ROADS AND MARITIME SERVICES

TRAFFIC SYSTEMS

SPECIFICATION NO. TSI-SP-072

ILLUMINATED TRAFFIC SIGNS

Issue: 2.0
Dated: 6/5/2019
DISCLAIMER AND CONDITIONS FOR USE OF THIS SPECIFICATION

This Specification has been prepared by Roads and Maritime Services (referred to herein as RMS) for use, insofar as it is applicable, in the State of New South Wales for equipment supplied under an RMS order or contract, or under an order or a contract from another party that is required in writing by RMS to use this Specification.

The use of this RMS Specification other than by those parties stated above and in the manner stated above is not recommended or authorised by RMS. Any such use is entirely the decision of the user alone. RMS disclaims all responsibilities and liabilities arising whether directly or indirectly from any such use. RMS does not warrant that this Specification is error free, nor does RMS warrant the suitability, fitness or otherwise of this Specification for any stated or implied purposes expressed or implied in this Specification or other documents. By using this Specification, the user agrees to indemnify RMS against the full amount of all expenses, losses, damages and costs (on a full indemnity basis and whether or not incurred by or awarded against RMS) which may be suffered by any person or RMS in connection with or arising out of the use of this Specification in any manner.

RMS is not under any duty to inform you of any errors in or changes to this Specification.
## RECORD OF AMENDMENTS

<table>
<thead>
<tr>
<th>Issue</th>
<th>Summary</th>
<th>Date</th>
<th>Approved by</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Official release</td>
<td>26 Oct 2018</td>
<td>TSI Manager</td>
</tr>
<tr>
<td>2.0</td>
<td>Fix display picture error, update statutory requirements, and incorporate dimming</td>
<td>6 May 2019</td>
<td></td>
</tr>
</tbody>
</table>
C O N T E N T S

1 SCOPE ................................................................................................................................. 6
2 REFERENCES AND APPLICABLE DOCUMENTS ................................................................ 6
   2.1 AUSTRALIAN STANDARDS ............................................................................................. 6
   2.2 RMS DOCUMENTS .......................................................................................................... 6
   2.3 RMS SIGN DRAWINGS .................................................................................................. 6
   2.4 RMS ENGINEERING DRAWINGS .................................................................................. 6
   2.5 NSW LEGISLATION ......................................................................................................... 6
3 DEFINITIONS AND GLOSSARY OF TERMS ........................................................................ 6
4 DISPLAY GRAPHIC DESIGN .................................................................................................. 8
   4.1 DESIGN BASIS .............................................................................................................. 8
       4.1.1 Graphic Design Information ..................................................................................... 8
       4.1.2 Illuminated Sign Graphic Design ............................................................................. 8
   4.2 DISPLAY FOR R2-4 ‘NO ENTRY’ SIGN .......................................................................... 8
       4.2.1 Dimension ................................................................................................................ 8
       4.2.2 Display ..................................................................................................................... 8
   4.3 DISPLAY FOR R2-6L ‘NO LEFT TURN’ AND R2-6R ‘NO RIGHT TURN’ SIGNS ............. 8
       4.3.1 Dimension ................................................................................................................ 8
       4.3.2 Display ..................................................................................................................... 9
5 PHOTOMETRIC PERFORMANCE ............................................................................................. 9
   5.1 LUMINANCE ................................................................................................................... 9
   5.2 DIMMING ....................................................................................................................... 9
6 MECHANICAL REQUIREMENT ................................................................................................ 9
   6.1 MOUNTING ..................................................................................................................... 9
       6.1.1 Mounting for No Left Turn R2-6L and No Right Turn R2-6R Signs ....................... 9
       6.1.2 Mounting for No Entry R2-4 Sign ............................................................................ 9
6.2 Access to Optical System ................................................................. 10
6.3 Sealing of Optical System ................................................................. 10
6.4 Material and Method of Construction ................................................. 10
6.5 Surface Finish .................................................................................... 10
6.6 Weather Resistance ........................................................................... 10
6.7 Operation Temperature ....................................................................... 10

7 ELECTRICAL REQUIREMENT ................................................................. 10
7.1 Compliance with AS/NZ 3100 ............................................................... 10
7.2 Provision of Connection to Supply ....................................................... 10
7.3 Activation Mode .................................................................................. 10
7.4 Electromagnetic Compatibility ............................................................. 11

