

Road lighting

Part 3. Code of practice for lighting for subsidiary roads and associated pedestrian areas

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Committees responsible for this British Standard

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- Automobile Association
- British Lighting Association for the Preparation of Standards (Britlaps)
- British Precast Concrete Federation Ltd.
- Chartered Institution of Building Services Engineers
- Council for the Protection of Rural England
- County Surveyors' Society
- Department of Transport
- Institution of Civil Engineering Surveyors
- Institution of Civil Engineers
- Institution of Electrical Engineers
- Institution of Lighting Engineers
- Institution of Mechanical Engineers
- Lighting Industry Federation Ltd.
- Royal Fine Art Commission
- Scottish Office (Building Directorate)

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Foreword

This Part of BS 5489 has been prepared under the direction of the Electrical Illumination Standards Policy Committee and is a new edition of BS 5489 : Part 3 : 1989 which is withdrawn.

In the 1989 edition average and minimum levels of illuminance are recommended to meet the needs of both pedestrians and drivers of vehicles. Emphasis was given to the importance of good lighting as a crime deterrent. General concepts are discussed in BS 5489 : Part 1, the reading of which is essential for the understanding of this Part 3.

This edition introduces a revised definition of maintenance factor and incorporates editorial improvements but it does not reflect a full review or revision of the standard, which will be undertaken in due course.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Code of practice

1 Scope

This Part of BS 5489 gives recommendations for the lighting of subsidiary roads, namely access roads, residential roads, and associated pedestrian areas. It does not cover the lighting of urban centres and other public amenity areas, which are covered in Part 9. Primary, district, and local distributor roads, which were formerly classified as group B8 roads, are now classified as traffic routes and are covered in Part 2 of this code.

A step by step illustration of the use of this code is given in appendix A.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 5489 the definitions given in BS 6100 : Subsection 2.4.1, BS 5225 : Part 1 and BS 5489 : Part 1 apply, together with the following.

2.1 access road

A road that provides access from local distributor roads to residential, business or industrial areas with light traffic.

2.2 footpath

A means of passage for pedestrians. Footpaths may be across open spaces, or between buildings.

2.3 footway

The portion of a road that is reserved for pedestrians.

2.4 residential road

A road that carries little vehicular traffic other than that generated by the residents.

2.5 shared surface

A surface used in common by vehicles and pedestrians, typically occurring in compact housing layouts.

2.6 utilization factor (of a surface)

The fraction of the total lamp flux of an installation that is received by the surface.

3 General design recommendations

3.1 General

The main purpose of lighting for the areas covered by this Part of BS 5489 is to enable pedestrians to orientate themselves and detect vehicular and other hazards, and to discourage crime directed against the person and property. The lighting on roads should provide guidance for motorists, but may be insufficient for revealing objects on the road without the use of headlights.

Luminaires may, with advantage, emit light into front gardens and on to the faces of houses and buildings where these are reasonably close to the footpath. This will enhance the appearance of the area, and assist in the protection of property.

3.2 Crime and pedestrian safety

In areas where there is a high crime risk care should be taken that any potentially dark areas, which may provide cover for a criminal, are lighted. Also consideration should be given to using more than one lighting unit at specific high risk locations so that a single lamp failure does not leave an area in total darkness. Colour rendering is a help in crime detection and this should be taken into account in choosing a light source (see 4.1). The operation of the lighting throughout the hours of darkness is strongly recommended (see clause 6).

To provide a sense of security it should be possible to recognize, in time to make an appropriate response, whether another person is likely to be friendly, indifferent or aggressive. To ensure a high possibility of recognition the illuminance on vertical surfaces at the average height of the human face should be adequate. In those situations within the scope of this Part of BS 5489, this condition will generally be satisfied by fulfilling the lighting requirements for maintained horizontal illuminance given in 3.3 for category 3/1 and 3/2 roads. For category 3/3 roads the crime risk is very low and this requirement is less critical.

