

Emergency lighting —

Part 1: Code of practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment

ICS 91.160.10

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- Association of British Theatre Technicians
- Association of Building Engineers
- Association of County Councils
- Association of Manufacturers of Power Generating Systems
- British Cable Makers Confederation
- British Fire Consortium
- Chartered Institution of Building Services Engineers
- Chief and Assistant Chief Fire Officers' Association
- Cinema Exhibitors' Association
- Department of the Environment, Transport and the Regions
- Department of Trade and Industry
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- London Transport
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- National Illumination Committee of Great Britain
- National Inspection Council for Electrical Installation Contracting
- Photoluminescent Safety Products Association
- Tenpin Bowling Proprietors' Association
- Co-opted members

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 Consultation and records	2
4 Need for emergency lighting	3
5 Illumination for safe movement	3
6 Emergency lighting design	4
7 Batteries	7
8 Wiring systems and circuit requirements	7
9 Choice of appropriate emergency lighting systems	10
10 Emergency lighting design procedure	12
11 Certificate and log book	13
12 Servicing	14
Annex A Measuring illuminance of emergency lighting	17
Annex B Model completion certificate	18
Annex C Model periodic inspection and test certificate	21
Annex D Model servicing schedule	24
Publications referred to	Inside back cover

Foreword

This part of BS 5266 has been prepared by Technical Committee CPL/34/9. Together with BS EN 1838, it supersedes BS 5266-1:1988, which is withdrawn. This new edition of BS 5266-1 has been produced to take into account the requirements of, and remove any requirements which conflict with, BS EN 1838. The other parts of this standard are:

- Part 2: *Code of practice for electrical low mounted way guidance systems for emergency use*;
- Part 3: *Specification for small power relays (electromagnetic) for emergency lighting applications up to and including 32A*;
- Part 4: *Code of practice for design, installation, maintenance and use of optical fibre systems*;
- Part 5: *Specification for components parts of optical fibre systems*;
- Part 6: *Code of practice for non-electrical low mounted way guidance systems for emergency use — Photoluminescent systems*;
- Part 7: *Lighting applications — Emergency lighting*. (Also numbered BS EN 1838)

The aim of this code is to promote wider understanding of the different types of emergency lighting system which may be employed and to give guidance on their correct application to the varied requirements of different categories of premises.

The recommendations given in this code of practice have been drawn up to encourage uniformity of application, based on providing adequate safety to persons in the event of interruption of the normal lighting and having due regard to the hazard level and degree of familiarity of occupants with particular premises. The code recognizes that in addition to ensuring safe unobstructed means of escape from the premises at all times, an important function of emergency lighting is to make possible the immediate location and operation of fire alarm points and fire fighting equipment and another is to minimize the chance of panic arising in enclosed spaces, such as lifts. Although the code makes recommendations for the provision of emergency lighting in a wide variety of premises, the fact that particular types of premises are mentioned in clause 9 does not necessarily mean that all such premises will be required by law to have emergency lighting installed. For certain classes of premises the provisions of this code may be supplemented or replaced by alternative requirements at the discretion of the enforcing authority.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 24, an inside back cover and a back cover.

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1 Scope

This part of BS 5266 relates to the provision of electric emergency lighting in most types of premises, other than private domestic premises, cinemas and existing premises to which the provisions of CP 1007, covering maintained lighting for cinemas, have been applied by the enforcing authority. Premises not covered are those used primarily as:

- ballrooms and dance halls;
- cinemas licensed under the Cinemas Act 1985;
- bingo premises licensed under the Gaming Act 1968 as amended by the Gaming (Amendment) Act 1982;
- ten-pin bowling establishments.

Although the code does not cover private domestic premises, its provisions are applicable to common access routes within multistorey dwellings.

This code no longer covers the levels of illumination required as these are dealt with in BS EN 1838. References to BS EN 1838 are made throughout the text.

The code gives recommendations for the indication and illumination of escape routes in the event of failure of the normal supply, and proposes minimum continuous periods of operation of such emergency lighting based on the size, type and usage of the premises.