8 OPTICAL SYSTEM COMPONENTS AND ANCILLARY DEVICES ............. 11
8.1 Assembly of Optical System ................................................................. 11
8.2 Properties of Optical Components ....................................................... 11
8.3 LED Arrays ......................................................................................... 11
8.4 Visors ................................................................................................. 11

9 QUALITY ASSURANCE AND CONTROL ............................................... 11
9.1 General ............................................................................................... 11
9.2 Third Party Certification ...................................................................... 11
9.3 Quality Plan ....................................................................................... 11
9.4 Quality Audits ................................................................................... 11

10 APPROVAL ............................................................................................ 11
1 SCOPE

This specification outlines the technical requirements for illuminated versions of the following traffic signs:

- No Entry R2-4 [8]
- No Left Turn R2-6L [9]
- No Right Turn R2-6R [10]

2 REFERENCES AND APPLICABLE DOCUMENTS

2.1 Australian Standards

[1] AS2144 Traffic signal lanterns
[2] AS/NZS 3000 Electrical installations (known as the Australian/New Zealand Wiring Rules)

2.2 RMS Documents

[7] TS201 Approval of ITS Field Equipment

2.3 RMS Sign Drawings

[8] R2-4 No Entry Sign
[9] R2-6L No Left Turn
[10] R2-6R No Right Turn

2.4 RMS Engineering Drawings

[11] VM012-19 Special fixed "Z" bracket for Illuminated "No Right Turn" Sign

2.5 NSW Legislation

[12] NSW Road Rules 2014 (Rule 316)

3 DEFINITIONS AND GLOSSARY OF TERMS

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

ILLUMINATED TRAFFIC SIGNS  (Copyright RMS 2019)
RMS Roads and Maritime Services, a New South Wales government agency
4 DISPLAY GRAPHIC DESIGN

4.1 Design Basis

4.1.1 Graphic Design Information
Traffic sign design detail information is available on the RMS internet website, under Business and Industry/Partners & suppliers/Signage/Traffic Signs.

4.1.2 Illuminated Sign Graphic Design
The illuminated sign's graphic design shall be substantially as for the equivalent standard traffic sign, noting that a degree of variation is permitted as defined in Rule 316 of the NSW road rules [12].

4.2 Display for R2-4 ‘No Entry’ sign
The following display requirements shall be met for the R2-4 sign [8]:

4.2.1 Dimension
The dimensions for a “No Entry” sign are detailed in RMS Drawing No R2-4-4 [8]. The R2-4A size sign shall be used.

4.2.2 Display
The display shall comprise a red annulus with a white bar in its centre, and white text below; all on a matt black background, as illustrated below.

![No Entry Sign](image)

Note: The text “NO” is a larger font than the other text.

4.3 Display for R2-6L ‘No Left Turn’ and R2-6R ‘No Right Turn’ Signs
The following display requirements shall be met for the R2-6 signs [9] [10]:

4.3.1 Dimension
The nominal dimensions of the sign shall be as detailed in RMS Drawing No’s. R2-6L [9] and R2-6R [7]. The R2-6A size sign shall be used.
4.3.2 Display

The display shall comprise a red annulus and slash, over a white arrow, with white text, all on a matt black background, as illustrated below.

Note: The text “NO” is a larger font than the other text.

5 PHOTOMETRIC PERFORMANCE

5.1 Luminance

The luminance shall be as a minimum of 4,000 cd/m$^2$ for white; and 2,200 cd/m$^2$ for red.

5.2 Dimming

The signs shall have dimming capability as per Clause 6.5 of AS2144:2014 [1].
For signs connected to traffic signal controllers, the sign shall be dimmable via connection to the traffic signal controller as per Clause 5.5.5 of AS2144:2014 [1].
For signs that do not connect to traffic signal controller, dimming shall be via photo-sensor.

6 MECHANICAL REQUIREMENT

6.1 Mounting

6.1.1 Mounting for No Left Turn R2-6L and No Right Turn R2-6R Signs

The signs shall be provided with all facilities to enable mounting of the finished sign using the same mounting centres as a 300mm traffic lantern, i.e. $1097 \pm 2$mm. The mounting arrangement shall be as per AS 2144 [1] clauses 4.1.2 and 4.1.4. RMS Engineering Drawing No. VM012-19 [11] shall be used as reference for the mounting on 300mm lantern centres.

