

BS 5266-1:2016



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Emergency lighting –

Part 1: Code of practice for the emergency lighting of premises



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Summary of pages

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Foreword

Publishing information

This part of BS 5266 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 May 2016. It was prepared by Subcommittee EL/1/1, *Emergency lighting*, under the authority of Technical Committee EL/1, *Light and lighting applications*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This part of BS 5266 supersedes BS 5266-1:2011, which is withdrawn.

Relationship with other publications

This part of BS 5266 is intended for use in conjunction with BS EN 1838 and BS EN 50172.

BS EN 50172:2004, 4.1 specifies compliance with the wiring rules given in HD 384/HD 60364. The UK applicable parts of HD 384/HD 60364 are implemented in the IET Wiring Regulations (BS 7671).

BS 5266 is published in the following parts:

- Part 1: *Code of practice for the emergency lighting of premises;*
- Part 2: *Code of practice for electrical low mounted way guidance systems for emergency use;*
- 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 8: *Emergency escape lighting systems (also numbered BS EN 50172).*

The following topics are covered in BS EN 50172 and BS EN 1838:

- general requirements for emergency escape lighting;
- escape route lighting;
- open area (anti-panic) lighting;
- high risk task area lighting;
- standby lighting.

Detailed guidance on fire risk assessments is given in PAS 79, in a series of guides published by the Department for Communities and Local Government [1–11], and in guidance published by the Justice Department of the Scottish Government [12–21].

Guidance on risk assessments for health and safety is given in HSE publication INDG 163 [22].

A summary of the hierarchy of standards covering the different aspects of emergency lighting systems is given in Annex A.

Information about this document

This is a full revision of the standard. The principal change introduced is an expansion of the scope to cover emergency safety lighting and standby lighting, as well as emergency escape lighting.

The aim of this standard 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 standard have been drawn up to encourage uniformity of application, based on providing adequate safety to people 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 standard 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 call points and fire-fighting equipment, and another is to minimize the chance of panic arising in enclosed spaces, such as lifts. Although the standard 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 are required by law to have emergency lighting installed. For certain types of premises, the provisions of this standard might be supplemented or replaced by alternative requirements at the discretion of the enforcing authority.

Use of this document

As a code of practice, this part of BS 5266 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this part of BS 5266 is expected to be able to justify any course of action that deviates from its recommendations.

BSI permits the reproduction by individual users of BS 5266-1:2016, Figures H.1, H.2, H.3, H.4, I.1, I.2, K.1, K.2, M.1, M.2 and M.3. This reproduction is only permitted where it is necessary for the user to use the sample certificates given in the figures during each application of the standard.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Particular attention is drawn to legal requirements in respect of emergency lighting. Further guidance is given in the Building Regulations 2010, Approved Document B [23] and its equivalents in Wales [24], Scotland [25] and Northern Ireland [26].

Introduction

UK legislation imposes a duty on persons, including employers and other persons with control of premises, to carry out risk assessments and to take such precautions as to ensure as far as reasonably practicable the safety of the occupants. These measures include the provision of safe means of escape, including emergency escape routes and exits, together with, where necessary, signs indicating them. Legislation also states that suitable and sufficient emergency lighting needs are to be provided, where people are particularly exposed to danger, in the event of failure of the supply to the normal lighting.

