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NSAI
Standards

Irish Standard
I.S. 3217:2013+A1:2017

Emergency Lighting and Amendment 1:2017

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I.S. 3217:2013+A1:2017

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Údarás um Chaighdeán Náisiúnta na hÉireann

**DECLARATION
OF
SPECIFICATION
EMERGENCY LIGHTING AND AMENDMENT 1:2017
AS
THE IRISH STANDARD SPECIFICATION FOR
EMERGENCY LIGHTING AND AMENDMENT 1:2017**

NSAI in exercise of the power conferred by section 16 (5) of the National Standards Authority of Ireland Act, 1996 (No. 28 of 1996) and with the consent of the Minister for Jobs, Enterprise and Innovation, hereby declare as follows:

1. This instrument may be cited as the Standard Specification (Emergency Lighting and Amendment 1:2017) Declaration, 2017.
2. (1) The Specification set forth in the Schedule to this declaration is hereby declared to be the Standard Specification for Emergency Lighting and Amendment 1:2017.
(2) The said Standard Specification may be cited as Irish Standard 3217:2013+A1:2017 or as I.S 3217:2013+A1:2017.
3. (1) The Standard Specification (Emergency Lighting) Declaration 2013 is hereby revoked.
(2) Reference in any other Standard Specification to the Instruments hereby revoked and to Irish Standard 3217:2013 thereby prescribed, shall be construed, respectively, as references to this Instrument and to Irish Standard 3217:2013+A1:2017.

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Foreword

The aim of this Irish Standard is to promote a wider understanding of the different types of emergency lighting systems and modes of operation and to give guidance on their correct application, in accordance with legislation, Building Regulations and European standards, to the varied requirements of different categories of buildings.

The emergency lighting system is an integral part of the overall design of a building.

[A1] Amendments are indicated by the TAGs **[A1]** **[A1]** **[A1]**

This Standard has been prepared with the assistance of the National Standards Authority of Ireland Fire Safety Standards Committee, representation on which includes the following:

- Association of Consulting Engineers of Ireland;
- Office of Public Works (OPW);
- Institution of Fire Engineers (IFE);
- Electrical Contractors Association;
- Association of Electrical Contractors of Ireland;
- Electrical Manufacturers and Distributors Association of Ireland (EMDA);
- Emergency lighting manufacturers;
- Chief Fire Officers Association (CFOA);
- National Directorate for Fire and Emergency Management (NDFEM);
- Fire Industry Association of Ireland (FIAI);

[A1] **[A1]**

The requirements and recommendations contained in this Standard are intended to encourage uniformity of application in providing for the safety of persons in the event of failure of the supply to the normal lighting, having due regard to potential hazards and degree of familiarity of occupants with the building. This Standard recognizes that, in addition to ensuring safe unobstructed means of escape, emergency lighting is needed to assist in the immediate location and operation of fire alarm call points, refuge areas and firefighting equipment and to minimize panic. Emergency lighting is also required for areas where normal activities are required to continue substantially unchanged.

For wiring requirements refer to ET 101.

[A1] This document, I.S. 3217:2013+A1:2017 has been prepared by the NSAI FSSC Emergency Lighting Committee.

This document is an amendment to I.S. 3217:2013 – Emergency Lighting

There have been a number of revisions made with the main changes being made to Clause 10 *Central Powered Systems* and 8.5.2.2 *Lift cars and lift shafts*.

The final consolidated text, I.S. 3217:2013+A1:2017 will include a number of minor editorial corrections which are not detailed in this document.

The term "C.T.U." has been replaced by "test facility(s)" throughout the document.

IMPORTANT - For transition arrangements from I.S. 3217:1989 & I.S. 3217:2008 to I.S. 3217:2013+A1:2017, see Clause 4

Compliance with an Irish Standard does itself not confer immunity from legal obligations.

On publication this Standard updates and supersedes I.S. 3217:2013. [A1](#)

Introduction

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

For the purposes of this Standard, emergency lighting is regarded as a generic term of which there are a number of specific forms, as shown in Figure 1.

