

Australian Standard™

Traffic signal mast arms

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Australian Electrical and Electronic Manufacturers Association
AUSTROADS
Brisbane City Council
Department of Transport, South Australia
Department of Urban Services, Australian Capital Territory
Metal Trades Industry Association of Australia
Roads and Traffic Authority of New South Wales
Traffic Control and Road Safety Industry Association
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Traffic signal mast arms

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PREFACE

This Standard was prepared by the Standards Australia Committee LG/6, Road Traffic Signals, to supersede AS 2979—1989. It is one of a number of Standards that set out requirements for the equipment associated with traffic signal installations. As at the date of publication of this Standard, these include the following:

AS

- 2144 Traffic signal lanterns
- 2276 Cables for traffic signal installations
 - 2276.1 Part 1: Multicore power cables
 - 2276.3 Part 3: Loop cable for vehicle detectors
- 2339 Traffic signal posts and attachments
- 2353 Pedestrian push-button assemblies
- 2578 Traffic signal controllers
 - 2578.1 Part 1: Physical and electrical compatibility
- 2703 Vehicle loop detector sensors
- 2979 Traffic signal mast arms (this Standard)
- 4113 Traffic signal lamps
 - 4113.1 Part 1: Lamps for 240 V a.c. operation
 - 4113.2 Part 2: Lamps for a.c. operation at extra-low voltage
- 4191 Portable traffic signal systems

AS/NZS

- 2276 Cables for traffic signal installations
 - 2276.2 Part 2: Feeder cable for vehicle detectors
- 4192 Illuminated flashing arrow signs

The objective of this Standard is to specify requirements for the design and construction of tubular steel mast arms used for the support of traffic signal lanterns and associated equipment above the roadway. It is intended for application by road and traffic authorities and their suppliers to facilitate the production, purchase and use of traffic signal mast arms.

This Standard applies to the following categories of traffic signal mast arms:

- (a) Those that are used principally for the support of traffic signal lanterns (known as mast arms).
- (b) Those that, as well as providing for the support of traffic signal lanterns, are used to support road lighting luminaires (known as joint-use mast arms).

Within each of these basic categories, this Standard designates a number of particular types of traffic signal mast arms, viz. Types 1, 2A, 2B, 3A, 3B and 3C, based on design and constructional considerations. The design and constructional differences that apply to the designated types are intended to provide for—

- (i) different installation practices, including the methods used for terminating traffic signal and public lighting cables; and
- (ii) different design wind velocities, to cater for conditions in various geographic regions.

Whilst road lighting poles of the slip-base and impact-absorbing type are available, no comparable designs exist for traffic signal mast arms because of the different performance requirements which apply, especially the significant torsional loads they must withstand.

Among the various changes that have been introduced in this edition, the following are of significance:

- (A) Changes to the form of designating mast arms and the introduction of new designated types (see Clause 1.5).
- (B) Changes necessitated by a revision of AS 1170.2*. In particular, the specification of design gust wind speed as the basis for structural strength requirements and serviceability wind speed as the basis for deflection requirements (see Clauses 2.2.1, 2.2.3 and 3.2.3).
- (C) Revision of the structural design requirements based on the ultimate limit state in accordance with AS 4100† (see Clause 2.2.1).
- (D) Alterations to the requirements for overhead lantern mounting assemblies and their attachment to the outreach arm (see Clause 2.3.3.1 and Figure 2.3).
- (E) Changes to requirements for lantern mounting lugs and associated fixings (see Figure 2.5).
- (F) Alterations to requirements controlling the overall dimensions of mast arms (see Figure 2.1).
- (G) For Type 1 mast arms and joint-use mast arms—
 - (1) the addition of new requirements for the entry of wiring from traffic signal lanterns mounted on the vertical section (see Clause 2.4.2 and Figure 2.10);
 - (2) revision of baseplate details (see Figure 2.6); and
 - (3) revision of door opening and cable termination facilities (see Figure 2.9).

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

* AS 1170 Minimum design loads on structures (known as the SAA Loading Code)

AS 1170.2 Part 2: Wind loads

† AS 4100 Steel structures

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STANDARDS AUSTRALIA

Australian Standard Traffic signal mast arms

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out requirements for traffic signal mast arms that are designed to support traffic signal lanterns and associated equipment above the roadway. It applies to—

- (a) traffic signal mast arms, as defined in Clause 1.4.8; and
- (b) joint-use mast arms, as defined in Clause 1.4.2.

The Standard does not specify details of shape or design except insofar as these matters are controlled by the specified requirements.

The Standard does not apply to traffic signal posts (see AS 2339), nor to the installation of mast arms and their foundations.

NOTE: See Appendix A for the information which should be supplied with an enquiry or order for mast arms complying with this Standard.

