



**Transport  
for NSW**

***Transport for New South Wales***

***TRAFFIC SYSTEMS***

**SPECIFICATION NO. TSI-SP-049**

**PORTABLE TRAFFIC SIGNAL SYSTEMS**

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## RECORD OF AMENDMENTS

| Issue     | Summary  | Date       | Approved by |
|-----------|--|------------|-------------|
| 0.1 draft | Original based on AS4191.<br>Supersedes specifications PTS/3 Parts A and B | 22/3/2017  |             |
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## 1 SCOPE

This specification covers the general requirements for portable traffic signal systems (PTS) to be used in the state of NSW to control vehicular traffic, typically used to provide temporary control at roadworks.

Note: This document supersedes the prior RMS specifications for portable traffic light signals; PTS/3 part A and PTS/3 part B.

## 2 REFERENCES AND APPLICABLE DOCUMENTS

### 2.1 Australian and International Standards

- [1] AS 4191 – Portable traffic signal systems
- [2] ISO 9001 – Quality Management System

### 2.2 TfNSW Documents

- [3] TS201 – Approval of ITS Field Equipment
- [4] TSI-SP-062 – User manual requirements for ITS equipment
- [5] TSI-SP-081 – Type 1 Portable Traffic Signals with Boom Barrier

### 2.3 Other Documents

- [6] NSW Work Health and Safety Act 2011

## 3 DEFINITIONS AND GLOSSARY OF TERMS

For the purposes of this Specification, the following definitions and abbreviations shall apply:

- Boom Barrier – A mechanical device that extends from a PTS unit to allow or prevent vehicular traffic and/or pedestrian flow into a controlled work zone.
- Display Lantern – a 3 aspect (red, yellow, green) traffic lantern.
- HRC – Hand-held Remote Controller.
- TfNSW – Transport for New South Wales.
- PTS – Portable Traffic (signal) System as defined in this specification TSI-SP-049.
- PTSU – Portable traffic signal unit, a display lantern with its mechanical support.
- Traffic Controller – A trained person whose duty is to control traffic at work sites. This control is normally exercised by the use of STOP/SLOW bats, but may be by manual control traffic signals or other device.
- Type 1 PTS – Portable Traffic Signal System as defined in specification TSI-SP-059, i.e. a HRC with one or two linked PTSU(s).
- Type 1 PTS-B – Portable Traffic Signals with Boom Barrier System as defined in specification TSI-SP-081; i.e. a HRC with one or two linked PTSU(s) and Boom Barrier/s.

## 4 PORTABLE TRAFFIC SIGNAL SYSTEM COMPARISON

Attached is the key comparison of differences in features between the TfNSW Type 1 PTS-B traffic signal system and the TfNSW Standard PTS:

| Feature                        | Type 1 PTS-B                                   | Standard PTS  |
|--------------------------------|--|---|
| Operation                      | Manual   | Manual/Unattended   |
| Operator Controls              | Hand-held Remote Controller                    | Hand-held Remote Controller, Local Control Panel                    |
| Battery Capacity               | 12 hours operation                             | Seven sun free days   |
| Solar System                   | Optional                                       | Optional  |
| Mass of each PTSU              | Suitable for manual handling                   | No limit  |
| Target Board with White Border | Required                                       | Required  |
| Data Logging                   | Optional                                       | Optional  |
| Time Settings                  | Non-configurable<br>(Yellow time four seconds) | Configurable  |
| Dimming                        | Required                                       | Required  |
| Visors                         | Required                                       | Required  |
| Power                          | Batteries only                                 | Various   |
| Boom Barrier                   | Required                                       | Optional – in Manual Shuttle control or Plant-crossing control only |

## 5 REQUIREMENTS

### 5.1 Compliance to AS4191

The portable traffic signal system shall meet the requirements of AS4191 [1].

### 5.2 Portability alternatives

Portability for PTS systems is traditionally provided by building the system into a trailer. However, AS4191 [1] does not limit the arrangements for a PTS system to this method.

Suppliers may offer alternative arrangements. If alternatives are offered, the supplier shall describe the arrangement, and detail related advantages, limitations, constraints, and transport and deployment methodologies.

### 5.3 Specialised PTS

The standard AS4191 [1] upon which this specification is based describes a standardised PTS arrangement, able to perform all normal tasks.

A supplier may as an alternative offer a specialised PTS, which exchanges some lack of functionality for one application (evident as non-conformance, typically leading to usage constraints), for benefits in another. In such a case the supplier shall apply under this specification, describing in addition to the items normally required:

5.3.1 Intended method and area of use;

5.3.2 Benefits, limitations and differences of the specialised PTS;

- 5.3.3 Methods and constraints proposed to manage limitations and differences;
- 5.3.4 Areas of non-conformance to this specification;
- 5.3.5 Mitigations for non-conformances and risks with supporting evidence.

## **5.4 Safety**

The portable traffic signal system shall comply with the requirements of the NSW Work Health and Safety Act [6].

## **5.5 Generic Compliance**

All equipment and materials, where not otherwise specified, shall be in accordance with Australian Standards and TfNSW Specifications where such exist, and in their absence, with appropriate IEC and ISO Standards/Specifications.

## **5.6 Documentation**

User manuals shall be compliant to TSI-SP-062 [4].

## **5.7 Wind loading**

The PTS shall meet the requirements of AS4191 [1], for Region A, Terrain category 2, as a minimum requirement.

The coastal strip of NSW north of Coffs Harbour is classed as region B. The PTS shall also meet the region B requirements if the PTS is to be granted approval for use in this region.

## **5.8 Statutory Requirement Certification and Labelling**

The equipment shall be certified for applicable statutory requirements such as for:

- 5.8.1 Electrical safety per AS4417 (Level 3, as AS4191 requires a mains connection);
- 5.8.2 Electromagnetic compatibility;
- 5.8.3 Radio communications (if wireless communications are used).