NOTE 1 Should it be necessary to apply the code to any other type of lighting, the exact way in which each of its provisions is to be met should be the subject of agreement with the enforcing and/or other relevant authority before work is started.

NOTE 2 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 5266 the following definitions apply.

2.1

combined (sustained) emergency luminaire

an emergency lighting luminaire containing at least two lamps, one of which is energized from the normal lighting supply and the other from an emergency lighting supply. Such a luminaire is intended to sustain illumination at all material times

2.2

duration

the period of time that the luminaire can continuously provide the minimum illuminance required in the emergency condition. The time is specified in hours

2.3

emergency exit

an exit which is intended to be used only during an emergency

2.4

emergency lighting

lighting provided for use when the supply to the normal lighting fails

2.5

emergency lighting system

a complete but discrete emergency lighting installation from the standby power source to the emergency lighting lamp(s), e.g. a self-contained emergency luminaire or a circuit from a central battery/generator connected through wiring to several escape luminaires

2.6

end of duration battery voltage

the minimum voltage of the battery as declared by the manufacturer that will occur at the end of the rated duration at the end of the declared battery replacement interval

2.7

escape lighting

that part of the emergency lighting which is provided to ensure that the escape route is illuminated at all material times

2.8

escape route

a route forming part of the means of escape from a point in a building to a final exit

2.9

exit

a way out which is intended to be used at any time whilst the premises are occupied

2.10

final exit

the terminal point of an escape route, beyond which persons are no longer in danger from fire

2.11

illuminance

the luminous flux density at a surface, i.e. the luminous flux incident per unit area. The unit of illuminance is lux

NOTE The term "illumination" is now used only to describe the general process of lighting.

2.12

input voltage

the voltage applied to a luminaire

2.13

lighting point

a termination of a fixed wiring system intended for the attachment of a luminaire

2.14**luminaire**

apparatus which distributes, filters and transforms the light given by a lamp or lamps and which includes all the items necessary for fixing and protecting these lamps and for connecting them to the supply circuit

NOTE Internally illuminated signs are a special type of luminaire.

2.15**maintained emergency lighting**

a lighting system in which all emergency lighting lamps are in operation at all material times

2.16**material times**

times during which the emergency lighting is required to be illuminated, e.g. at all times that persons are on the premises, or at the times the main lighting is not available, according to the regulations, conditions of certificate or licence as appropriate

2.17**mounting height**

the vertical distance between a luminaire and the working plane

NOTE Throughout this code the floor is taken to be the working plane.

2.18**nominal battery voltage**

the nominal voltage of a battery as declared by the manufacturer

2.19**non-maintained emergency lighting**

a lighting system in which all emergency lighting lamps are in operation only when the supply to the normal lighting fails

2.20**normal lighting**

all permanently installed electric lighting operating from the normal supply which, in the absence of adequate daylight, is intended for use during the whole time that the premises are occupied

NOTE Also known as "general lighting".

2.21**normal supply**

that source of electrical energy used to provide normal lighting

2.22**premises**

the whole or part of a building which is to be treated as a single unit for the purposes of applying the recommendations of this code

2.23**self-contained emergency luminaire**

a luminaire providing maintained or non-maintained emergency lighting in which all the elements, such as the battery, the lamp, the control unit and the test and monitoring facilities, where provided, are contained within the luminaire or adjacent to it (that is, within 1 m)

2.24**slave luminaire**

luminaire supplied from a central emergency power source and not having its own internal secondary supply

2.25**standby lighting**

that part of emergency lighting which may be provided to enable normal activities to continue

2.26**uniformity**

the ratio of the minimum illuminance to the average illuminance applied to the values on the working plane

NOTE Throughout this code the floor is taken to be the working plane.

3 Consultation and records**3.1 Consultation**

Consultation between the owner and/or occupier of the premises, the architect, the lighting engineer, the installation contractor, the enforcing authority (e.g. the fire authority), the electricity authority and any others concerned should be arranged at a very early stage. In addition to the recommendations of this code it is important that the requirements of any national and/or local legislation which may apply to the premises in question are fully recognized and discussed at this time.

