

Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations

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Abstract. Division 5 of the CIE deals with the subject of “Exterior and other Lighting Applications” and has since 1991 had a Technical Committee (TC5.12) working on a “Guide on the limitation of the effects of obtrusive light from outdoor lighting installations”. This Committee did much of its work under the chairmanship of Dr. Alec Fisher of Australia, who has now retired and passed on the work to the current author. The present report outlines the content of the proposed Guide and details its relevance to help preserve the astronomical sky. It also highlights the close links with CIE Committee TC4.21, which works directly on the problems of sky glow.

1. Contents of the Guide

The document is currently in draft form, and it is hoped to publish it in 2000. It has the following contents list:

1. Scope
2. Potential Obtrusive Effects and Associated Light Technical Parameters
3. Design, Installation, Operation and Maintenance
4. Documentation of Lighting Design
5. Calculation of Light Technical Parameters
6. Measurement of Light Technical Parameters

Appendices:

- A. Investigations into the Obtrusive Effects of Outdoor Lighting
- B. Illustration of Floodlight Classifications.

The document is concerned with a wide range of observers as identified in the following list, taken from Section 2.6 of the document:

2.6	<u>Specific Effects and Relevant Light Technical Parameters</u>
2.6.1	Residents
2.6.3	Transport signalling systems
2.6.2	Transport system users
2.6.4	Sightseers
2.6.5	Astronomical observations

This leads into the design objectives for which a check list is given in Figure 3.1 of the Guide, “Checks of Potential Obtrusiveness which should be Undertaken in the Design of Outdoor Lighting”. The check list includes the following actions to be taken concerning potential obtrusive effects of a lighting installation on astronomical observations:

- Check effects on astronomical observations
- Identify locations of community or scientific optical observatories
- Check existence of planning regulations related to observations
- Check that the illuminances proposed are not excessive in relation to those recommended for the activity
- Assess installation for compliance with recommended limits of *UWLR* in CIE Publication 126

Further design help is given in Table 3.1 of the Guide, which gives the possible effects on spill light from changes to the installation parameters.

All the above are brought together in Section 3.3 of the document, Design Guidelines, which also suggests a definition of three luminaire types as below:

Type A Symmetrical

Type B Asymmetrical

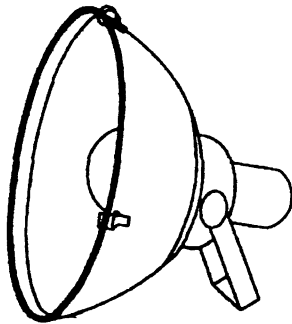
Type C Double-Asymmetrical

These three types of floodlight luminaires and their illumination patterns are illustrated in Figures 1 and 2 of the present paper. The CIE Document then goes into more details on calculation and measurement methods.

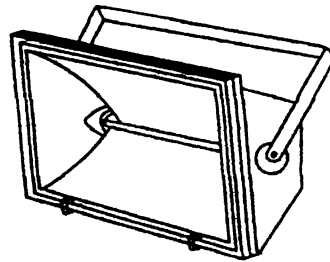
Copies of the 4th Draft of the document are available from the present author, who is the Committee Chair. The document will be published on the CIE website

www.cie.co.at/cie

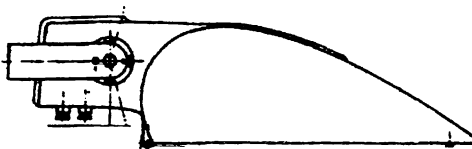
in due course.



(a) Type A floodlight giving a symmetrical beam

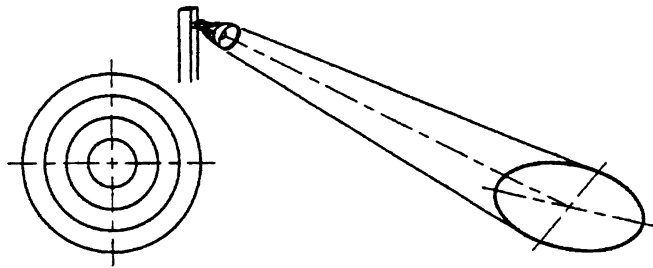


(b) Type B floodlight giving a fan-shaped beam

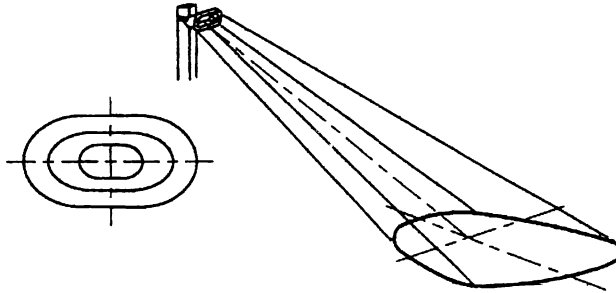


(c) Type C floodlight giving a fan-shaped beam with asymmetric distribution in the vertical plane

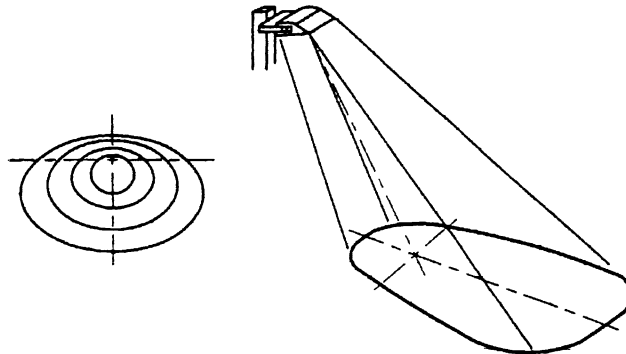
Figure 1. General types of Floodlight Luminaires. From Section 5 of the CIE “Guide on the limitation of the effects of obtrusive light from outdoor lighting installations”.



(a) Typical beam cross-section and light pattern produced on a horizontal surface by a Type A floodlight



(b) Typical beam cross-section and light pattern produced on a horizontal surface by a Type B floodlight



(c) Typical beam cross-section and light pattern produced on a horizontal surface by a Type C floodlight

Figure 2. Typical floodlight distributions shown diagrammatically. From Section 5 of the CIE “Guide on the limitation of the effects of obtrusive light from outdoor lighting installations”.