. Photometric performance certification.</li> </ol>		
5.1	<ol style="list-style-type: none"> <li>3. Barrow, tripod or trailer support structure design documentation.</li> <li>4. Detailed design documentation of the electrical wiring including charging assembly and calculations, signed by an RPEQ.</li> </ol>		
5.2.1 5.2.2		<ol style="list-style-type: none"> <li>1. Factory Acceptance Test.</li> <li>2. Boom Barrier Demonstration.</li> <li>3. Australian Communications and Media Authority Compliance.</li> <li>4. Site Acceptance Test.</li> </ol>	

### 4.2 Samples for acceptance

The requirements of MRTS201 *General Equipment Requirements* apply to this Technical Specification.

A sample PTSS for acceptance and photometric performance certification shall be provided 28 days prior to manufacture. **Hold Point 1** **Hold Point 2**

Detailed designs of the PTSS layout, fabrication and assembly drawings, calculations, specifications and certifications of the PTSS and associated components (signed by the Contractor's RPEQ) shall be submitted to the Principal via the Administrator for verification prior to manufacture.

## 5 Boom barrier requirements

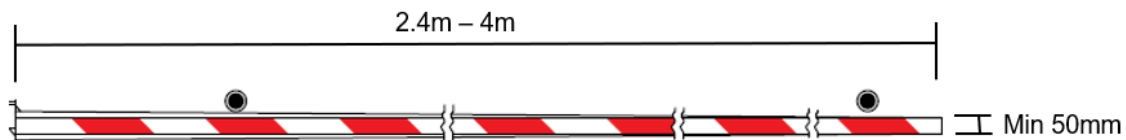
Boom barriers shall be operated via a Hand-held Remote Controller (HRC) as an extension of the operation of the PTSS. Stand-alone boom barrier operation must comply with the communications requirements outlined in MRTS264 *Type-1 Portable Traffic Signals* and MRTS265 *Type-2 Portable Traffic Signals*.

### 5.1 Physical requirements

The following are the required physical features of the boom barrier:

- a) Boom barrier dimensions:
  - i. the length of the boom shall be extendable from a minimum of 2.4 m to a maximum of 4 m, and
  - ii. the depth of the boom shall be a minimum of 50 mm.

**Figure 5.1 – Boom barrier dimensions**



- b) Indicator beacons shall have:
  - i. a solid red indicator beacon located 300 mm  $\pm$  10 mm from the end of the boom
  - ii. a flashing red indicator beacon located 1.2 m from the boom barrier pivot point
  - iii. a luminous intensity as per Table E1 of AS 2144 *Traffic Signal Lanterns*
  - iv. indicator beacons shall be mounted on top of the boom and shall be visible from both directions of travel as per AS 1742.7 *Manual of Uniform Traffic Control Devices Part 7 Railway Crossings*, and
  - v. a duty cycle of 50% at 1Hz  $\pm$  5%.
- c) The boom shall be retro-reflective with class 400 sheeting as per the requirements for R6-8 stop signs. Refer to AS1742.7 for further details.
- d) A separate power supply to be provided for boom barrier(s).
- e) An R6-8 stop sign shall be affixed to the boom barrier when operating as a stand-alone boom barrier. This sign shall be removable, reversible and suitably affixed to meet wind loading requirements. R6-8 shall not be used when the boom barrier is used with a set of traffic signals.
- f) When the boom is in the horizontal position, deviation from horizontal shall be no greater than 2 degrees. When the boom is in the vertical position, deviation from vertical shall be no greater than 2 degrees.

**Hold Point 3** **Hold Point 4**

## **5.2 Control requirements**

### **5.2.1 General**

The following are the general requirements for boom barrier control:

- a) The boom shall begin its lowering operation  $2 \pm 0.5$  seconds after a red traffic signal aspect is displayed.
- b) The boom barrier shall completely raise or lower  $4.5 \pm 0.5$  seconds after receiving a command to do so.
- c) The indicator beacons shall be active during the traffic signal red intervals to warn motorists and/or pedestrians of:
  - i. the presence of the boom, and
  - ii. the pending lowering of the boom.
- d) The indicator beacons shall turn off once the boom has risen to the vertical position.
- e) The boom shall be in the vertical position before the traffic signal lantern changes to green and shall remain in the vertical position for the duration of the green interval.
- f) An audible alarm shall alert pedestrians and/or motorists at the start of the yellow interval that lowering of the boom barrier is imminent. The audible alarm shall cease when the boom is in its horizontal position.
- g) The volume, frequency and duty cycle of the audible alarm shall be as follows:
  - i. volume: 70 – 75 decibels
  - ii. frequency: Max 15KHz, and
  - iii. duty cycle: 50% at  $1\text{Hz} \pm 5\%$ .
- h) In conjunction with the boom barrier, a detection device shall be implemented to ensure that the area underneath the boom is clear of obstructions. Lowering operation is to be stopped and the boom barrier raised temporarily if an obstruction is detected. The audible alarm is to continue for the entire lowering operation.
- i) Operation of the audible alarm is to be included in the self-test procedure for both PTSS and stand-alone installations.

When used in conjunction with Type-1 PTSS, the signal head controller shall be the master controller and the boom barrier shall be a slave controller.

### **5.2.2 Stand-alone**

When the system is intentionally set up without signal lanterns, the master controller shall communicate directly with the boom barrier controller instead of via the signal lanterns.

**Witness Point 1 | Witness Point 2 | Witness Point 3 | Witness Point 4**



### **5.3 Faults**

#### **5.3.1 General**

The following system behaviours under fault conditions shall be implemented. All faults of the HRC or signal lanterns, shall comply with MRTS264 *Type-1 Portable Traffic Signals* and/or MRTS265 *Type-2 Portable Traffic Signals*. Boom barrier and indicator beacon faults are not considered critical faults when portable signals are also used.

- a) If the boom barrier cannot be raised or lowered, operators shall be notified via the HRC as per MRTS264 *Type-1 Portable Traffic Signals* and/or MRTS265 *Type-2 Portable Traffic Signals* and manual relocation of the boom shall be possible. Once the boom has been relocated such that it cannot obstruct traffic, operation shall continue without the boom barrier.
- b) If a signal aspect failure is detected while a boom barrier is connected and operational, the signal aspects are to be turned off and operation is to continue without the portable traffic signals.
- c) If an indicator beacon failure is detected, the beacons are to be turned off and operation of the system is to continue.
- d) When the battery is running critically low, the boom barrier shall return to the raised position (vertical) and remain there until the battery is charged or replaced.
- e) Force applied to the boom barrier in excess of the rated wind-loading shall cause the boom barrier to rotate horizontally around the pivot point, until the boom barrier is clear of traffic.

#### **5.3.2 Stand-alone**

When operating without portable signals, any fault that involves the raising or lowering of the boom shall be considered a critical fault. The boom barrier shall cease operation until the fault is rectified and self-test is completed successfully.

## **6 Warranty provisions**

The warranty requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

## **7 Training requirements**

The training requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

## **8 Maintenance requirements**

The maintenance requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

## **9 Handover requirements**

The handover requirements defined in MRTS201 *General Equipment Requirements* apply to this Technical Specification.