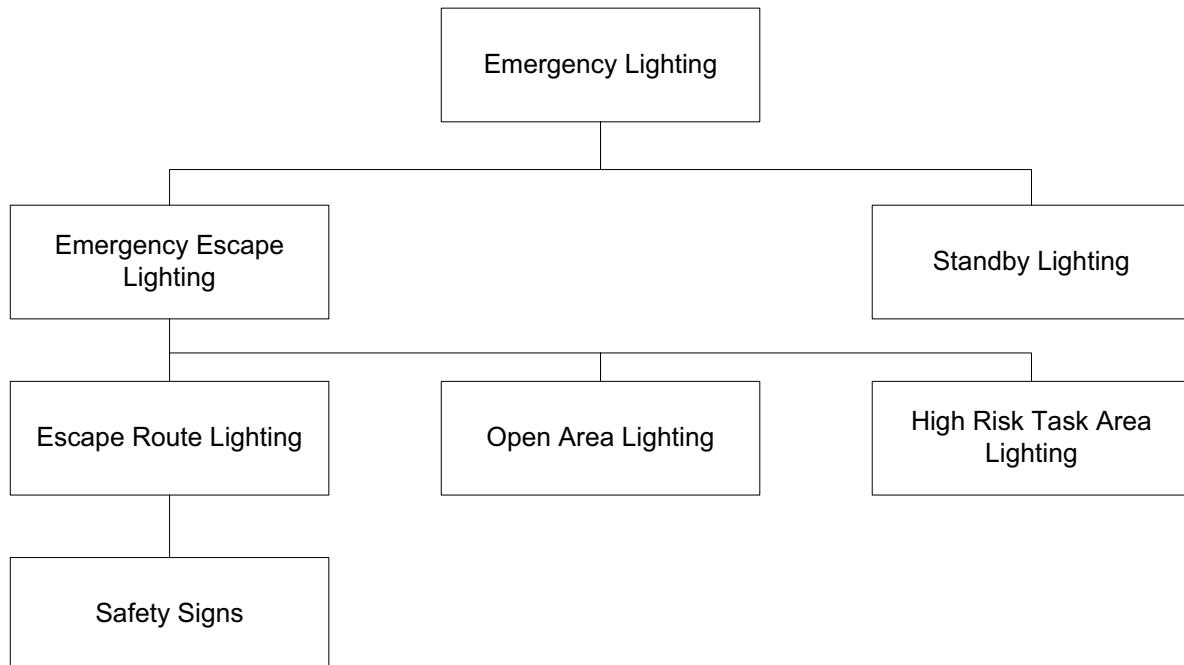


Figure 1 — Specific forms of emergency lighting

The requirements given in this Standard are a minimum for design purposes and calculations should be based on the minimum light-output condition of the luminaire. The flow of light for escape routes and open areas should be downward to the floor and illumination should be provided to any obstruction up to 2 m height above the floor. The contribution from room surface inter-reflections should be ignored.

The overall objective of emergency escape lighting is to enable safe exit from a location in the event of failure of the normal supply.

The objective of escape route lighting is to provide adequate visual conditions and directions for safe passage on escape routes and allow occupants to reach escape routes from open areas. It should allow fire alarm panels, call points, firefighting and safety equipment to be readily identified. It should allow hazards such as stairs, changes of direction, intersections, slopes and obstructions to be identified. It should provide adequate external illumination at final exits. If the immediate area outside the final exit has hazards in darkness then risk assessment should determine if further emergency luminaires are needed until a place of safety can be reached.

[A1] In areas or places where a continuous operation is required, during the failure of the supply to the normal lighting, then standby lighting should be installed. A standby lighting system should provide adequate illumination for the visual tasks. If standby lighting is used to provide emergency escape

lighting, the installation shall comply with the provisions of this standard and the appropriate product and wiring standards. A1

The objective of escape route safety signs (emergency exit signs) is to provide appropriate visual conditions and direction finding to allow escape routes to be readily located and used.

The objective of open area lighting is to reduce the likelihood of panic and to enable safe movement of occupants towards escape routes by providing appropriate visual conditions and direction finding.

The objective of high-risk task area lighting is to contribute to the safety of people involved in a potentially dangerous process or situation and to enable proper shut down procedures to be carried out for the safety of other occupants at the location.

People in work places should have received appropriate induction, be familiar with the layout of a building and its safety provisions and can effect an orderly evacuation in the event of an emergency. In large public places such as hotels, conference, shopping and sports centres there are likely to be large numbers of people who will be unfamiliar with the layout of the building and escape procedures.

Visual acuity varies considerably from person to person with regard to the amount of light required to perceive an object clearly and the time taken to adapt to changes in illuminance. The designer should, through risk assessment, take into account any special circumstances of the users of a building and determine if the level of illumination needs to be higher than the base standard. In general, older people need more light and take a longer time to adapt to low illuminance on a hazard or escape route. Where users have disabilities or visual impairments or where use of alcohol is likely, a higher level of illumination may be required.

There are techniques, including way-guidance systems, which can be applied to escape routes to enhance the effectiveness of a conventional emergency lighting system. These techniques are not included in this Standard.

Much anxiety and confusion can be alleviated by strategically placed signs indicating the way out of a location. It is very important that emergency exits are clearly indicated and visible at all material times.

Schedule

Ⓐ1 Emergency Lighting and Amendment 1:2017 Ⓛ1

1 Scope

The Standard gives requirements for the clear indication of escape routes, the minimum level of illumination and the minimum duration of operation for emergency escape lighting in the event of failure of supply to the normal lighting.

