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1 SCOPE

1.1 Purpose

This specification covers the general requirements for the integrated aspect containing both a “red symbolic standing pedestrian” symbol and a countdown timer, referred to as pedestrian countdown timers (PCT). When deployed on traffic intersections, these display the period, in seconds, remaining to complete crossing the intersection instead of the flashing “red symbolic standing pedestrian” symbol.

This specification includes requirements for the design, performance and quality assurance of pedestrian countdown timers (PCT) only.

1.2 Usage

Pedestrian Countdown Timers are intended for the control of pedestrian traffic or movements only, and shall only be used on traffic intersections where an exclusive pedestrian phase is active and no conflicting vehicle phases are active.

Pedestrian Countdown Timers shall only be used where there is a fixed pedestrian clearance period. They shall not be used at sites with variable pedestrian clearance periods, as this can introduce a safety risk.

2 REFERENCES AND APPLICABLE DOCUMENTS

2.1 Australian Standards

[8] AS 60529 – Degrees of protection provided by enclosures for electrical equipment (IP Code)

2.2 Roads and Maritime Services Documents

[10] TS201 – Approval of ITS Field Equipment
2.3 Other Documents


3 DEFINITIONS AND GLOSSARY OF TERMS

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

- **PCT** – Pedestrian Countdown Timer

4 OVERALL REQUIREMENTS

4.1 Diagram

4.1.1 The general arrangement of a typical Pedestrian Countdown Timer (PCT) lantern, where the countdown timer and "red symbolic standing pedestrian" displays are integrated into the upper lantern aspect, is shown in Figure 1 below. A representation of all three states is shown for clarity.

Note that when the PCT lanterns are operating without error, the time remaining in the pedestrian clearance period is displayed in preference to the intermediate "Flashing red symbolic standing pedestrian" state displayed by standard pedestrian lanterns.

![Figure 1 – General Arrangement of Pedestrian Countdown Timer Lantern](image)

4.2 Compliance with Existing Standards and Specifications

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

4.2.2 The equipment and installation shall comply with the requirements of the NSW Work Health and Safety Act.
4.2.3 The PCT shall be indelibly marked with the approval number or numbers shown on the Certificate of Suitability/Certificate of Compliance, alongside the Regulatory Compliance Mark (RCM), in accordance with AS/NZS 4417.1 (Ref. [7]).

4.2.4 The PCT shall comply with AS 2144 (Ref. [4]) and enhanced by TSI-SP-045 (Ref. [9]) except where defined otherwise in this Specification.

4.2.5 The PCT shall operate from the walk/don’t walk signal group outputs provided by an RMS type-approved Traffic Signal Controller.

4.2.6 The dimensions and mass of the combined “red symbolic standing pedestrian”/PCT signal aspect shall comply with AS 2144 (Ref. [4]), allowing the aspect to be retrofitted into existing 200mm or 300mm pedestrian signal lantern assemblies as a direct replacement for standard aspects.

4.2.7 The combined “red symbolic standing pedestrian”/PCT signal aspect shall be capable of displaying the states specified in items (b), (c) and (d) of AS1742.14 (Ref. [2]), Section 2.4.

The expected display sequence of a PCT lantern, when operating without error outside its initial “self-learning” period, shall be as follows:

(a) “Green symbolic walking pedestrian” – allows pedestrians to proceed to cross the roadway.

(b) “Pedestrian countdown timer” – indicates the number of seconds left (stopping at ‘1’) before the pedestrian clearance period concludes and the “Steady red symbolic standing pedestrian” is displayed.

(c) “Steady red symbolic standing pedestrian” – indicates that pedestrians are not to leave the footway or refuge.

4.2.8 The “green symbolic walking pedestrian” and “red symbolic standing pedestrian” symbol shall remain compliant with AS 2144 (Ref. [4]). Animated versions of these symbols shall not be displayed on the PCT.

5 PEDESTRIAN COUNTDOWN TIMER REQUIREMENTS

5.1 Display Requirements

5.1.1 The PCT shall be capable of displaying digits between 1 and 99 inclusive, representing the time in seconds remaining within the pedestrian clearance period.

5.1.2 The PCT shall not overlay the display of two consecutive digits simultaneously.

5.1.3 The PCT shall activate all necessary light sources required to display a digit simultaneously.

5.1.4 The PCT shall transition between digits without perceptible flashing or blanking out of the display.

5.1.5 There shall be sufficiently even light intensity across the PCT display such that the digits are clearly legible and not distracting to pedestrians meeting visual acuity requirements for driver licensing.

**NOTE:** Minimum visual acuity requirements for driver licensing are defined in Austroads Document AP-G56-13 (Ref. [11]).

5.1.6 The PCT shall not precede single digits with a zero – for example, the PCT shall display “5” rather than “05”.

PEDESTRIAN COUNTDOWN TIMERS (Copyright Roads and Maritime Services 2016)
5.1.7 The digits displayed on the PCT shall be positioned within a bounding box sharing a common centre with the roundel. This bounding box must be a rectangle or other parallelogram, with its longer pair of sides placed horizontally.

