

Australian/New Zealand Standard<sup>®</sup>

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## Road Lighting

**Part 1.1: Vehicular traffic  
(Category V) lighting—Performance  
and installation design requirements**

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## AS/NZS 1158.1.1:1997

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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee LG/2, Road Lighting. It was approved on behalf of the Council of Standards Australia on 27 September 1996 and on behalf of the Council of Standards New Zealand on 19 August 1996. It was published on 5 April 1997.

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The following interests are represented on Committee LG/2:

Australian Electrical and Electronic Manufacturers Association  
AUSTROADS  
Electricity Supply Association of Australia  
Illuminating Engineering Society of Australia and New Zealand  
Institute of Municipal Engineering Australia  
Land Transport Safety Authority, New Zealand  
Metal Trades Industry Association of Australia  
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## Road Lighting

### Part 1.1: Vehicular traffic (Category V) lighting—Performance and installation design requirements

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Originated in Australia as part of AS CA19—1939.  
Originated in New Zealand in part as NZCP 54:1962.  
Final Australian edition part of AS 1158.1—1986.  
Final New Zealand edition part of NZS 6701:1983.  
AS 1158.1—1986 and NZS 6701:1983 jointly revised  
and redesignated in part as AS/NZS 1158.1.1:1997.

Incorporating:  
Amdt 1—1998

PUBLISHED JOINTLY BY:

STANDARDS AUSTRALIA  
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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee LG/2, Road Lighting, to supersede (in part) AS 1158.1—1986, *The lighting of urban roads and other public thoroughfares* (known as the *SAA Public Lighting Code*), Part 1: *Performance and installation requirements*, and (in part) NZS 6701:1983, *Code of practice for road lighting*.

This Standard forms Part 1.1 of a new series, the AS/NZS 1158 series, which will collectively cover lighting for the generality of roads and outdoor public areas, for the movement of vehicles and pedestrians. The AS/NZS 1158 series will progressively replace Standards existing in the AS 1158 series, and NZS 6701.

For the application of Standards in the AS/NZS 1158 series, a number of lighting categories are defined in AS/NZS 1158.0 which may be broadly described as follows:

- (a) *Category V lighting* Lighting which is applicable to roads on which the visual requirements of motorists are dominant, e.g. traffic routes.
- (b) *Category B lighting* Lighting which is applicable to roads on which the visual requirements of pedestrians are dominant, e.g. local roads.
- (c) *Category C lighting* Lighting which is applicable to outdoor public areas, other than roads, where the visual requirements of pedestrians are dominant, e.g. outdoor shopping precincts.

This Standard sets out performance and installation design requirements for Category V lighting. The objective of these requirements is to provide visual conditions which are conducive to the safe and comfortable movement of vehicular and pedestrian traffic at night, and the discouragement of illegal acts.

As at the date of publication of this Standard, the following Standards have been issued in the AS/NZS 1158 series:

### AS/NZS

1158	Road lighting
1158.0	Part 0: Introduction
1158.1.1	Part 1.1: Vehicular traffic (Category V) lighting—Performance and installation design requirements (this Standard)
1158.1.3	Part 1.3: Vehicular traffic (Category V) lighting—Guide to design, installation, operation and maintenance

Requirements for the lighting of minor roads (i.e. Category B lighting) and for the lighting of outdoor public areas for pedestrian movement (i.e. Category C lighting) have yet to be issued within the AS/NZS 1158 series. Until that time, the relevant requirements of AS 1158.1—1986 or NZS 6701:1983 will continue to apply.

This joint Standard is intended to be applied in its entirety in Australia and New Zealand; however, several differences exist with respect to the requirements that apply in each country. These are indicated by the qualification 'In Australia' or 'In New Zealand', or similar. The issues involved are to be the subject of further study during the life of this Standard with a view to the specification of common requirements in the next edition.

The requirements of this Standard are not fundamentally different from those of the Standards which, in part, it supersedes. The main changes that have been introduced are summarized below in terms of their implications to Australian and New Zealand designers.

**For Australian designers:**

- (i) Elimination of the discomfort glare control mark ( $G$ ) as a light technical parameter. This parameter was previously in AS 1158.1—1986 but was not specified in NZS 6701:1983.
- (ii) The value of threshold increment ( $TI$ ) previously in AS 1158.1—1986 (i.e. 25%) has been reduced to 20% which aligns with that in NZS 6701:1983.
- (iii) The addition of requirements for the lighting of isolated intersections and junctions.