2 Normative references

This Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references subsequent amendments to or revisions of any of these publications apply to this Irish Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

Ⓐ1 Ⓛ1

I.S. EN 1838:2013, *Lighting Applications - Emergency Lighting*

Ⓐ1 I.S. EN 12665, *Light and Lighting - Basic Terms and Criteria for Specifying Lighting Requirements* Ⓛ1

I.S. EN 50091, *Uninterruptible Power Systems (ups) Part 1: General and Safety Requirements*

I.S. EN 13032-3, *Measurement and Presentation of Photometric Data of Lamps and Luminaires - Part 3: Presentation of Data for Emergency Lighting of Work Places*

I.S. EN 50171:2001, *Central Power Supply Systems*

I.S. EN 50172:2004, *Emergency Escape Lighting Systems*

Ⓐ1 I.S. EN 50200:2015 Ⓛ1, *Method of Test for Resistance to Fire of Unprotected Small Cables for Use in Emergency Circuits*

I.S. EN 50525-3-11, *Electric cables - Low voltage energy cables of rated voltages up to and including 450/750 V (U₀/U) - Part 3-11: Cables with special fire performance - Flexible cables with halogen-free thermoplastic insulation, and low emission of smoke*

I.S. EN 60529, *Degrees of Protection Provided by Enclosures (IP Code)*

Ⓐ1 I.S. EN 60598 -1:2015, *Luminaires – Part 1: General requirements and tests* Ⓛ1

I.S. EN 60598-2-22, *Luminaires - Part 2-22: Particular Requirements - Luminaires for Emergency Lighting*

I.S. EN 62034:2012, *Automatic Test Systems for Battery Powered Emergency Escape Lighting*

ET 101, *National Rules for Electrical Installations*

ET 105, *National Rules for Electrical Insulations in Potentially Explosive Atmospheres*

ISO 3864-1, *Graphical symbols - Safety colours and safety signs - Part 1: Design principles for safety signs and safety markings*

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

[A1] I.S. EN ISO 7010:2012+A5:2015 [A1], *Graphical symbols - Safety colours and safety signs - registered safety signs*

[A1] BS 8491:2008 [A1], *Method for assessment of fire integrity of large diameter power cables for use as components for smoke and heat control systems and certain other active fire safety systems*

[A1] [A1]

[A1] BS 8434-2:2003+A2:2009, *Methods of test for assessment of the fire integrity of electric cables. Test for unprotected small cables for use in emergency circuits. BS EN 50200 with a 930° flame and with water spray* [A1]

3 Terms and definitions

For the purpose of this Standard the following definitions apply:

access room

room which provides the only escape route from an inner room

automatic test system (ATS)

automated test system that may be manually initiated, consisting of parts (such as timers, current detectors, light detectors, changeover switches) which, when connected together, make a system that can carry out the routine testing requirements of emergency lighting luminaires, and indicate the test results

[Source: I.S. EN 62034]

ballast

unit connected between the supply and one or more discharge lamps which serves mainly to limit the current and voltage of the lamps to the required value

Note 1 to entry: For LED lamps this unit is referred to as a 'driver'.

battery

secondary cells provided as a source of supply for use when the normal supply fails

battery capacity

discharge capability of a secondary battery, being a product of average current and time, and expressed as ampere hours (Ah) at a stated discharge rate

battery charger

that part of the control unit which provides the charge to the emergency battery from the normal supply

[A1] **borrowed light**

light transmitted from one compartment to an adjacent compartment through a glazed section in an interior partition or door [A1]

building

any class or classes of structure or erection (whether temporary or permanent) or part of such structure or erection of any kind of material

car park

buildings or parts of buildings used as parking for cars and vehicles and including car/vehicle-parking areas, circulation areas, corridors, stairs and ancillary areas

car-parking area

designated open plan floor area on which vehicles are parked including driveways and open walkways

candela

luminous intensity in a given direction of a source that emits monochromatic radiation of a frequency of 540×10^{12} hertz and which has a radiant intensity in the same direction of 1/683 Watts per steradian

central battery emergency lighting system (CBS)

emergency lighting system which distributes an emergency electrical supply to a number of centrally supplied luminaires from a central battery which is normally kept in a charged state by its associated charger and control equipment

Note 1 to entry: The emergency supply may be a.c. or d.c. and is available either when the normal supply fails or at all material times (see I.S. EN 50171).