3.2 Supply of plans

Plans showing the layout of the building and of all existing or proposed escape routes, fire alarm call points and fire fighting equipment and indicating the positions of all items, structural or otherwise, which may offer obstruction to escape, should be provided at an early stage for use during the consultations referred to in 3.1.

3.3 Records

On completion of the work, drawings of the emergency lighting installation should be provided and retained on the premises. Such drawings should be regularly updated to keep them in line with any subsequent changes to the system.

In addition, and in accordance with 11.3, a log book should be provided for the recording of routine examinations, tests, defects and alterations.

A manual of operation and maintenance should be handed to the occupier. Recommendations on the measuring of illuminance of emergency lighting are given in annex A.

4 Need for emergency lighting

4.1 General

When the supply to normal lighting of premises fails, emergency lighting may be required. Throughout this code reference to “emergency lighting” covers “escape lighting” in particular, but also includes any element of standby lighting which may be used for escape lighting.

4.2 Escape lighting

When the supply to the normal lighting or parts of the normal lighting to occupied premises fails, escape lighting is required to fulfil the following functions:

- a) to indicate clearly and unambiguously the escape routes;
- b) to provide illumination along such routes to allow safe movement towards and through the exits provided;
- c) to ensure that fire alarm call points and fire fighting equipment provided along escape routes can be readily located.

Escape lighting is required not only on complete failure of the supply to the normal lighting but also on a localized failure if such a failure would present a hazard, e.g. a single subcircuit on stairways.

NOTE High risk task area lighting is covered by BS EN 1838.

4.3 Standby lighting

For areas where a continuous operation is needed during the failure of the supply to the normal lighting, standby lighting should be installed to meet some suitable proportion of the standard service illuminance required for that task.

For extreme situations this may mean providing 100 % service illuminance.

If the standby lighting forms part of the escape lighting, then that part of the escape lighting should be segregated from the rest of the standby lighting circuit and comply with the provisions of this code.

If the whole of the standby lighting is used for escape lighting then the installation should comply with the provisions of this code.

5 Illumination for safe movement

5.1 General

The safe movement of persons along escape routes towards and through the exits provided to a place of safety depends upon the illumination and the ability to see hazards, changes of level and direction.

5.2 Vision and visibility

The stimulus for vision is not the light which falls on objects but the light reflected to the eyes. Different objects are distinguished by contrast, the changes in light reflected to the eyes. A light coloured object on a dark background can be made conspicuous with far less light than a dark coloured object on a dark background.

All calculations of illuminance should be made ignoring reflectance; however, once the system is designed it is preferable to maximize the illumination by reflectance where acceptable.

The amount of light falling on an object (illuminance) is affected not merely by the power and position of the lamps used for illumination but also by reflection from the surroundings. In most interior spaces a very high proportion of the light falling on any surface comes from light reflected from the light sources by other surfaces in the room. Where the walls, floor and ceiling are light in colour, up to 60 % of the illuminance at floor level may have been reflected from the walls or ceiling.

In a room where the decorative finishes are dark in colour (i.e. have low reflectance) the contribution of reflected light to the illuminance is much smaller. The reflected light may be negligible in, say, a discotheque or restaurant, where the carpets, walls and ceiling have been deliberately kept dark in colour to produce a feeling of intimacy and relaxation.

All potential obstructions or hazards on an escape route should be light in colour with contrasting surround. Such hazards include the nosings of stair treads, barriers and walls at right angles to the direction of movement.

By using the light level given in 5.3.3 on an escape route, the recommendations of 5.2, in relation to the use of colour and contrast, and 5.3, in relation to older people, are not essential.

In restricted spaces such as corridors, light coloured decoration throughout is an advantage. Prominent edges to vertical surfaces at changes of direction can assist emergency evacuation.

5.3 Minimum illuminance and adaptation

5.3.1 General

Visual acuity varies considerably from one person to another with regard to the amount of light required to perceive an object clearly and the time taken to adapt to changes in the illuminance (visual adaptation). In general, older people need more light to follow an escape route and have longer visual adaptation times.

