AS/NZS 4282:2019

Australian/New Zealand Standard™

Control of the obtrusive effects of outdoor lighting

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The following are represented on Committee LG-010:

Astronomical Society of Australia
Auckland Transport
Brisbane City Council
CIE Australia
Consumers Federation of Australia
Energy Networks Association
Engineers Australia
IES: The Lighting Society
IES: The Lighting Society New Zealand
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Australian/New Zealand Standard™

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PREFACE

This Standard was prepared by the Joint Standards Australia/New Zealand Committee LG-010, Obtrusive Effects of Outdoor Lighting, to supersede AS 4282—1997.

The objective of this Standard is to provide a common basis for assessment of the likely effects of developments that involve the provision of outdoor lighting. However, it should be noted that the potentially obtrusive effects of the lighting will normally be only one of a number of environmental and ecological considerations that will need to be addressed. Conformance to this Standard, i.e. to the limits for the various light technical parameters, will therefore not usually be the sole basis for the approval of particular development proposals.

The following are significant changes between this edition and the previous edition:

(a) The 1997 edition is a guidance document while this edition specifies requirements.

(b) The effect of lighting of vertical planes including internally and externally illuminated signs, façades or objects has been included. The Standard is not intended to specify signage but only addresses the obtrusive impact of these lit surfaces.

(c) The classification of environmental areas has been expanded to include environmentally sensitive areas and better align the categories to international standards.

(d) The position of the calculation planes have been changed to better define the difference between current and future dwelling locations and also provide a buffer zone for lighting at the property boundary.

(e) In general, this Standard does not apply to public lighting. However, limits have been included in this edition that can be applied when specified by the relevant authority. This was done so that obtrusive light can be controlled in areas where it may be seen as a problem without the need to calculate the impact of every streetlight.

(f) This Standard now applies to broadcast television lighting and limits have been included.

Formally recognized sensitive locations, such as Siding Spring Observatory (Australia) and Aoraki Mackenzie International Dark Sky Reserve (New Zealand) may have requirements in addition to this Standard. This Standard does not address all the requirements that may be necessary for the lighting system to facilitate specific activities for which it is designed. Reference should be made to the appropriate Standard, such as the AS 2560 series for sports lighting, AS/NZS 1680.5 for outdoor workplaces and the AS/NZS 1158 series for the lighting for roads and public spaces.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

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.

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FOREWORD

With any outdoor lighting it will rarely be possible to contain all light within the boundaries of the property on which the lighting system is installed. Some light will inevitably be spilled outside the property boundaries, either directly or by reflection. The determination of when the spill light becomes obtrusive to others is difficult since both physiological and psychological effects are involved.

Local government plays an important role in controlling the obtrusive effects of outdoor lighting through the approvals process, and in resolving neighbourhood disputes involving residents who experience discomfort or annoyance from nearby outdoor lighting installations. Some local government authorities have applied restrictions on the frequency of use and hours of operation of outdoor lighting, and on the levels of light spilled beyond the boundaries of the subject site.

The requirements and recommendations of this Standard are based on surveys of interested parties, i.e. local government, electricity utilities and the lighting industry; on studies of people's reaction to obtrusive light; on the extent of spill light from lighting installations; and on precedents for the regulatory control of obtrusive light.

Several aspects of potential obtrusiveness are considered, viz. light falling on surrounding properties, the brightness of luminaires in the field of view of nearby residents, glare to users of adjacent transport systems, the effects on astronomical observations (see Clause 2.4.4) and the impact on protected dark environments. For the control of these effects, the limiting values of the light technical parameters specified in Tables 3.2 to 3.5 have been developed taking account of the following:

(a) The level of lighting existing in the area.

(b) The times that the proposed lighting is to operate.

(c) The type of lighting technology available to light the task.

(d) The use of readily available and easily understood technical data on the lighting installations that can easily be verified at the design and assessment stages.

These criteria have been employed to ensure that this Standard is both credible to the interested parties and pragmatic in application.