Note 2 to entry: There may be more than one central battery system within the same building.

central generator-powered emergency lighting system (CGPS)

emergency lighting system which distributes an emergency electrical supply to a number of centrally supplied luminaires from a prime mover driven electrical generator aided, where necessary, by a back-up battery system

central power supply system (CPS)

a central power supply system which supplies the required emergency power to essential safety equipment without any restriction in power output

centrally supplied luminaire

luminaire for maintained or non-maintained operation which is energised from an emergency power source that is not contained within the luminaire

Note 1 to entry: Sometimes referred to as a 'slave luminaire'.

combined (sustained) emergency luminaire

luminaire containing two or more lamps, at least one of which is energised from the emergency lighting supply and the other(s) from the normal lighting supply

[A1]

Note 1 to entry: A combined emergency luminaire is either maintained or non-maintained. Such a luminaire is intended to sustain illumination at all material times.

Note 2 to entry: **[A1]** In a combined non-maintained luminaire at least one of the lamps is energised only from the emergency lighting supply. In a combined maintained luminaire this lamp is also energised from the normal lighting supply.

competent person

person having regard to the task he or she is required to perform and taking account of the size or hazards (or both of them) of the undertaking or establishment in which he or she undertakes work, possessing sufficient training, experience and knowledge appropriate to the nature of the work to be undertaken

Note 1 to entry: For the purposes of the above account should be taken, as appropriate, of the framework of qualifications referred to in the Qualifications (Education and Training) Act 1999.

[Source: Safety, Health and Welfare at Work Act 2005]

defined escape routes

routes, such as   escape corridors and escape stairways, through which or along which, persons may be required to travel to reach a final exit from a building

deviation

an element of an installation that fails to meet the requirements of the standard

emergency lighting

lighting provided for use when the supply to the normal lighting fails. Emergency lighting includes emergency escape lighting and standby lighting

emergency lighting system

complete but discrete emergency lighting installation from the standby power source(s) to the emergency lighting lamp(s). The system may consist of self-contained emergency luminaires or a circuit(s) supplied from a central power system connected through wiring to slave emergency luminaires

emergency exit

way out that is intended to be used during an emergency

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 leaving

escape route

route designated for escape in the event of an emergency

[Source: I.S. EN 1838:2013]

escape route lighting

that part of emergency escape lighting provided to ensure that the means of escape can be effectively identified and safely used when the location is occupied

[Source: I.S. EN 1838:2013]

externally illuminated emergency exit sign

emergency exit sign that is illuminated, when it is required, by an external source

final exit

termination of an escape route from a building giving direct access to a street, passageway, walkway or open space, and sited to ensure the rapid dispersal of persons from the vicinity of a building so that they are no longer in danger from fire and/or smoke

functional test

test to check the integrity of the circuit and the correct operation of a lamp, a changeover device and battery emergency power supply

[Source: I.S. EN 62034]

habitable room

room used for living or sleeping purposes or a kitchen having a floor area greater than 6,5 m²

Note 1 to entry: Bathrooms, toilets or shower rooms are not considered habitable rooms.

high risk task area lighting

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 building

illuminance

at a point of a surface, the luminous flux incident on an element of the surface divided by the area of that element, i.e. the luminous flux density at a surface, that is, the luminous flux incident per unit area. Unit: lux (lx) = lumen per square metre

inner room

room from which escape is possible only by passing through an access room

input voltage

voltage applied to a luminaire

internally illuminated emergency exit sign

emergency exit sign made of translucent materials which is illuminated by an integral light source so as to give the appearance of a luminous surface

Note 1 to entry: An edge-lit emergency exit sign, where light from an enclosed source is directed through a transparent plate onto which the legend has been printed/etched or engraved in order to generate a luminous surface and which complies with the requirements of I.S. EN 1838:2013, is considered to be an internally illuminated exit sign.

inverter

device for conversion of d.c. to a.c.

justifiable variation

an alternative engineering solution to meet the intent of the standard

low power supply system (LPS)

a central power supply system with a limitation of the power output of the system at 500 W for 3 h or 1500 W for 1 h duration

luminaire

apparatus which distributes, filters or transforms the light transmitted from one or more lamps and which includes all the parts necessary for supporting, fixing and protecting the lamps, but not the lamps themselves, and which includes where necessary circuit auxiliaries together with the means for connecting them to the supply

luminance

at a point of a surface and in a given direction, the luminous intensity of an element of the surface, divided by the area of the orthogonal projection of this element on a plane perpendicular to the given direction. Unit, candela per square metre (cd/m²)

A1) luminous flux

total visible radiant energy per unit time emitted by a source or received by a surface

Note 1 to entry: Unit: lumen (lm) A1

luminous intensity

luminous flux emitted by the source in an infinitesimal cone containing the given direction, divided by the solid angle of that cone. Unit, candela (cd)

maintained emergency luminaire

luminaire in which the emergency lighting lamp(s) are in operation at all material times

Note 1 to entry: A maintained emergency luminaire may operate continuously or be "switched-maintained" whereby the lamp(s) operate when the normal lighting is switched on. When the supply to the normal lighting fails the designated emergency lamp(s) will operate.