The maximum period which should be allowed to elapse between failure of the normal supply and the switch-on of the emergency lighting depends upon the rate at which panic may be expected to mount in a particular building. It also depends upon the time taken to adapt to the new, and normally much lower, illuminance provided by the emergency lighting. The illuminances in this code have been determined from experience and practical test.

5.3.2 Defined escape routes and response times

For routes that are permanently unobstructed and up to 2 m wide the horizontal illuminance at floor level on the centre line of the escape route should be not less than 0.2 lx but preferably 1 lx. For points of emphasis the minimum horizontal illuminance should be

floor along the centre line of the escape route should be not less than 1 lx. In addition, for escape routes up to 2 m wide, 50 % of the route width should be lit to a minimum of 0.1 lx.

The emergency lighting detailed in this clause should be provided within 5 s of the failure of the normal lighting supply, but at the discretion of the enforcing authority this period may be extended to a maximum of 15 s in premises likely to be occupied for the most part by persons who are familiar with them and the escape routes.

Wider escape routes can be treated as a number of 2 m wide bands.

NOTE This subclause contains the detail of the UK "A" deviation given in BS EN 1838:1999.

5.3.3 Undefined escape routes (open areas)

The light levels for these areas are given in BS EN 1838.

5.3.4 Design conditions

Reference should be made to BS EN 1838:1999, 4.3.6. The recommended illuminances that are specified as a maximum or average should be regarded as the lowest value acceptable during the rated discharge period or due to the effects of the system ageing.

In designing a system, allowances should be made for all of the relevant factors, including reduction in voltage, voltage drop in the system wiring, lamp ageing and the accumulation of dirt and dust.

Recommendations on the measuring of illuminance of emergency lighting are given in annex A of this code.

NOTE Further guidance on design can be found in CIBSE technical memorandum TM12 "Emergency lighting" (1986), published by the Chartered Institution of Building Services Engineers¹⁾.

5.4 Uniformity of illuminance

Reference should be made to BS EN 1838:1999, 4.2.2.

Care should be taken to avoid abrupt changes between excessive dark and light areas on the floor of the escape route. It is therefore necessary to illuminate the route reasonably uniformly.

5.5 Glare

Reference should be made to BS EN 1838:1999, 4.2.3.

High contrast between a luminaire and its background may produce glare. In escape route lighting the main problem will be disability glare, in which the brightness of the luminaires may dazzle and prevent obstructions being seen, e.g. the beam of a car headlight or floodlight seen against a very dark background at the end of a corridor.

5.6 Identification of exits and escape routes by signs

Reference should be made to BS EN 1838.

6 Emergency lighting design

6.1 General

Emergency lighting is provided for use when the normal lighting fails and has therefore to be powered from a source independent of that supplying the normal lighting (see 6.11).

6.2 Failure of normal supply to part of a premises

Except in the case of a maintained system, it is normally necessary to ensure that the emergency lighting is provided in the event of the normal supply subcircuit failure in particular areas. This should also be considered desirable where the normal supply distribution system within a large complex involves lateral supplies from a main electrical intake to submain switchrooms and the emergency lighting is supplied from a single central source. In such cases arrangements should be made to ensure that local emergency lighting will operate in the event of failure of normal supply.

6.3 Failure of individual lamp

It is not normally possible to cater for an interruption of the normal lighting due solely to the failure of an individual lamp. Should the normal illumination of, say, a short corridor depend upon a single lamp, consideration should be given to methods of eliminating any probable hazard which might arise due to the failure of this lamp.

6.4 Failure of emergency lighting luminaire

Emergency lighting systems should be designed to ensure that a fault or failure in any one luminaire does not further reduce the effectiveness of the system.

6.5 Mounting height of luminaires

For mounting height see BS EN 1838:1999, 4.1.

The mounting height of the individual luminaires will usually be governed by the physical characteristics of the area under consideration and the best compromise should be chosen. The possibility of smoke accumulation rendering the emergency lighting ineffective should be considered with regard to mounting heights.

6.6 Spacing between luminaires

The provision of a highly reliable illuminance on the escape route is essential. It is therefore better to use a larger number of low power luminaires than few high powered units so that the light reaching any part of the escape route is from more than one luminaire and in the event of a luminaire failing will not plunge the route into total darkness or make the beacon effect of the lights inoperative.