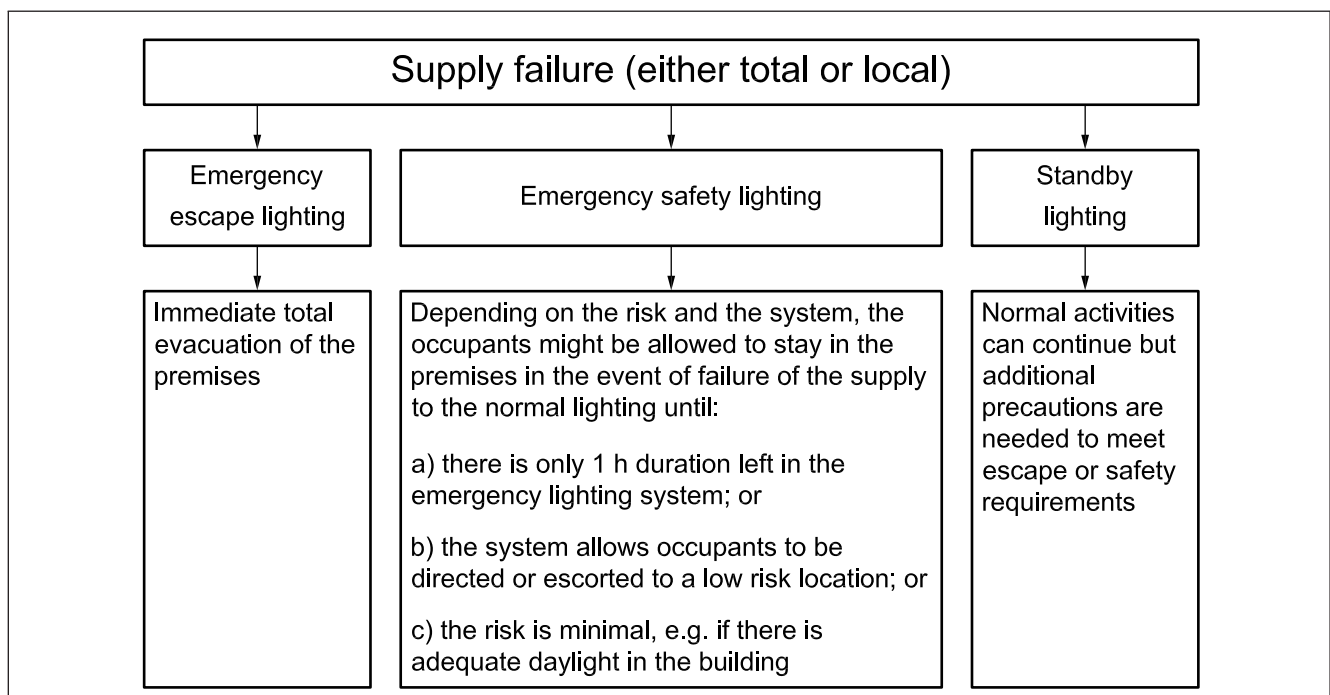
There is increasing recognition of the application of emergency lighting to assist the safety of occupants who stay in a building during a mains supply failure. In many instances, particularly in places with frequently occurring power cuts, it might not be necessary or appropriate to evacuate the premises in the event of failure of the supply to the normal lighting, but precautions need to be taken to enable occupants to remain on the premises in safety. This revised edition of the standard covers the use of emergency lighting in premises that are not evacuated immediately, as well as conventional emergency escape lighting. Some guidance on new developments in emergency lighting application and technology is given in Annex B.

Emergency lighting can perform the following functions, some of which can be combined into a single system:

- emergency escape lighting, which provides illumination of escape routes, signs and points of emphasis to assist occupants to evacuate the premises;
- emergency safety lighting, which provides lighting for safe movement in the premises when the occupants need not evacuate the premises immediately;
- standby lighting, powered by an alternative power supply, which provides sufficient lighting to operate the premises normally in the event of a total failure of the main power supply.

The different types of emergency lighting are illustrated in Figure 1. Guidance on the application of emergency lighting systems is given in Annex C.

Figure 1 Types of emergency lighting



1 Scope

This part of BS 5266 gives recommendations and guidance on the factors that need to be taken into account in the design, installation and wiring of electrical emergency lighting systems, in order to provide the lighting performance needed for safety of people in the building in the event of failure of the supply to the normal lighting.

This British Standard applies to emergency lighting systems used to:

- a) assist occupants to leave a building during an emergency;
- b) help protect occupants if they stay in a building during an emergency;
- c) help occupants to continue normal operations in the event of failure of the supply to the normal lighting.

This part of BS 5266 also gives recommendations for lighting in areas with fixed seating.

This part of BS 5266 is not applicable to dwellings; however, its provisions are applicable to common access routes within blocks of flats or maisonettes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 4678-4, *Cable trunking – Part 4: Specification for cable trunking made of insulating material*

BS 5499-4:2013, *Safety signs – Part 4: Code of practice for escape route signing*

BS 5499-10:2014, *Guidance for the selection and use of safety signs and fire safety notices*

BS 7273-4, *Code of practice for the operation of fire protection measures – Part 4: Actuation of release mechanisms for doors*

BS 7629-1, *Electric cables – Specification for 300/500 V fire resistant, screened, fixed installation cables having low emission of smoke and corrosive gases when affected by fire – Part 1: Multicore cables*

BS 7846, *Electric cables – Thermosetting insulated, armoured, fire-resistant cables of rated voltage 600/1 000 V for fixed installations, having low emission of smoke and corrosive gases when affected by fire – Specification*

BS 8434-2, *Methods of test for assessment of the fire integrity of electric cables – Part 2: Test for unprotected small cables for use in emergency circuits – BS EN 50200 with 930 deg flame and with water spray*

BS 8519, *Selection and installation of fire-resistant power and control cable systems for life safety and fire-fighting applications – Code of practice*

BS 8592, *Electric cables – Thermosetting insulated, non-armoured, fire-resistant, single core non-sheathed cables of rated voltage 450/750 V, having low emission of smoke and corrosive gases when affected by fire – Specification*

BS EN 81-20, *Safety rules for the construction and installation of lifts – Lifts for the transport of persons and goods – Part 20: Passenger and goods passenger lifts*

BS EN 1838, *Lighting applications – Emergency lighting* ¹⁾

BS EN 50171, *Central power supply systems* ²⁾

BS EN 50172 (BS 5266-8), *Emergency escape lighting systems* ³⁾

BS EN 50200:2015, *Method of test for resistance to fire of unprotected small cables for use in emergency circuits*

BS EN 60529, *Degrees of protection provided by enclosures (IP code)*

BS EN 60598-2-22:2014, *Luminaires – Part 2-22: Particular requirements – Luminaires for emergency lighting*