Certified equipment shall be labelled as specified under statutory regulations, with the applicable regulatory compliance labels.

# **6 QUALITY ASSURANCE AND CONTROL**

## **6.1 Quality System**

The Supplier and the manufacturer shall operate a quality management system complying with ISO 9001, certified by an accredited quality management system certification body.

## **6.2 Quality Plan**

The manufacturer shall document and provide a quality plan including details of quality control tests, sampling, and records to be made by the manufacturer during manufacture and release. A copy of this quality plan shall be provided to TfNSW as part of the approval process. Acceptance of this quality plan by TfNSW is a prerequisite to gaining overall approval.

### 6.3 Quality Audits

RMS reserves the right to examine the Manufacturer's quality records pertaining to an order that is on behalf of TfNSW. TfNSW also reserves the right to arrange for an independent quality audit concerning items in contract.

## 7 BOOM BARRIER

A Boom Barrier may be added as an optional design feature to the PTS system. This feature shall be used in-conjunction with a Traffic Controller and HRC only.

### 7.1 Mechanical and Physical Properties

The PTS Boom Barrier arm shall:

- (a) be made from a light, durable and UV resistant material and be capable of being removed by one person using tool for transport or faults;
- (b) extend outward a minimum three (3) metres from its mounting point, and have a means to be extended at least 1 metre to cater for wider road lanes. The extension shall be internally coupled with sufficient internal overlap, at least 50% of the exposed extension length, to provide horizontal stability. The boom arm and its' extension shall be secure and tethered to prevent the boom arm or the extension becoming a projectile from an impact. In its lowered (horizontal) position, the bottom of the Boom Barrier arm shall be at a height of 1 metre  $\pm$ 10 cm above the road surface;
- (c) be able to automatically move into any one of two positions:
  - (i) raised (vertical); and,
  - (ii) lowered (horizontal)
- (d) not interfere with viewing of the traffic signal lantern aspects at any time;
- (e) have LED flashing warning lights along the front and, optionally, the rear, to have a visual warning that the barrier will be moved;
- (f) be accompanied by a safety device, such as an ultrasonic sensor, to prevent the barrier lowering into the horizontal position due to an obstruction;
- (g) not prevent the traffic signal timings of the PTS system be halted or changed, unless a critical fault condition has been detected.

#### 7.1.1 Flashing Warning Lights

The PTS Boom Barrier arm shall have red LED flashing warning lights (beacons or an array) along its extension and visible to motorists and/or pedestrian from either direction. A minimum of two warning lights are to be visible for each direction.

The flashing warning lights shall be:

- (a) highly visible both by day and night, particularly in bright sunlight, to provide a visual warning of impending movement or fault;
- (b) waterproof ; and
- (c) dimmable for night use.

## 7.2 Control Types

The control types with a Boom Barrier shall be compliant to Clause 2.1 of AS4191 [1].

## 7.3 Modes of Operation

The modes of operation with a Boom Barrier shall be compliant to Clause 2.2(a) of AS4191 [1].

In the modes of operation listed in Clause 2.2(b), 2.2(c) and 2.2(d) of AS4191, the Boom Barrier shall be in the vertical position at all times and not obstruct the view of the traffic signal lantern.

## 7.4 Manual Operation

In manual mode of operation with a Boom Barrier shall be compliant to Clause 2.3.3 and Clause 2.5 of AS4191 [1].

The Boom Barrier shall close into the horizontal position with its red LED beacons or LED flashers flashing while the All-Red is displayed.

## 7.5 Control Requirements for Boom Barrier

The following control requirements shall be implemented:

- a) The red LED beacons or LED arrays shall flash during the traffic signal red intervals to warn motorists and/or pedestrians of the pending lowering of the horizontal barrier.
- b) Whilst the Boom Barrier is in the horizontal position (lowered), the red LED beacons or LED arrays shall continue to flash.
- c) The red LED beacons or LED arrays will cease to flash once the Boom Barrier begins to rise (vertical) into position.
- d) Ensure the Boom Barrier is in the vertical position for the duration of the Green interval.
- e) An audible alarm shall alert pedestrians and/or motorists at the start of the Yellow interval that the Boom Barrier will be lowered.
- f) The audible alarm shall cease when the Boom Barrier is in its vertical or horizontal position.
- g) In conjunction with the Barrier Boom, a safety device shall be used, such as an ultrasonic sensor, to ensure that the area of the Boom Barrier is clear of obstructions.

## 7.6 Sequence and Timing

The requirement of Clause 2.9.1 of AS4191 [4] applies.

The length of time that red and green shall be displayed will be controlled by the Traffic Controller using the HRC.

The Boom Barrier's red LED warning lights shall flash during the red interval.

If the Boom Barrier is in the vertical position, and if no obstructions are detected then it shall be lowered into the horizontal position during the All-Red interval.

The Boom Barrier shall be raised from the horizontal position so as to be in the vertical position at the start of the Green interval. There shall be no delay between the Boom Barrier reaching the vertical position and the start of the Green.



The total travel time for the Boom Barrier to its alternate vertical or horizontal position shall be less than 3.0 seconds.

## **8 APPROVAL**

### **8.1 Approval Process**

- a) To gain approval of the portable traffic signal system, the supplier shall follow the process defined in TS201 (ref. [3]).
- b) If requested by TfNSW, the supplier shall provide a sample PTS system together with accessories, for TfNSW to evaluate.
- c) Regarding wind capability, the supplier shall state whether they are seeking approval to cover Region B in addition to Region A, (or other terrain categories) and provide evidence accordingly. Approval if granted will be limited to regions and terrain for which capability has been demonstrated and accepted.