¹⁾ Obtainable from CIBSE, Delta House, 222 Balham High Road, London SW12 9BS.

6.7 Siting of essential escape lighting luminaires

Siting of essential escape lighting luminaires is given in BS EN 1838.

6.8 Siting of additional escape lighting

6.8.1 General

Consideration should be given to provision of additional escape lighting at the locations described in 6.8.2 to 6.8.7.

6.8.2 External areas in the immediate vicinity of exits

To assist dispersal and to enable final exits to be negotiated safely the illuminance in the area immediately external to such exits should not be significantly lower than that immediately inside the exit. Local authority lighting already provided on public thoroughfares may be considered to fulfil the recommendations of this clause; if this is not available then suitable luminaires should be installed outside the exits and linked to the emergency lighting to provide the necessary illuminance.

6.8.3 Lift cars

Except in very special circumstances and then normally only when they are fitted with their own emergency operating power supply, lifts cannot be considered as escape routes. However, lifts do present a problem because the experience of being confined in the dark within a small space for an indefinite period is not only unpleasant, but may cause harm to those who are nervous or suffer from claustrophobia. An emergency lighting luminaire should therefore be fitted in a lift car in which persons may travel. Such luminaires should preferably be of the self-contained type.

NOTE If the disabled are given access to a building, their means of escape in emergency conditions may only be available by lift car (in accordance with BS 5588-5 or BS 5588-8).

6.8.4 Moving stairways and walkways

Moving stairways and walkways should be illuminated as if they were part of an escape route.

6.8.5 Toilets, lobbies and closets

Facilities exceeding 8 m² gross area and facilities of less than 8 m² without borrowed light should be provided with escape lighting complying as if they were part of an escape route.

6.8.6 Motor generator, control and plant rooms

Battery powered emergency lighting should be provided in all motor generator rooms, control rooms, plant rooms, switch rooms and adjacent to main control equipment associated with the provision of normal and emergency lighting to the premises.

6.8.7 Covered car parks

The pedestrian escape routes from covered and multi-storey car park areas should be easily identifiable and should be provided with emergency lighting.

6.9 Emergency signs

6.9.1 Signs for exits and escape routes

Signs are required to ensure that escape routes from any position within the premises may be easily recognized and followed in an emergency.

Where direct sight of an exit or emergency exit is not possible and there could be any doubt as to the direction of the appropriate exit, a directional sign or series of signs should be provided, so placed that a person moving towards each sign will be progressed towards an exit or emergency exit.

6.9.2 Mounting height of signs

Signs should be positioned between 2 m and 2.5 m above floor level measured to the base of the sign. If this is not practicable the relevant authority should be consulted (see 3.1 and 6.5).

6.9.3 Illumination of signs

The illumination of signs is covered by BS EN 1838:1999, clause 5.

6.10 Escape lighting luminaires

6.10.1 Construction

Emergency lighting luminaires can be either self-contained (sometimes referred to as self-contained emergency luminaires) or slave luminaires. Both may be used for escape signs or escape route lighting. These luminaires should be designed and constructed in accordance with BS EN 60598-2-22. For certain applications the luminaire itself should have satisfactory protection against the ingress of foreign bodies or moisture; such protections are indicated by the IP classification as defined in BS EN 60529. Furthermore, if used in hazardous areas, where luminaires are certified to national or international standards by a recognized certification authority, compliance with temperature limits and explosion protection may be required. (See BS 5345 and BS 6467-2.)

6.10.2 Flammability

Emergency lighting luminaires used on defined escape routes (see 5.3.2) should comply with the non-flammability (resistance to flame and ignition) provisions specified in BS EN 60598-2-22 and external parts should also be subjected to the 850 °C hot wire test; any burning parts should self-extinguish within 30 s.

6.11 Mode of operation

6.11.1 General

The recommendations of 6.11 are written primarily in terms of battery systems, although similar considerations will apply to the possible alternatives mentioned (see 6.11.4).