**For New Zealand designers:**

- (A) Addition of the parameter  $E_s$  to control the reduction in illuminance on surfaces (e.g. the verge) immediately adjacent to the carriageway.
- (B) Luminaire spacings are defined differently which, for staggered lighting arrangements, has the effect that the spacings determined will be half those which would apply for the same installation in terms of NZS 6701:1983.
- (C) Many additional design rules are given, particularly for locations where significant changes or discontinuities occur, e.g. complex intersections.

**For Australian and New Zealand designers:**

- (1) Redesignation of existing lighting/road categories and the addition of several new lighting categories, compared with those which previously applied in AS 1158.1—1986 and NZS 6701:1983.
- (2) Addition of the parameter  $U_v$  to control the variation in illuminance for road elements for which an illuminance-based design is specified.
- (3) Addition of the parameter  $UWLR$  to control the emission of light above a horizontal plane through the luminaires.
- (4) Provision for a trade-off between the average carriageway luminance ( $\bar{L}$ ) and the overall luminance uniformity ( $U_o$ ) under specified conditions.
- (5) Different values are specified for the parameter  $U_L$  arising from different observer positions assumed for calculations in Australia and New Zealand.
- (6) Computer-based calculation procedures are generally specified as the sole means of demonstrating compliance with the applicable light technical parameters; however, luminaire spacing tables, luminaire performance tables and isolux diagrams may be used, as appropriate, as preliminary installation design aids.
- (7) Normally, unless otherwise specified by the client, luminance-based light technical parameters are required to be calculated using the following standard road surfaces:
  - For Australia, the CIE R3 road surface.
  - For New Zealand, both NZR2 and NZN4 road surfaces.

Road lighting is acknowledged to be an effective accident counter-measure. The costs involved in providing road lighting can be demonstrated to provide significant financial and community benefits in terms of reductions in road accidents at night. Studies in Australia and New Zealand, and in other countries, have led to the conclusion that traffic route lighting is likely to reduce night time casualty accidents by about 30%, taken over the road network. See References 4 and 12 in Appendix A. Further information is given in AS/NZS 1158.1.3\*.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

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\* AS/NZS 1158.1.3 Road lighting—Part 1.3: Vehicular traffic (Category V) lighting—Guide to design, installation, operation and maintenance

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# STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

## Australian/New Zealand Standard

### Road lighting

#### Part 1.1: Vehicular traffic (Category V) lighting— Performance and installation design requirements

## SECTION 1 SCOPE AND GENERAL

**1.1 SCOPE** This Standard specifies performance and installation design requirements for Category V lighting as described in AS/NZS 1158.0. It also specifies the luminaire and installation design data that is needed to facilitate the lighting design and the assessment of compliance with the requirements of this Standard.

This Standard is intended to be read in conjunction with AS 1158.2, AS/NZS 1158.0, AS/NZS 1158.1.3 and NZS 6701.

#### NOTES:

- 1 Category V lighting is applicable to roads on which the visual requirements of motorists are dominant, e.g. arterial roads.
- 2 Computer-based calculation procedures applicable to the design of Category V lighting are given in AS 1158.2 except that, for application in New Zealand, the observer position for the calculations is taken as specified in NZS 6701. Guidance on the design, installation, operation and maintenance of Category V lighting is provided in AS/NZS 1158.1.3.

**1.2 REFERENCED DOCUMENTS** A list of the Standards and other documents referred to in this Standard is given in Appendix A. The Appendix also lists a number of additional documents which are considered useful sources of information on the subject of this Standard.

**1.3 DEFINITIONS** For the purpose of this Standard, the definitions given in AS/NZS 1158.0 apply.

**1.4 SYMBOLS AND ABBREVIATIONS** For the purpose of this Standard, the symbols and abbreviations given in AS/NZS 1158.0 apply.

**1.5 LIGHTING CATEGORIES AND THEIR APPLICATION** For the purpose of this Standard, the lighting categories set out in Table 1.1 shall apply. Table 1.1 also describes typical applications for each of the lighting categories given.

The appropriate lighting category for a particular road should be a matter for determination in consultation with the road or traffic authority concerned.

NOTE: The lighting categories and typical applications given in Table 1.1 are identical to those incorporated in the broader categorization of lighting in AS/NZS 1158.0. The categories applicable to traffic routes differ from those in AS 1158.1—1986 and NZS 6701:1983. See Appendix B for information on the general relationship of the new lighting categories to those which previously applied.



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