material times

times during which a building is occupied

mounting height

vertical distance between the underside of a luminaire or base of a sign, and the floor

nominal battery voltage

nominal voltage of a battery as declared by the manufacturer

non-maintained emergency luminaire

luminaire in which the emergency lighting lamps are in operation only when the supply to the normal lighting fails

normal lighting

A1 A1 installed artificial lighting, operating from the normal supply, intended for use when there is insufficient daylight available

normal supply

electricity supply taken from the Electricity Supply Authority or alternatively from the proprietor's own generating plant

normal supply failure

condition in which the normal lighting can no longer provide a minimum illuminance for emergency escape purposes or to enable proper shut down procedures to be carried out for the safety of other persons and when the emergency lighting should become operative

open area (undefined escape route)

areas of undefined escape routes in halls or buildings greater than 60 m² floor area or smaller areas if there is additional hazards such as use by a large number of people

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, i.e. an area greater than 60 m² where special considerations apply. See **open area (undefined escape route)**

Note 1 to entry: In some countries this is known as anti-panic lighting.

photo-luminescent exit sign

non-electrically powered sign incorporating phosphors, that if excited by electromagnetic radiation, store energy which is emitted as visible light over a period of time

place of safety

a place, normally in the open air at ground level, in which persons are in no danger from fire

rated duration

period of time, as claimed by the manufacturer, that the rated emergency lumen output is provided

refuge area

area that is enclosed with fire-resisting construction (other than any part that is an external wall of a building) and served directly by a safe route to a storey exit, evacuation lift or final exit, thus constituting a temporarily safe space for disabled people to await assistance for their evacuation

response time

time between failure of the normal lighting and emergency lighting reaching the required level of illuminance

safety sign

sign which gives a general safety message, obtained by a combination of colour and geometric shape and which, by the addition of a graphical symbol gives a particular safety message

[Source: ISO 17724:2003]

Note 1 to entry: An emergency exit sign is a safety sign that uses only graphic symbols (see Annex B).

safety colour

colour to which a specific meaning is assigned

Note 1 to entry: See also the S.I. 299 Safety Health & Welfare at Work (General Applications) Regulations.

self-contained emergency luminaire

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

Note 1 to entry: Sometimes referred to as a 'single-point' luminaire.

slave luminaire

see **centrally supplied luminaire** A1

A1 spill light

light entering a compartment or lobby from an adjacent compartment through an open door A1

standby lighting

that part of emergency lighting provided to enable normal activities to continue substantially unchanged in the event the supply to the normal lighting fails

static inverter unit (SIU)

a unit supplied from a central battery, normally kept in a charged state by its associated charger and control equipment, incorporating a d.c. to a.c. Inverter, Phase Failure Monitor, Automatic Transfer Device and associated controls, compliant to I.S. EN 50171

Note 1 to entry: An S.I.U. provides an a.c. output to dedicated a.c. slave luminaires at mains potential either when the normal supply fails or at all material times.

sustained emergency luminaire

see **combined (sustained) emergency luminaire**

temporary accommodation units (TAU's)

buildings of a temporary nature which may include for example prefabricated cabins, cargo containers, portable or sectional buildings, marquees, tents etc.

un-defined escape routes

open areas in a building where the escape routes are not fixed or defined by the elements of construction

uniformity 'U_o'

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

working plane

horizontal calculation plane situated at the nominal working height in an interior space

Note 1 to entry: For emergency lighting purposes throughout this Standard the working plane height A_1 is normally taken A_1 as floor or ground level, except for High Risk Task Areas and at specific locations indicated in this Standard when the reference plane of the visual task shall be used.

4 Transition arrangements from I.S. 3217:1989 and I.S. 3217:2008 to [A1] I.S. 3217:2013+A1:2017 [A1]

I.S. 3217:1989 was a code of practice issued in 1989 and superseded by issue of Standard I.S. 3217:2008 on the 7th November 2008.

Because of the duration of building projects any Emergency Lighting System designed in accordance with I.S. 3217:1989 or I.S. 3217:2008 for which a Fire Safety Certificate under the Building Control Regulations has been granted, may proceed to completion but all reasonably practicable steps should be taken to bring such systems into conformity with [A1] I.S. 3217:2013+A1:2017. [A1]

A note on all system certification documents stating that the design and installation is in accordance with I.S. 3217:1989 or I.S. 3217:2008 must be included.

All variations from the Standard, for which a Fire Safety Certificate under the Building Control Regulations has been granted, shall be recorded on the system certification documents (see Annex C1 to Annex C4).

Emergency lighting systems (whether new installations, extension/alterations or modifications to existing installations) shall be commissioned to [A1] I.S. 3217:2013+A1:2017 [A1]. In addition, the areas covered in any new installation or any system extension/alteration or modification shall be designed and installed to [A1] I.S. 3217:2013+A1:2017 [A1].

