

AS/NZS 1158.5:2007
(Incorporating Amendment No. 1)

AS/NZS 1158.5:2007

Australian/New Zealand Standard™

Lighting for roads and public spaces

Part 5: Tunnels and underpasses



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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee LG-002, Lighting for Roads and Public Spaces. It was approved on behalf of the Council of Standards Australia on 23 July 2007 and on behalf of the Council of Standards New Zealand on 10 August 2007. This Standard was published on 31 August 2007.

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Australian Electrical and Electronic Manufacturers Association
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Energy Networks Association
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee LG-002, Lighting for Roads and Public Spaces, to provide performance and design requirements for lighting schemes for tunnels and underpasses.

This Standard incorporates Amendment No. 1 (March 2011). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

Tunnels and underpasses, including underbridges, are road elements where simple accidents can have a serious effect on the smooth operation of the associated road network. Lighting design for these elements is essentially to overcome the daylight problems of the 'black hole' seen on the approach to a tunnel portal on the one hand and on the other, shadowing of objects within an underpass. These potential effects result from the, often, high light adaptation of the motorist's vision and then may only be overcome by the application of very high levels of lighting in the relevant zones of the structures.

Since the structures in question are mainly located on heavily trafficked urban roads, the specific lighting subcategories are based on the structural design details, i.e. length for tunnels and the degree of 'see-through' for underpasses, and not on traffic characteristics.

This Standard is for the use of designers, consultants, owners and operators of lighting schemes for tunnels and underpasses. However the design of tunnel lighting schemes is complex and involves the use of specialist computer software and should be undertaken only by experienced designers.

The design of lighting schemes for tunnels is based largely on CIE 88 and on considerable national experience. However the method of determining the light adaptation level of the motorist approaching the tunnel portal (L_{20}) is retained from the 1st edition (1990) rather than the method of the 2nd edition (2004). This is because the given method is complex and untried—the more simple method of the 1st edition has given very satisfactory results in practice.

The day lighting for much of the tunnel is predicated on the L_{20} value in the particular situation. Therefore the luminances of the various elements, in particular that of the sky, making up the relevant field of view of the motorist must be known with accuracy. The Standard contains indicative values based on a program of sky measurements and more abbreviated measurements of other structural elements, taken in Australia and those in CIE 88.

The design of lighting schemes for underpasses is based on BS 5489-2 (2003) and the method of determining the degree of 'see-through' on considerable national experience.

The compliance values of the light technical parameters are the minimum to be maintained through the life of the installation; an effective maintenance regime for the lighting scheme is essential, particularly in the case of tunnels. The values given are the minimum necessary to ensure sufficient safety and comfort.

The light technical parameters for the various zones in the structures are based, in general, on the following:

- (a) The luminance level of the road and walls.
- (b) The uniformity of luminance of the road and walls.
- (c) Limitation of glare from the luminaires.
- (d) Limitation of the flicker effect from luminaires.

Other requirements, such as luminaire IP ratings and maximum acceptable maintenance factor (MF) need to be considered.

Information is given on how motorist's perceptions are influenced by tunnel design and operation, on mains failure lighting, tunnel signage, tunnel lighting maintenance and on the design brief and compliance documentation.

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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