BS EN 60702-1, *Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V – Part 1: Cables*

BS EN 60702-2, *Mineral insulated cables and their terminations with a rated voltage not exceeding 750 V – Part 2: Terminations*

BS EN 61386 (all parts), *Conduit systems for cable management*

BS EN ISO 7010:2012+A5:2015, *Graphical symbols – Safety colours and safety signs – Registered safety signs*

BS ISO 3864-4:2011, *Graphical symbols – Safety colours and safety signs – Part 4: Colorimetric and photometric properties of safety sign materials*

IEC 60331-3, *Tests for electric cables under fire conditions – Circuit integrity – Part 3: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV tested in a metal enclosure*

3 Terms and definitions

For the purposes of this part of BS 5266, the terms and definitions given in BS EN 1838, BS EN 50171, BS EN 50172, BS EN 60598-2-22:2014 and the following apply.

3.1 borrowed light

light obtained from an adjacent reliable source that is expected to be available at all material times

NOTE For example, from a local emergency luminaire.

3.2 centrally supplied emergency luminaire

luminaire for maintained or non-maintained operation which is energized from a central emergency power system that is not contained within the luminaire

[SOURCE: BS EN 60598-2-22:2014, 22.3.9]

3.3 competent person

person with the relevant current training and experience, and with access to the requisite tools, equipment and information, and capable of carrying out a defined task

3.4 emergency exit

way out that is used during an emergency

[SOURCE: BS EN 50172:2004, 3.8]

¹⁾ This part of BS 5266-1 also gives informative references to BS EN 1838:2013.

²⁾ This part of BS 5266-1 also gives an informative reference to BS EN 50171:2001.

³⁾ This part of BS 5266-1 also gives an informative reference to BS EN 50172:2004.

- 3.5 emergency escape lighting**
that part of emergency lighting that provides illumination for the safety of people leaving a location or attempting to terminate a potentially dangerous process before doing so
[SOURCE: BS EN 1838:2013, 3.3]
- 3.6 emergency lighting**
lighting provided for use when the supply to the normal lighting fails
[SOURCE: BS EN 1838:2013, 3.1]
- 3.7 emergency safety lighting**
that part of emergency lighting that provides illumination for the safety of people staying in a premises when the supply to the normal lighting fails
- 3.8 escape route**
route designated for escape to a place of safety in the event of an emergency
[SOURCE: BS EN 50172:2004, 3.2]
- 3.9 final exit**
terminal point of an escape route
[SOURCE: BS EN 50172:2004, 3.9]
- 3.10 high risk task area lighting**
that part of emergency escape lighting that provides illumination for the safety of people involved in a potentially dangerous process or situation and to enable proper shut-down procedures for the safety of the operator and other occupants of the premises
[SOURCE: BS EN 1838:2013, 3.6]
- 3.11 maintained emergency luminaire**
luminaire in which emergency lighting lamps are energized at all times when normal or emergency lighting is required
[SOURCE: BS EN 60598-2-22:2014, 22.3.5]
- 3.12 material times**
times at which the premises are occupied
- 3.13 non-maintained emergency luminaire**
luminaire in which the emergency lighting lamps are in operation only when the supply to the normal lighting fails
[SOURCE: BS EN 60598-2-22:2014, 22.3.6]
- 3.14 open area lighting**
that part of emergency escape lighting provided to avoid panic and provide illumination allowing people to reach a place where an escape route can be identified
Note 1 to entry: In some countries this is known as anti-panic lighting.
[SOURCE: BS EN 1838:2013, 3.5]
- 3.15 place of safety**
place in which persons are in no danger
[SOURCE: BS EN 50172:2004, 3.5]

3.16 responsible person

delegated individual who is responsible for the provision and operation of appropriate emergency escape lighting

NOTE This might not necessarily be the same as the responsible person as defined in the Regulatory Reform (Fire Safety) Order 2005 [27].

3.17 sign height

diameter of a circular geometric shape or height of a rectangular or triangular geometric shape

[SOURCE: BS ISO 3864-1:2011, 3.13]

3.18 standby lighting

that part of emergency lighting provided to enable normal activities to continue substantially unchanged

[SOURCE: BS EN 1838:2013, 3.7]

4 Consultation and records

4.1 Consultation

Consultation between the responsible person, the owner/developer and/or occupier of the premises, the architect, the lighting engineer, the installation contractor, the enforcing authorities (e.g. the building control body), the electricity supplier/distributor and any others concerned, should be arranged at a very early stage.

The consultation stage should define the way in which the system is intended to operate, including information as to whether the premises are to be evacuated immediately in the event of failure of the supply to the normal lighting, or whether occupants are likely to stay in the building.

If a “stay put” strategy is agreed as part of the emergency plan for the premises, procedures for maintaining safety should be determined, including:

- a) actions to be taken as the end of emergency duration approaches;
- b) how to warn the occupants if they then need to evacuate the premises;
- c) how to direct or escort the occupants to safe refuges, if these are to be used.