1.2 OBJECTIVES The objectives of the Standard are to—

- (a) ensure that mast arms will present a reasonably uniform appearance to road users;
- (b) provide for rationalization in the range of sizes required and in the functional performance requirements; and
- (c) provide for uniformity in the fixings and attachments used.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- 1170 Minimum design loads on structures (known as the SAA Loading Code)
- 1170.1 Part 1: Dead and live loads and load combinations
- 1170.2 Part 2: Wind loads
- 1214 Hot-dip galvanized coatings on threaded fasteners
- 1650 Hot-dipped galvanized coatings on ferrous articles
- 1798 Lighting poles and bracket arms—Preferred dimensions
- 2144 Traffic signal lanterns
- 2339 Traffic signal posts and attachments
- 2353 Pedestrian push-button assemblies
- 2837 Wrought alloy steels—Stainless steel bars and semi-finished products
- 3000 Electrical installations—Buildings, structures and premises (known as the SAA Wiring Rules)
- 4100 Steel structures

1.4 DEFINITIONS For the purpose of this Standard, the definitions given in AS 1798, AS 2144 and those below apply.

1.4.1 Column lantern fixings—mounting lugs provided on the vertical section of a traffic signal mast arm, which are designed for the support of traffic signal lanterns.

1.4.2 Joint-use mast arm—a traffic signal mast arm that incorporates a lighting outreach assembly for the support of a road lighting luminaire(s). It combines the functions of a traffic signal mast arm and a lighting pole.

1.4.3 Mast-arm projection—the horizontal distance between a vertical line through the centre of the baseplate and the outreach reference point.

NOTE: See AS 1798 for the definition of ‘arm projection’ for a lighting pole.

1.4.4 Nominal height—the vertical distance between the bottom of the baseplate and the outreach reference point.

NOTE: See AS 1798 for the definition of ‘nominal height’ for a lighting pole.

1.4.5 Outreach reference point—the intersection of the centre-line of the outreach arm and the face of the overhead lantern mounting assembly which attaches to the outreach arm.

1.4.6 Overhead lantern fixings—mounting lugs provided on the overhead lantern mounting assembly, which are designed for the support of traffic signal lanterns.

1.4.7 Overhead lantern mounting assembly—a member, attached at the extremity of the outreach arm, which is designed for the mounting of traffic signal lanterns.

1.4.8 Traffic signal mast arm—a freestanding structure comprising a vertical section and outreach arm used for the support of traffic signal lanterns and associated equipment.

NOTE: Throughout this Standard traffic signal mast arms are referred to as ‘mast arms’.

1.5 TYPE DESIGNATIONS For the purpose of this Standard, mast arms and joint-use mast arms shall be designated in accordance with the following:

- (a) *Type 1* Type 1 mast arms and Type 1 joint-use mast arms shall—
 - (i) be designed on the basis of wind loadings applicable to Region A in AS 1170.2;
 - (ii) provide for mounting on a baseplate using four bolts equally spaced on a pitch circle diameter of 350 mm; and
 - (iii) incorporate facilities for terminating traffic signal cables inside the lower part of the vertical section.
- (b) *Type 2A* Type 2A mast arms and Type 2A joint-use mast arms shall—
 - (i) be designed on the basis of wind loadings applicable to Region A in AS 1170.2;
 - (ii) provide for mounting on a baseplate using four bolts equally spaced on a pitch circle diameter of 500 mm; and
 - (iii) incorporate facilities for terminating traffic signal cables in an elevated, externally mounted junction box.
- (c) *Type 2B* Type 2B mast arms and Type 2B joint-use mast arms shall be designed on the same basis as for Type 2A but with wind loadings applicable to Region B in AS 1170.2.
- (d) *Type 3A* Type 3A mast arms and Type 3A joint-use mast arms shall—
 - (i) be designed on the basis of wind loadings applicable to Region A in AS 1170.2;
 - (ii) provide for mounting on a baseplate using eight bolts equally spaced on a pitch circle diameter of 380 mm; and
 - (iii) incorporate facilities for terminating traffic signal cables in an elevated, externally mounted junction box.

- (e) *Type 3B* Type 3B mast arms and Type 3B joint-use mast arms shall be designed on the same basis as for Type 3A but with wind loadings applicable to Region B in AS 1170.2.
- (f) *Type 3C* Type 3C mast arms and Type 3C joint-use mast arms shall be designed on the same basis as for Type 3A but with wind loadings applicable to Region C in AS 1170.2.

NOTES:

- 1 See Clause 2.3.5 for details of baseplate mounting requirements.
- 2 See Clause 2.4 for the facilities which should be provided for the termination of traffic signal cables.