User responsibilities for all emergency lighting systems shall be in accordance with [A1] I.S. 3217:2013+A1:2017 [A1].

Servicing and Maintenance for all emergency lighting systems shall be in accordance with [A1] I.S. 3217:2013+A1:2017 [A1].

There is no requirement for an emergency lighting system designed, installed and commissioned to a previous version of I.S. 3217 to be upgraded in whole or in part to the latest version of the Standard unless:

- the owner [A1] decides to upgrade the system to I.S. 3217: 2013+A1:2017 or, [A1]
- the existing installation cannot be incorporated in a new system and would detrimentally affect either its operation or the effective operation of the new upgrade or,
- an upgrade is required by a Fire Safety Certificate under the Building Control Regulations for material alteration, extension or change of use of the building.

5 Description of emergency lighting systems

5.1 General

This standard covers both temporary and permanently installed electrically powered emergency lighting systems of the following system types:

- a) self-contained,
- b) central powered, using centrally supplied luminaires,
- c) central generator-powered.

To ensure that emergency escape lighting operates when required, it shall be installed, tested and maintained in accordance with this Standard and I.S. EN 60598-2-22, I.S. EN 50172, I.S. EN 62034 and ET101.

Where power is provided to a building by a generator only, this shall be considered the mains supply to the building and therefore the building requires emergency lighting.

The only power sources considered suitable for emergency lighting are therefore combinations of rechargeable secondary batteries together with suitable chargers as in a), b), or prime mover driven electrical generators as in c).

For each type of system there are three principal modes of operation; maintained, non-maintained or combined.

5.2 Self-contained luminaire systems

In a self-contained system all of the elements of the luminaire, such as the battery, the lamp, the control unit and any monitoring facilities, are contained within the luminaire. Alternatively, selected elements such as control gear and battery may be remotely located. Where the connecting power cabling is greater than 1 m in length, this cabling shall meet the requirement of [A1](#) 9.2 [A1](#).

5.3 Central power systems (CPS)

5.3.1 Central battery system (CBS)

A CBS is an emergency lighting system, compliant to I.S. EN 50171, which distributes an emergency electrical supply from a central battery unit (CBU), via a fire, water resistant and mechanically protected distribution system, to a number of centrally supplied luminaires. This type of system provides an emergency lighting supply source upon failure of the normal supply (non-maintained system) or an emergency lighting supply source at all material times (maintained or combined system).

The emergency supply from a central battery system may be a.c. or d.c. at a range of potentials from 12 V to 230 V a.c. or d.c. [A1](#) [A1](#)

All isolators and/or protective devices (not including fuses), within the central battery distribution system shall be of multi-pole ganged type.

5.3.2 Static inverter system (SIS)

A SIS is an emergency lighting system, compliant to I.S. EN 50171, which distributes an emergency electrical supply from a static inverter unit (SIU), via a fire, water resistant and mechanically protected distribution system, to a number of centrally supplied slave luminaries.

This type of system provides an emergency lighting supply source upon normal supply failure (non-maintained) or an emergency lighting supply source at all material times (maintained or combined).

The emergency supply from a static inverter system is normally a.c. at mains voltage potential.

All isolators and/or protective devices (not including fuses) within a static inverter distribution system shall be of four pole type in the case of three phase supplies and of double pole for single phase supplies.

5.3.3 Uninterruptible Power Supply (UPS)

A UPS is a form of a.c. inverter which continues to supply an emergency output without a break during normal supply failure. UPS systems which comply with I.S. EN 50091 shall also comply with I.S. EN 50171 when used for emergency lighting applications. Due to the particular requirements of I.S. EN 50171, with regard to load starting, overload/short-circuit capability and battery charge characteristics, conventional UPS systems are unsuitable for emergency lighting applications.

5.4 Central generator-powered systems (CGPS)

A central generating system shall be of the mains-failure automatic-start type. Generating systems that are not capable of being placed on load within 5 s shall be supplemented by a battery system to provide sufficient power to operate the emergency lighting system A_1 until the generator is capable of taking the load. Once the generator is capable of taking the load the load shall be transferred from the battery system to the generator. A_1

The generator and the battery back-up system shall be connected to the same mains failure sensor so that on mains failure the generator shall automatically go into its start sequence while full emergency lighting cover is provided immediately by the battery. The battery shall automatically disconnect when the generator has reached the rated output, and shall begin to recharge from the generator or from the normal supply when that is restored.

NOTE This Standard does not require a separate generator to serve A_1 only the emergency lighting system A_1 unless it is deemed necessary by the designer.

6 Need for emergency lighting

6.1 General

When the supply to the normal lighting of a building fails, emergency lighting shall be provided. Throughout this Standard reference to 'emergency lighting' covers 'emergency escape lighting' in particular, but also includes any element of standby lighting which may be used for emergency escape lighting.