Appropriate testing procedures should be agreed that meet the recommendations in Clause 12 and are suitable for the premises.

Other relevant factors, such as the areas and types of premises to be covered, the numbers and location of occupants and the location of exit routes, should be given to the system designer.

An assessment should be made of potential risks to occupants in a building that could occur in the event of failure of the supply to the normal lighting, and suitable compensating safety provisions should be determined.

NOTE 1 Some guidance on developments in emergency lighting application and technology, which might assist in determining the most appropriate design option, is given in Annex B.

NOTE 2 There might be statutory requirements and/or local conditions that apply to the premises in question, including the need for a risk assessment (see Introduction).

NOTE 3 It is strongly advised that in premises where occupants are expected to stay in place through a supply failure, an automatic test system is used.

NOTE 4 Where the escape route leaves the building, the escape route may continue to a place of safety.

4.2 Supply of plans

Plans of the premises should be available at an early stage to assist the consultation stage and system design. These should include:

- a) escape routes;
- b) open areas;
- c) high risk task areas;
- d) safety equipment, including fire safety equipment, safety signs and any other aspects identified by risk assessment;
- e) details of normal lighting and its control system.

NOTE The supply of plans is specified in BS EN 50172:2004, 5.1.

4.3 Records

Records of the emergency lighting system should be kept, including the location and type of emergency lighting system components, e.g. luminaires, test devices and any central power units.

Copies of these records should be passed to the responsible person to assist with future investigations, and to assist in the design of any extensions or modifications to the premises or the emergency lighting system.

NOTE 1 The supply of drawings and log book is specified in BS EN 50172:2004, 6.1.

NOTE 2 Records need to be archived in an electronic format wherever possible.

5 Illumination for emergency lighting conditions

COMMENTARY ON CLAUSE 5

The safe movement of people 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.

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 of 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.

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 many interior spaces, a high proportion of the light falling on any surface comes from the light sources reflected 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 might 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 might be negligible in, say, a club or restaurant, where the carpets, walls and ceiling have been deliberately kept dark in colour to produce a feeling of intimacy and relaxation.

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.

All potential obstructions or hazards on an escape route need to 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.

5.1 General

For all premises offering escape or safety protection, the building should be protected in accordance with BS EN 1838 and the relevant recommendations given in BS 5266-1.

5.2 Illumination for safe escape – Emergency escape lighting

COMMENTARY ON 5.2

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, and those with impaired vision, need more light to follow an escape route and have longer visual adaptation times.

The maximum period which needs to be allowed to elapse between failure of the normal supply and the switch-on of the emergency lighting depends upon:

- a) whether panic could arise amongst a significant number of people, which in turn depends upon factors such as the type of building and the people themselves (knowledge, training, physical and mental conditions); and*
- b) the time taken to adapt to the new, and normally much lower, illuminance provided by the emergency lighting.*

The illuminances in this standard have been determined from experience and practical test.

Further guidance is given in BRE Information Paper 9/97 [28], which identifies conditions that benefit from a minimum illuminance of 3 lx on the centre line of the escape route.

Guidance on the application of emergency lighting systems is given in Annex C.

5.2.1 General

In the event of a failure of the supply to the normal lighting, emergency escape lighting should be available to assist occupants to evacuate a building safely by:

- a) locating and identifying exit signs at doors and escape route direction signs;
- b) using the escape routes;
- c) conducting safety measures prior to evacuation, such as shutting equipment down safely or checking that all personnel have vacated the premises.

The duration of the emergency escape lighting should include time to evacuate disabled occupants or to release anyone trapped in a lift.

If evacuation is not immediate in the event of a failure of the supply to the normal lighting, emergency safety lighting should be provided in accordance with 5.3, as well as standby lighting in accordance with 5.4.

5.2.2 Design conditions

The recommended illuminances that are given as a minimum (escape routes and open areas) or average (high risk task areas) should be regarded as the lowest value acceptable during the rated duration, taking into account the effects of reduction in voltage, voltage drop in the system wiring, battery ageing, lamp ageing and the accumulation of dirt and dust.

Calculations of illuminance should be made ignoring reflectance. However, with lighting systems such as indirect luminaires and uplights, where the luminaire works in conjunction with a reflecting surface, the first reflection should be taken as the direct light output and subsequent reflections should be ignored.

NOTE 1 Guidance on the measuring of illuminance of emergency lighting is given in Annex D.

NOTE 2 Further guidance on design can be found in CIBSE/ISLL publication LG 12 [29] and BS EN 1838:2013.

5.2.3 Uniformity and diversity of illuminance

Care should be taken to avoid abrupt variation between excessively bright and dark areas on the floor of the escape route and open areas, and the locations of high risk hazards.

NOTE Uniformity and diversity of illuminance are specified in BS EN 1838:2013.

5.2.4 Disability glare

High luminous intensity emergency luminaires can interfere with observation of emergency exit signs, routes and obstructions (disability glare), so such luminaires should be located at least 30° out of direct line of sight when observing the escape route. Directional luminaires should be directed such that they do not cause disability glare.