5.1.8 The two digits displayed on the PCT shall be positioned within the bounding box, such that the digits maintain a right margin of 5.8% of the length of the longer side of the bounding box (Figure 2, dimension $m$). The margin of the right hand digit shall be measured from the right hand side of the bounding box. The margin of the left hand digit shall be measured from the centre line which bisects both of the longer pair of sides of the bounding box (Figure 2, dashed line). Single digits shall be displayed using the right hand digit.

5.1.9 The length of the longer side of the bounding box (Figure 2, dimension $L$) shall be at least 140% of the length of its shorter side (Figure 2, dimension $s$). For rectangular bounding boxes, this corresponds to a minimum aspect ratio of 1.4:1.

5.1.10 The vertical height of the bounding box (Figure 2, dimension $h$), shall be at least 50% of the nominal roundel diameter.

5.1.11 The digits displayed on the PCT shall utilise 100% of the height of the bounding box (i.e. no top or bottom margin).

NOTE: To satisfy this requirement, the light source shall extend to the upper and lower edges of the bounding box.

5.1.12 All digits displayed on the PCT, with the exception of the numeral “1”, shall possess a character width between 36% and 40% of the length of the longer side of the bounding box (Figure 2, dimension $a$).

NOTE: There will be residual blank space to the left of each digit.

5.1.13 The digits displayed on the PCT shall possess a stroke width between 10% and 15% of the character height.

NOTE: The minimum dimensions of the bounding box, along with the minimum character height and margins between characters (Sections 5.1.4 to 5.4.9) are derived from the dimensions of the “0” character of the Series C Standard Alphabet, defined in Table 2 of AS1744:2015 (Ref. [3]).
NOTE: When displayed with a height of 100mm, the “Series C” characters are said to have a legibility distance of 50 metres for 85% of persons meeting minimum visual acuity requirements for driver licensing (Table 1, AS1742.1:2014 (Ref [1]).

5.2 General Requirements

5.2.1 The PCT shall have an internal timekeeping device capable of recording the duration of events to a resolution of 0.01 second.

NOTE: The supplier shall provide details of the methodology used by the PCT for timekeeping.

5.3 Start-up Requirements

5.3.1 After initial power-up of the PCT, the PCT shall:

(a) Display a “flashing red symbolic standing pedestrian” signal during the first full pedestrian clearance period encountered after initial power-up; and

(b) Record the duration of the pedestrian clearance period.

5.3.2 The PCT shall commence recording the duration of the pedestrian clearance period once the “green symbolic walking pedestrian” symbol de-activates.

5.3.3 The PCT shall continue recording the duration of the pedestrian clearance period while the pulse timing of the “flashing red symbolic standing pedestrian” signal received from the Traffic Signal Controller is active.

NOTE: Section 2.3 of AS1742.14 (Ref. [2]), suggests that the duration of each pulse provided by the Traffic Signal Controller will be between 369 milliseconds and 655 milliseconds.

5.3.4 The PCT shall cease recording the duration of the pedestrian clearance period once the “steady red symbolic standing pedestrian” symbol is activated. The “steady red symbolic standing pedestrian” symbol is deemed to have been activated exactly 655 milliseconds prior to the time the PCT detects the “Don’t Walk” signal group output has been active for a period of 655 milliseconds or greater.

A state diagram showing the state of the “Walk” and “Don’t Walk” signal group outputs for an intersection with a pedestrian clearance period of twelve seconds is shown as Figure 3 below. The start point and end point of the pedestrian clearance period are labelled. The 655 millisecond point at which the PCT can detect that the “steady red symbolic standing pedestrian” symbol is activated is also labelled.

![Figure 3 – State diagram of “Walk” and “Don’t Walk” signal group outputs](image)

5.3.5 The recorded pedestrian clearance period shall be rounded down to an integer in seconds.
5.4 Normal Operation

5.4.1 Once the PCT has established the duration of the pedestrian clearance period, the PCT shall count down from a value equalling the recorded pedestrian clearance period, in preference to displaying the “flashing red symbolic standing pedestrian” signal.

5.4.2 During the pedestrian clearance period, the numeric value displayed by the PCT shall decrement by one, at intervals of one second.

5.4.3 The PCT shall transition from a numeric value of one (“1”) to the “steady red symbolic standing pedestrian” state when the internal timer has reached a value of zero.

5.4.4 The PCT shall not display a numeric value of zero (“0”).

5.4.5 The PCT shall not trigger a false lamp failure on the Traffic Signal Controller, irrespective of what numeric value is being displayed.

5.4.6 Operation of the PCT shall not be interrupted when the Traffic Signal Controller enters or leaves a dimming mode, for any accepted method of dimming.

5.4.7 The brightness of the PCT aspects shall be adjustable, conforming to dimming functionality in AS 2144 (Ref. [4]) and enhanced by TSI-SP-045 (Ref. [9])

5.4.8 The PCT shall not be capable of displaying a countdown sequence simultaneously with the “flashing red symbolic standing pedestrian” signal.