NOTE. The quantification of light on vertical planes presents a difficulty because of the multiplicity of planes at each measurement point which have to be taken into account. This is, to some extent, overcome by using the average illuminance on an infinitesimal vertical half cylinder situated at average head height (1.5 m). But even with this measure, the semi-cylindrical illuminance, it is necessary to take into account at least three orientations of the half cylinder (the curved surface facing up, down, and across the road). In addition, no simple method has yet been evolved of calculating semi-cylindrical illuminance from a complete installation other than by using a computer.

3.3 Lighting requirements

The lighting requirements for subsidiary roads and associated areas are classified according to the public use, the crime risk, and the traffic use as follows.

a) Category 3/1

Roads where night-time public use is likely to be high (this may be associated with amenities such as clubs, shopping facilities, public houses, old people’s homes etc.);
or the crime risk is likely to be high;
or traffic usage is likely to be high.

b) Category 3/2

Roads that do not fall into category 3/1 and where night-time public use is likely to be moderate (this may also be associated with amenities such as clubs, shopping facilities, public houses, old people’s homes, etc.);
or the crime risk is average to low;
or traffic usage is of a level equivalent to that of a housing estate access road.

c) Category 3/3

Roads where night-time public use is minor and solely associated with the adjacent properties;
and the crime risk is very low;
and traffic usage is of a level equivalent to that of a residential road.

NOTE. Assistance in deciding on the crime risk, i.e. high, moderate, or low, should be obtained from the local crime prevention officer.

Table 1. Lighting requirements for subsidiary roads and associated pedestrian areas		
Category of road or area	Requirements for road, verge, and footway or footpath	
	Maintained average illuminance lx	Maintained minimum point illuminance lx
3/1	10.0	5.0
3/2	6.0	2.5
3/3	3.5	1.0

The lighting requirements for these three categories are given in table 1. In a street these apply to the road, the footways, and any intermediate verges. For a shared surface they apply to the road and any other adjoining area frequented by the public. They also apply to footpaths.

4 Lighting design

4.1 Preferred light sources

The preferred light sources are low pressure sodium and high pressure sodium lamps on grounds of efficacy and life. The low pressure sodium lamp has the greater efficacy but emits a monochromatic light which does not render colours other than yellow. The high pressure sodium lamp has a longer life and renders colours throughout the spectrum, making it particularly suitable for those areas where pedestrian activities predominate or where the crime risk has to be taken into consideration, or areas that are environmentally sensitive.

The use of other light sources may be considered for special applications.

4.2 Glare control of luminaires

The presence of glare will cause disability and discomfort, and it is important that this be restricted in the lighting of roads. In other areas such as shared surfaces the lighting may have an ornamental aspect and what is normally regarded as glare can sometimes be accepted as sparkle. In these circumstances it would be inappropriate to apply a conventional glare restriction to the luminaire; its suitability needs to be judged by the lighting designer on a subjective basis.

To provide adequate glare control, luminaires used for lighting roads and emitting 3.5 klm or more in the lower hemisphere based on the initial luminous flux of the lamp should have intensities at 80° and 90° to the downward vertical which are less than 160 cd/klm and 80 cd/klm respectively, at any angle of azimuth.

There are no intensity restrictions for luminaires emitting less than 3.5 klm in the lower hemisphere.

NOTE. The restriction of controlling the intensities at 80° and 90° at all angles of azimuth has been introduced to ensure adequate glare control on bends, junctions and shared surfaces.

4.3 Luminaire arrangement

A staggered arrangement of luminaires as shown in figure 2 of BS 5489 : Part 2 : 1992 is to be preferred for the lighting of roads with a footway on either side, but a single side arrangement may be used provided that the lighting criteria are met.

4.4 Mounting height

The preferred mounting heights of luminaires are 4 m, 5 m and 6 m. In making a choice consideration should be given to daytime appearance, guidance on which is given in 5.2 of BS 5489 : Part 1 : 1992.