6.1.2 Mounting for No Entry R2-4 Sign

The sign shall be provided with all facilities to enable mounting of the finished sign using the same mounting centres as a 200mm traffic lantern. i.e. $857 \pm 2$mm. The mounting arrangement shall be as per AS 2144 [1] clauses 4.1.2 and 4.1.4.
6.2 Access to Optical System

The signs shall comply with clause 4.1.3 of the AS2144:2014 [1]

6.3 Sealing of Optical System

Each optical system shall be preventing ingress of moisture, dirt and pollutants from all surfaces as required for the system to operate within accepted rates of deteriorations.

Where access to optical services located inside any chamber or behind a cover is required for programmed cleaning, suitable access for the necessary cleaning procedure shall be by means of hinged doors or removable covers, and shall not require the use of specialised tools to gain access.

Gaskets and seals, where used, shall be capable of being readily replaced without the need for removal of the Optical System from its mountings

6.4 Material and Method of Construction

The signs shall comply with clause 4.4 of AS2144:2014 [1]

6.5 Surface Finish

The signs shall comply with clause 4.5 of AS2144:2014 [1]. It shall be matt black.

6.6 Weather Resistance

The signs shall comply with clause 4.6 of AS2144:2014 [1]

6.7 Operation Temperature

The signs shall comply with clause 4.7 of AS2144:2014 [1]

7 ELECTRICAL REQUIREMENT

7.1 Compliance with AS/NZ 3100

The sign shall comply with AS/NZ 3100 [3].

7.2 Provision of Connection to Supply

The sign shall provide supply cabling as specified in clause 5.3 of AS2144:2014 [1], excluding reference to table 5.1. This cabling and its connection to the sign shall comply with AS3000 [2].

7.3 Activation Mode

The signs shall be activated via direct cable supply from an adjacent traffic signal controller and connected to the appropriate signal group.
7.4 Electromagnetic Compatibility

The equipment shall meet the Australian statutory electromagnetic compatibility requirements for EMC Emissions AS/NZS 61000.6.3 [5] and also the requirements for EMC Immunity AS/NZS 61000.6.1 [4].

8 OPTICAL SYSTEM COMPONENTS AND ANCILLARY DEVICES

8.1 Assembly of Optical System

The sign shall comply with clause 7.1 of the AS2144:2014 [1]

8.2 Properties of Optical Components

The sign shall comply with clause 7.2 of the AS2144:2014 [1]

8.3 LED Arrays

The sign shall comply with clause 7.3 of the AS2144:2014 [1]

8.4 Visors

Visors are required for the illuminated signs

9 QUALITY ASSURANCE AND CONTROL

9.1 General

The Supplier and the Manufacturer shall operate a quality management system complying with AS/NZS/ISO 9001 [6].

9.2 Third Party Certification

The Supplier and the Manufacturer shall have obtained third-party certification under AS/NZS/ISO 9001 [6] by an accredited independent organisation.

9.3 Quality Plan

The Manufacturer shall document a quality plan appropriate to the item detailing the quality control tests and assessments which 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.

9.4 Quality Audits

RMS reserves the right to examine the Supplier’s and Manufacturer’s quality records. RMS also reserves the right to arrange for an independent quality audit.

10 APPROVAL

To gain approval the Supplier shall follow the process defined in TS201 [7].
The Supplier shall submit the following documentation, as a minimum, in support of a submission for product approval via email to the ITS Help Desk:
(ITSHelpDesk@rms.nsw.gov.au).

   a) A clause-by-clause statement of compliance, and associated evidence, referenced to each compliance item, with this Specification and applicable clauses of referenced standards;

   b) Datasheet(s) of the equipment, which shall include parameters of physical characteristics;

   c) Design drawings of the complete product, which should show the general presentation and outline dimensions of the product, together with information of used material, protective treatments

   d) A copy of the Manufacturer’s quality plan for the equipment. Evidence of third party certification of the Supplier and Manufacturer’s quality systems;

   e) Any other documentation requested by RMS under the processes defined in TS201 [7]

   f) When a submission for acceptance is made, RMS may request a sample as part of the assessment

   g) A full list and description of all departures from the requirements of this Specification.