5.5 Fault Operation

5.5.1 In the event an error is detected while the PCT display is active, the PCT shall abort its countdown sequence within a period of one second, and instead display the “flashing red symbolic standing pedestrian” signal.

5.5.2 In the event the PCT is aborted due to an error condition, the PCT shall not activate on all subsequent pedestrian clearance periods, until it is reset by power cycling the PCT lantern.

5.5.3 The PCT shall abort its countdown sequence within a period of 100 milliseconds and provide a blank display when any of the following conditions are detected:

   (a) Power Loss (noting that the on/off pulses of the “flashing red symbolic standing pedestrian” signal group are considered normal operation); or

   (b) Reset of the Traffic Signal Controller;

5.5.4 The PCT shall monitor the countdown display for any failures which reduce the legibility of the countdown display. If such a failure is detected, the PCT shall abort its countdown sequence in conformance with Clause 5.5.1.

5.5.5 If the PCT detects a failure of the “red symbolic standing pedestrian” aspect, the PCT shall trigger a lamp fault with the Traffic Signal Controller.

6 APPROVAL

6.1 Overall Approval for a Specific Application

To gain overall approval of a Pedestrian Countdown Timer, the supplier shall follow the process defined in TS201 (ref. [10]),
6.2 Certificate of Suitability

The equipment manufacturer or Supplier shall obtain a NSW Certificate of Suitability for any equipment capable of being powered from the mains supply to ensure that the equipment meets minimum electrical safety requirements. Once a Certificate of Suitability is issued, it is the manufacturer’s and Supplier’s responsibility to ensure that the equipment complies with any subsequent amendments to State Regulations and Australian Standard Specifications relative to electrical safety.

If the design of the equipment is changed, it is necessary for the manufacturer/Supplier to have the Certificate of Suitability endorsed accordingly.

Where a Certificate of Suitability or an equivalent document is issued in another state, the Supplier shall obtain written evidence from the appropriate NSW government office that such Certificate or document is regarded as fully equivalent to a Certificate of Suitability issued by the NSW government office.

7 QUALITY ASSURANCE

7.1 General

The Supplier and the manufacturer shall operate a quality management system complying with ISO 9001.

7.2 Third Party Accreditation

The quality management system shall be certified by a quality management system certification body either accredited under the criteria laid down in the Joint Accreditation System of Australia and New Zealand (JAS-ANZ), or listed in the International Standards Organisation ISO Directory of ISO 9000 and ISO 14000 Accreditation and Certification Bodies.

7.3 Quality Plan

The manufacturer shall document a quality plan appropriate to the item detailing the quality control tests and assessments the manufacturer will conduct during manufacture prior to release. This shall include sampling plans and test frequency, and a description of the records to be made, as relevant.

A copy of this quality plan shall be provided by the supplier to Roads and Maritime as part of the approval process. Acceptance of this quality plan by Roads and Maritime is a prerequisite to gaining overall approval of a PCT design.

7.4 Quality Audits

Roads and Maritime reserves the right to examine the Manufacturer's quality records pertaining to any order for PCT. Roads and Maritime also reserves the right to arrange for an independent quality audit concerning PCT in contract.
8 TESTING AND INSPECTION

8.1 Routine Production Tests

Tests and assessments shall be carried out by the manufacturer before Pre-delivery Acceptance Testing, as defined in the manufacturer’s quality plan.

9 WARRANTY

Purchase of any items under this Specification shall be subject to a warranty period, to be confirmed by the Tenderer, of not less than 24 months following the date of despatch from the Manufacturer’s Works or Agent’s Premises to the Roads and Maritime Store. Any PCT failed in service or found to be defective within 24 months of the date of despatch will be delivered to the Supplier, who shall then make good the defect, arrange to have the defect made good or replace the PCT with another, and subsequently return the good unit to Roads and Maritime at no charge to Roads and Maritime. Unless otherwise agreed, defective CMS shall be processed and returned within 60 calendar days from the date the Supplier is notified by Roads and Maritime Services of the defect.

It is expressly understood that any PCT which has failed as a result of a traffic accident, abuse or act of vandalism after delivery to Roads and Maritime will not be covered by warranty provisions.

10 DOCUMENTATION TO BE SUPPLIED

The Supplier shall submit the following documentation, as a minimum, in support of a submission for approval for the PCT via email to the ITS HelpDesk (ITSHelpDesk@rms.nsw.gov.au) for Approval by the ITS Principal:

(a) A quality plan for the PCT containing details of all tests undertaken during the manufacturing process (ref. Section 7.3).

(b) Installation manual containing all information required for the installation of the PCT and any other associated equipment. This manual shall not depend on the presence of any other (separately bound) documentation or manual and shall present the information in a manner and sequence that is relevant to the installation procedure.

(c) Operations manual detailing the operation of the PCT

(d) Maintenance manual including preventative (routine) maintenance procedures and recommended maintenance schedules, if any. Fault maintenance procedures covering the replacement of key components in the event of failure shall be provided.

(e) Reference mechanical drawings of all supplied equipment.

(f) Certificate of Suitability/Certificate of Compliance for the PCT.

Failure to provide the full information called for in this section shall render the submission liable to rejection.