NOTE Limitation of disability glare is specified in BS EN 1838:2013.

5.2.5 Defined escape routes

To assist escape routes to be used at all times, the horizontal illuminance on the floor along the centre line of an escape route up to 2 m in width should be not less than 1 lx.

NOTE 1 Illuminances, including the provision of appropriate illuminance near each exit door and other positions to be emphasized, and response times, are specified in BS EN 1838:2013, 4.2.1.

NOTE 2 Some existing installations might have been engineered to a previous minimum of 0.2 lx along the centre line of an escape route. These installations need to be reviewed to check that their illumination level continues to be acceptable for the application.

5.2.6 Open areas

Rooms with a floor area greater than 60 m², or those having been risk assessed as needing emergency lighting, should be provided with horizontal illuminance of not less than 0.5 lx at the floor level of the area, excluding a border of 0.5 m around the perimeter.

NOTE 1 Illuminances for open areas are given in BS EN 1838:2013.

NOTE 2 Typical factors for consideration in a risk assessment are underground or windowless areas, high levels of occupancy, an escape route passing through the area or the need to switch off other equipment before leaving.

NOTE 3 Figure 2 shows an example of areas requiring emergency lighting.

5.2.7 High risk task areas

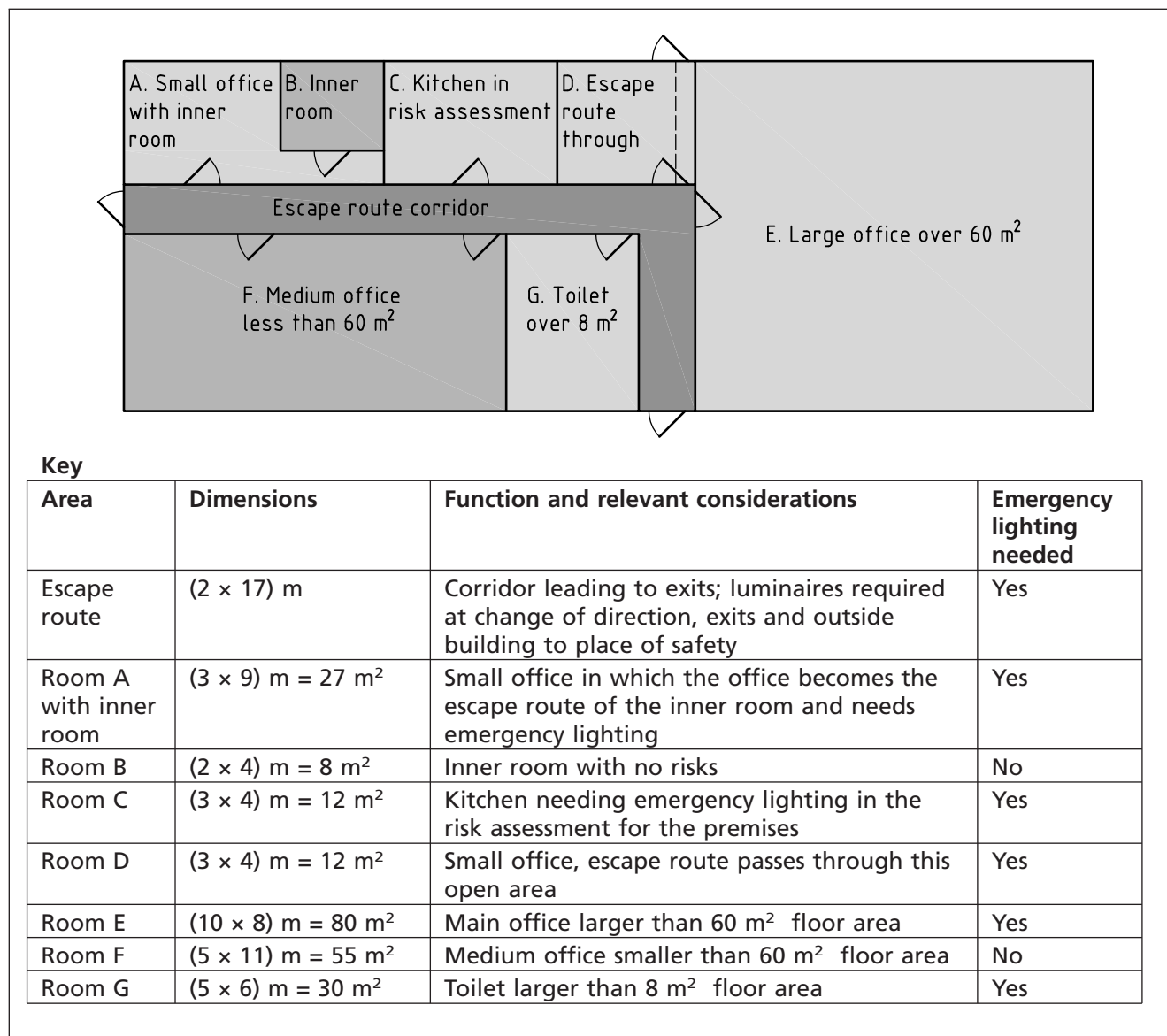
If emergency escape lighting is required to provide illumination for the safety of people involved in a potentially dangerous process or situation, and to enable proper shut-down procedures for the safety of the operator and other occupants, the illuminance value should be not less than 10% of the average of the normal lighting at the location of the point of the risk.