6.2 Emergency escape lighting

When the supply to the normal lighting to an occupied building, or parts thereof fails, emergency escape lighting shall be provided to:

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

Emergency escape lighting shall operate, in the event of failure of any part of the normal lighting supply. Arrangements shall be made to ensure that local emergency escape lighting will operate in the event of failure of the normal supply to the corresponding local circuit.

Emergency escape lighting is not designed to allow normal operations to be continued in the building in the event of failure of the normal lighting.

6.3 Standby lighting

For areas where normal activities are required to continue substantially unchanged, in the event the supply to the normal lighting fails, standby lighting shall be installed to meet some suitable proportion of the standard service illuminance required for that task.

In some situations, this may require providing 100% service illuminance.

7 Emergency escape lighting

7.1 General

The requirements given in this Standard are maintained minimum values and are calculated for the full rated duration period at the end of design life of the equipment. The room surface inter-reflections light contribution shall be ignored.

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

NOTE In building design any potentially serious obstructions or hazards on an escape route should be light in colour with contrasting surround. Where the building design departs from the above, the designer may have to compensate with additional and appropriately positioned luminaires.

Escape routes shall be kept clear of unnecessary obstructions at all times.

7.2 Escape route lighting

7.2.1 Defined escape routes

For escape routes up to 2 m in width, the horizontal illuminance on the floor along the centre line of an escape route shall be not less than 1 lux and the central band consisting of not less than half of the width of the route shall be illuminated to a minimum of 50 % of that value (see Figure 2).

Wider escape routes can be treated as a number of 2 m wide strips or be provided with open area (anti-panic) lighting (see Figure 3, Figure 4 and Figure 5).

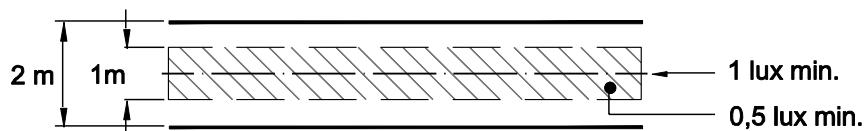


Figure 2 — 2 m wide defined escape route

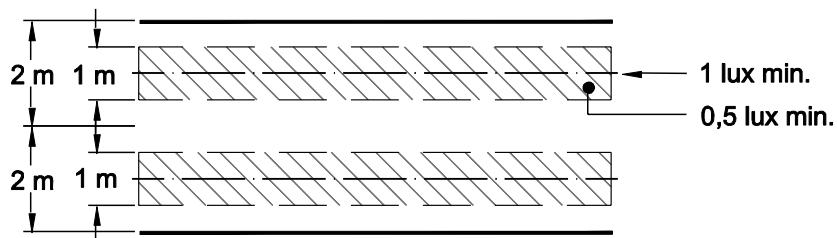


Figure 3 — 4 m wide defined escape route treated as two 2 m wide strips

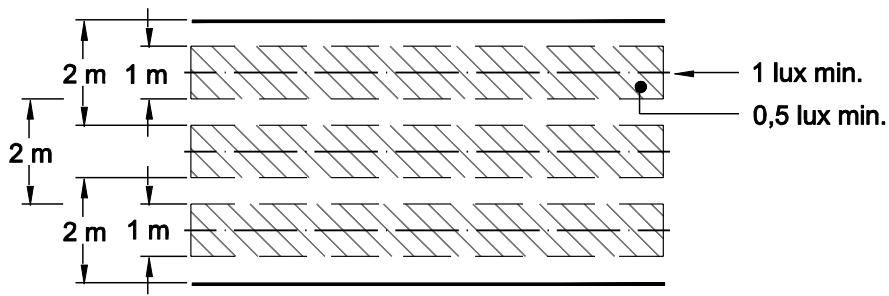


Figure 4 — 5m wide defined escape route treated as three 2 m wide overlapping strips

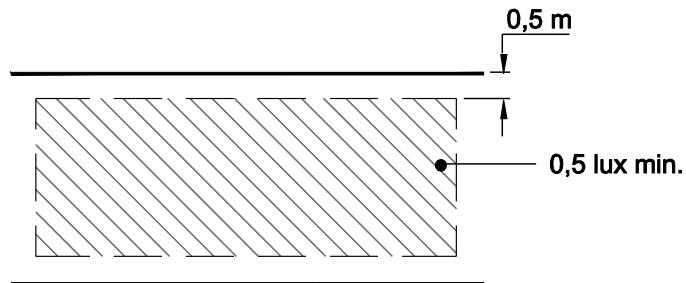


Figure 5 — \square Example of defined escape route >2m being provided with open area lighting \square

7.2.2 Undefined escape routes

The horizontal illuminance shall be not less than 0,5 lux at the floor level of the empty core area which excludes a border of 0,5 m of the perimeter of the area (see Figure 6).