Research indicates that the limiting values of illuminance at windows and of the intensity of bright light sources, necessary to satisfy the large majority of people as being at all times unobtrusive, are rather low. Furthermore, these values can easily be exceeded with conventional lighting practice, especially if the area of activity being lit is large and the required light level is relatively high. Thus, the potentially conflicting requirements for dark-hours activity and the maintenance of amenity and environmental integrity have to be resolved.

Therefore, two sets of limiting values are given dependent on the levels of lighting already in the area. One, with higher values, is for application outside the curfew period set by local government and the other, with lower values, is for application during the curfew period. The majority of outdoor sports lighting systems likely to be subject to this Standard are expected to operate only outside the curfew period.

The less restrictive values are predicated on dark time activity taking place whilst giving passive recipients of spill light relief from it being excessively obtrusive. The limiting values are based on the use of conventional lighting technology but with good practice being employed through the selection of appropriate lighting levels, luminaires and aiming practices.

The more restrictive values, applying during the curfew period, are predicated on the maintenance of amenity and environmental integrity being the dominant considerations. The spill light at these times should be such that it will not be obtrusive to the large majority of recipients. To achieve this goal the need for the proposed lighting and its operation during the curfew period should be considered in the first instance. If the lighting is to operate during the curfew period then careful attention needs to be given to the limitation of spill light, including consideration of the type of lighting system to be used, the type of luminaires (i.e. light distribution) and their specific location and aiming, and the need for the fitting of louvres, baffles or shields.

Public lighting is not within the scope of this Standard. However, light technical parameter limits have been included where the relevant authority considers that obtrusive light should be considered. The limits recognize that such lighting is provided to facilitate safety and security for the public at large. Such lighting is normally supplied from the switched public lighting network. For traffic routes, AS/NZS 1158 series, *Lighting for roads and public spaces*, limit the upward waste light ratio (*UWLR*) as a parameter to control the amount of light emitted in directions above the luminaires.

Lighting for aviation safety does not fall within the scope of this Standard.

Visual intrusion caused by the daytime appearance of outdoor lighting systems, including associated support structures, is not addressed in this Standard. Whilst the subject is important, the issues involved are of more general application involving aesthetics and environmental design.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

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S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE

This Standard sets out requirements for the control of the obtrusive effects of outdoor lighting. It includes limits for the relevant light technical parameters to control these effects. As the obtrusive effects of outdoor lighting are best controlled by appropriate design, this Standard is primarily applicable to new installations. This Standard specifically refers to the potentially adverse effects of outdoor lighting on nearby residents (e.g. of dwellings such as houses, hotels, hospitals), users of adjacent roads (e.g. vehicle drivers, pedestrians, cyclists) and transport signalling systems (e.g. air, marine, rail), and on astronomical observations.

NOTE: Appendix B provides guidance on the documentation that may be required by planning bodies, in order to facilitate assessment of a proposed lighting scheme.

The Standard does not apply to public lighting, as defined in Clause 1.4.11, unless specified by the relevant authority.

This Standard does not apply to environmental impacts associated with the daytime appearance of outdoor lighting systems, including their support structures.

Due to the diversity of biota throughout Australia and New Zealand and minimal information on thresholds and behavioural response of species to artificial light, the effect of obtrusive light on fauna is not covered within the normative parts of this Standard.

NOTE: This subject is discussed in Appendix C for information only.

1.2 APPLICATION

This Standard is intended for reference by the following:

(a) Planning bodies, particularly local government and road controlling authorities, to assist in assessing the potential obtrusiveness of outdoor lighting installations.

(b) Designers of outdoor lighting, as an aid to producing lighting systems that control obtrusive effects to an acceptable degree.

For the purpose of applying the light technical parameters (LTPs) a lighting installation shall be counted as a stand-alone installation; however, it shall include the impact from existing installations on the same property. Where there are lighting installations on several properties their impact shall be assessed independently of each other. The impact of public lighting shall be assessed independently of other lighting impacts.

Where any doubt exists on the potential effects of a specific proposal, appropriate persons with competence in the fields of illuminating engineering and environmental design should be consulted. This applies particularly to installations that are large in extent or that are otherwise of a nature that may require a formal environmental impact approval.