NOTE 1 Some activities might need considerably higher illuminances than the minimum value. Requirements for high risk task area lighting are specified in BS EN 1838:2013.

Because the presence of dangerous processes makes the initial period important, the time taken for the full emergency escape lighting to activate should be not more than 0.5 s.

NOTE 2 Guidance on appropriate levels for activities that need to be terminated but are not assessed as potentially dangerous is given in Annex E.

Figure 2 Example of rooms requiring emergency lighting



5.2.8 Siting of luminaires

COMMENTARY ON 5.2.8

Emergency lighting luminaires not only provide illumination, but their presence acts as beacons over points of emphasis of both safety equipment and hazard points in the building. Consequently, their physical location is important both for the use of the escape route and for safe occupation prior to evacuation.

Subclause 5.2.8.1 gives general recommendations for siting of luminaires, and subclauses 5.2.8.2 to 5.2.8.7 give recommendations for siting of luminaires in specific locations. Other hazards might be present in locations where activities that are safe with normal mains illumination can be a risk in a supply failure and activities need to be illuminated prior to evacuation. Typical levels of emergency lighting for such hazards are given in Annex E.

5.2.8.1 General

Siting and illuminance levels of emergency escape lighting luminaires should be in accordance with BS EN 1838.

Emergency escape lighting should be provided in escape routes, open areas, high risk task areas, and points of emphasis including:

- a) near (see Note 1) each exit door intended to be used in an emergency;
- b) near (see Note 1) stairs so that each flight of stairs receives direct light;
- c) near (see Note 1) any other change in level;
- d) externally illuminated escape route signs, escape route direction signs and other safety signs needing to be illuminated under emergency lighting conditions;
- e) at each change of direction (see Note 2);
- f) at each intersection of corridors (see Note 2);
- g) near (see Note 1) to each final exit and outside the building to a place of safety;
- h) near (see Note 1) each first aid post;
- i) near (see Note 1) each piece of fire-fighting equipment and call point;
- j) near (see Note 1) escape equipment provided for disabled people;
- k) near (see Note 1) refuges and call points, including two-way communication systems and disabled toilet alarm call position;
- l) near (see Note 1) manual release controls provided to release electronically locked doors as recommended in BS 7273-4.

NOTE 1 For the purpose of this subclause, "near" is normally considered to be within 2 m measured horizontally.

NOTE 2 For the purpose of this subclause, "at" means that the emergency luminaire would illuminate in both directions at the change of direction or intersection.

5.2.8.2 External areas in the immediate vicinity of exits

Emergency illumination should be provided outside the building and near to each final exit. If occupants have to travel to reach a place of safety, this route should form an integral part of the escape route.

NOTE Illumination of these areas is specified in BS EN 1838:2013 and BS EN 50172.

Existing installations might have used external street lighting to illuminate external exits. These applications should be reassessed to confirm whether the street lights will still be illuminated at all times the premises is in use; if they will not, alternative arrangements should be made.

5.2.8.3 Evacuation lift cars

Emergency illumination within evacuation lift cars should be provided as specified in BS EN 81-20.

NOTE BS 9999 gives guidance on lifts used as a means of escape.

5.2.8.4 Moving stairways and walkways

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

5.2.8.5 Toilet facilities and changing rooms

Facilities for use by disabled people, and/or any multiple closet facilities without borrowed light, should have emergency illumination from at least one luminaire.

All facilities exceeding 8 m² gross area should be provided with emergency lighting as if they were open areas (see 5.2.6).

NOTE Provision of emergency lighting in accordance with this subclause does not necessitate the provision of emergency lighting in toilets designed to accommodate only a single able-bodied person, or in en suite toilets or bathrooms in hotel bedrooms.

5.2.8.6 Motor generator, control, plant and switch rooms

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

Where motor generators are used for emergency lighting, battery-powered emergency luminaires should be provided in the vicinity of the control gear to allow for start-up time.

5.2.8.7 Covered car parks

Pedestrian escape routes from covered and multi-storey car parks should be provided with emergency lighting. The risk assessment should identify the extent and location of the pedestrian escape route.

5.2.9 Safety signs

5.2.9.1 Escape route signs

5.2.9.1.1 General

Escape route signs should be located and operated in accordance with BS 5499-4:2013. The signs designated as E001 and E002 in BS EN ISO 7010:2012+A5 should be used, with the appropriate directional arrow in accordance with BS 5499-4:2013, Table 1.

5.2.9.1.2 Colorimetric and photometric characteristics

Escape route signs should have the following colorimetric and photometric characteristics.

- a) **Internally illuminated escape route signs, when powered.** The following recommendations should be met for internally illuminated escape route signs when powered.
 - 1) The colorimetric and photometric requirements specified in BS ISO 3864-4:2011, Table 2, and the luminance contrast requirements specified in BS ISO 3864-4:2011, Table 3 should be met.
 - 2) The minimum luminance of the safety colour green should be at least 2 cd/m² and the luminance of the contrast colour white five to fifteen times that of the luminance of the adjacent green.
 - 3) The ratio of maximum luminance to minimum luminance within either white or green should be not greater than 10:1.
 - 4) In the application of powered internally illuminated escape route signs in normal lighting conditions, higher luminance values of the signs should be appropriate to the luminous environment for identifiability. The criteria for luminance contrast and the ratio of luminances within each colour should be met.

- 5) The response time for escape route signs should conform to BS EN 1838.
- 6) The duration should be the same as the installed emergency lighting.
- b) **Internally illuminated escape route signs, when unpowered.** An internally illuminated escape route sign when unpowered, as might be the case during normal lighting conditions, should meet the colorimetric and photometric requirements of BS ISO 3864-4:2011, Table 1 for externally illuminated escape route signs.
- c) **Externally illuminated escape route signs.** Externally illuminated escape route signs should meet the colorimetric and photometric requirements of BS ISO 3864-4:2011, Table 1. During emergency lighting conditions, the illuminance on any part on the face of externally illuminated escape route signs should be not less than 5 lx.

5.2.9.1.3 Sign height and viewing distance

The maximum viewing distance normal to escape route signs should be determined from the sign height, using the recommendations given in BS 5499-4:2013, Clause 6 and factor of distance in BS 5499-4:2013, Table 3 for powered internally illuminated escape route signs, or BS 5499-4:2013, Table 2 for externally illuminated escape route signs.

NOTE 1 The E001 and E002 originals in BS EN ISO 7010:2012+A5 are in a uniform 70 mm size with corner marks to enable accurate enlargement and reduction scaling. A border is not shown.

NOTE 2 The height of E001 and E002 is a scaled size of the 70 mm template size. For the supplementary direction arrow, the height is scaled from the size of the image given under "Additional information for E001 and E002".

NOTE 3 For powered internally illuminated escape route signs, the value of distance factor of 200 given in BS EN 1838:2013, 5.5 is applicable when the mean luminance of the white contrast colour is at least 100 cd/m².

NOTE 4 For externally illuminated escape route signs, the value of distance factor of 100 given in BS EN 1838:2013, 5.5 is applicable when the vertical illuminance on the sign is at least 5 lx.

Where the angle of viewing of the escape route sign is not predominantly normal to the sign, the effect of angle of viewing should be taken into account, using the recommendations given in BS 5499-4:2013, and the factor of distance reduced by a multiplying factor of cosine of the angle of viewing to the normal to the sign.

5.2.9.2 Other safety signs

5.2.9.2.1 General

NOTE The provision of safety signs, other than escape route signs, their format and meaning using BS EN ISO 7010:2012+A5, is covered by BS 5499-10:2014 for normal and emergency lighting conditions.

Safety signs should be located and operated in accordance with BS 5499-10:2014.

The need for specific safety signs to be illuminated under emergency lighting conditions should be established during the risk assessment of the premises using the recommendations given in BS 5499-10:2014.

5.2.9.2.2 Colorimetric and photometric characteristics

Safety signs other than escape route signs should have the following colorimetric and photometric characteristics.

- a) **Internally illuminated safety signs, when powered.** The following recommendations should be met for internally illuminated safety signs when powered.
 - 1) The colorimetric and photometric requirements specified in BS ISO 3864-4:2011, Table 2, and the luminance contrast requirements specified in BS ISO 3864-4:2011, Table 3 should be met.
 - 2) The minimum luminance of the safety colour (green, red, yellow or blue) should be at least 2 cd/m² and the luminance of the contrast colour white five to fifteen times that of the luminance of the green, red, or blue measured according to BS ISO 3864-4.
 - 3) The ratio of maximum luminance to minimum luminance within either white or safety colour should be not greater than 10:1.
 - 4) In the application of powered internally illuminated safety signs in normal lighting conditions, higher luminance values of the signs should be appropriate to the luminous environment for identifiability. The criteria for luminance contrast and the ratio of luminances within each colour should be met.
 - 5) The response time for safety signs should conform to BS EN 1838.
 - 6) The duration should be the same as the installed emergency lighting.
- b) **Internally illuminated safety signs, when unpowered.** An internally illuminated safety sign when unpowered, as might be the case during normal lighting conditions, should meet the colorimetric and photometric requirements of BS ISO 3864-4:2011, Table 1 for externally illuminated safety signs.
- c) **Externally illuminated safety signs.** Externally illuminated safety signs should meet the colorimetric and photometric requirements of BS ISO 3864-4:2011, Table 1. During emergency lighting conditions, the illuminance on any part on the face of externally illuminated safety signs should be not less than 5 lx.

5.2.9.2.3 Sign height and viewing distance

The maximum viewing distance normal to safety signs should be determined from the sign height using the recommendations given in BS 5499-10:2014, 4.8.2 and factor of distance in BS 5499-10:2014, Table 1 for externally illuminated safety signs, or a factor of distance of 60 under emergency and normal lighting conditions for powered internally illuminated safety signs.

Where the angle of viewing of the safety sign is not predominantly normal to the sign, the effect of angle of viewing should be taken into account, using the recommendations given in BS 5499-10:2014, and the factor of distance reduced by a multiplying factor of cosine of the angle of viewing to the normal to the sign.

5.3 Illumination for safety in the building – Emergency safety lighting

COMMENTARY ON 5.3

If a building is not evacuated immediately, additional measures to those recommended in 5.2 might need to be included in the risk assessment. These might include, for example, a need for emergency lighting in rooms where occupants are able to stay put, and also higher light levels.

If the risk assessment allows occupants to stay in the building, it is also necessary to take measures to maintain safety as the end of the emergency approaches.

Guidance on the application of emergency lighting systems is given in Annex C.

5.3.1 General

If a risk assessment shows that emergency safety lighting is needed, it should meet the recommendations given in 5.3.2 and 5.3.3.

5.3.2 Minimum illuminance

The minimum illuminance over the area where people might have to move during a failure of the supply to the normal lighting should be not less than 1 lx on the floor area.

NOTE 1 The minimum illuminance required for safe movement in the building overall under normal conditions is specified in the Health and Safety Executive publication HSG 38 [30].

NOTE 2 A higher illuminance might assist people with visual impairments. Guidance is given in BRE information paper 9/97 [28]; see also the Commentary on 5.2.

5.3.3 Safety signs

Escape route signs should be identifiable and in accordance with 5.2.9.1.

Other safety signs should be identifiable and in accordance with 5.2.9.2.

5.4 Illumination for continued activity – Standby lighting

NOTE Some premises use standby power supplies to replace the input power to the luminaires if the normal mains supply fails.

Standby lighting powered by an alternative power supply source, such as a generator, should provide the same lighting conditions as those provided by the normal lighting system. This lighting should permit occupants to operate the premises normally.

If standby lighting is to form the emergency escape or emergency safety lighting, the equipment, wiring and installation should be in accordance with the recommendations given in Clause 6, Clause 7 and Clause 8.

6 Emergency lighting design

COMMENTARY ON CLAUSE 6

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

6.1 System integrity

To ensure that emergency lighting will be provided when required, failure of the final circuit supply to the normal lighting should activate non-maintained emergency luminaires.

NOTE System integrity is specified in BS EN 50172:2004, 5.3.

6.2 Failure of individual normal lamp

Wherever possible, the condition of individual normal lighting lamps or luminaires or their failure should not prejudice the safety of occupants, so their condition does not need to activate the emergency lighting. If failure of an individual normal luminaire could prejudice safety, maintained emergency luminaires should be used in the area.

NOTE This is covered by BS EN 50172:2004, Note to 5.3.

6.3 Failure of emergency lighting luminaire

The risk of occupants being in total darkness in the event of failure of individual emergency lighting luminaires should be minimized by ensuring that illumination from at least two luminaires or emergency exit signs with a usable downward light element is visible in:

- a) each room (open areas) requiring emergency lighting; and
- b) the escape route.

This should be determined on the basis that all doors will be shut; however, glazed panels allowing sufficient illumination from an adjacent part of the escape route might be acceptable.

NOTE System integrity is specified in BS EN 50172:2004, 5.3.

6.4 Mounting height of luminaires

The normal height for luminaires should be at least 2 m, but the mounting height might need to be adjusted for the application, taking into account the effects of glare, the need to be below the possible build-up of smoke in smoke reservoirs, conditions in specific buildings (e.g. heritage buildings), or to highlight specific hazards such as stairs.

NOTE System mounting heights are specified in BS EN 1838:2013.

6.5 Spacing between luminaires

The provision of a highly reliable illuminance on escape routes is essential. A larger number of low light output luminaires placed close together should therefore be used in preference to a few high light output units spaced further apart, in case a single light source fails and to minimize glare.

6.6 Classification of operation of emergency lighting systems

For inspection and to assist those working on emergency lighting systems, the systems should be identified with their classification (see Annex F).

6.7 Choice of appropriate emergency lighting systems

6.7.1 Selection of appropriate emergency lighting luminaires

Emergency lighting luminaires can be either self-contained emergency luminaires or centrally supplied emergency luminaires. Both may be used for escape route signs or emergency lighting. For certain applications, the luminaire itself should have satisfactory protection against the ingress of foreign bodies or moisture, using the appropriate IP classification as defined in BS EN 60529.

Details of the approvals and performance should be confirmed with the user and full documentation added to the system records.

NOTE 1 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 might be required. (See BS EN 60079-14.)

NOTE 2 BS EN 50172:2004, 5.5.1 specifies a requirement for emergency escape lighting luminaires to be designed and constructed in accordance with BS EN 60598-2-22. It also specifies a requirement for them to be selected to be appropriate for their location.