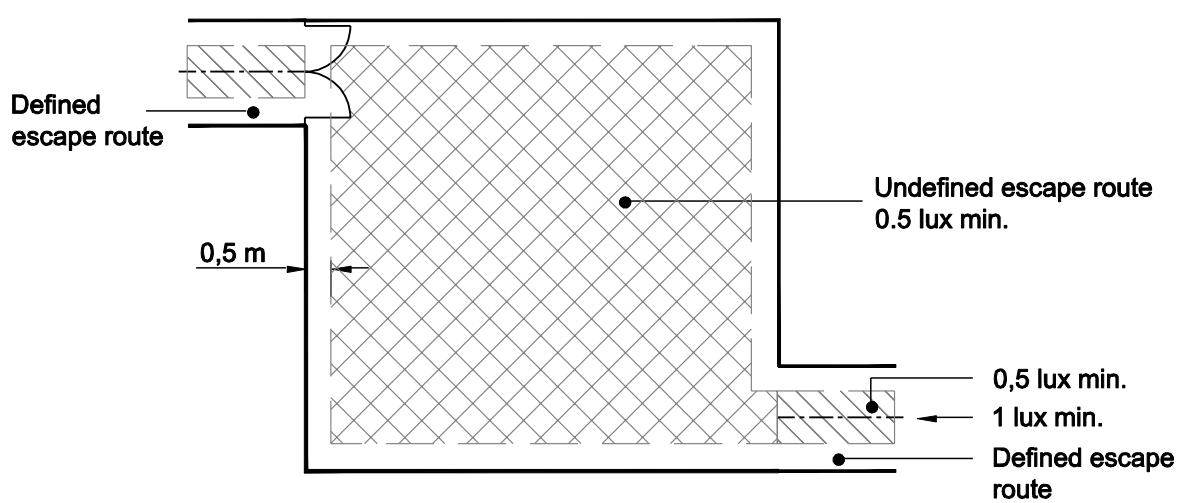


Figure 6 — Undefined escape route treated as open area

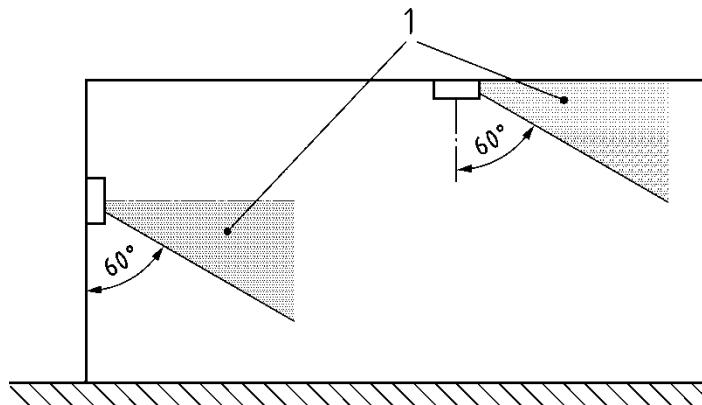
7.2.3 Diversity of illuminance U_d

The extreme ratio ' U_d ' of the minimum to the maximum illuminance (according to I.S. EN 12665) shall not be less than 1:40 along the centre line of the escape route.

7.2.4 Glare

7.2.4.1. Disability glare shall be contained to an acceptable level by limiting the luminous intensity of the luminaires within the field of view (see Table 1).

7.2.4.2. For level horizontal escape routes the luminous intensity of the luminaires shall not exceed the values in Table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth (see Figure 7).

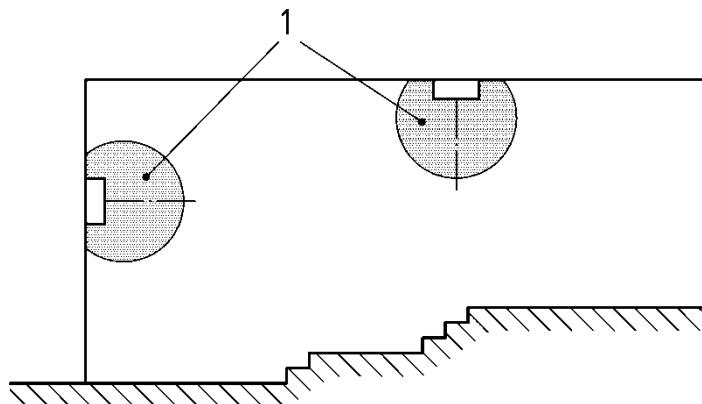


Key

1 Area where the maximum luminous intensity shall not exceed the values of Table 1

Figure 7 — Glare zone for horizontal escape routes

7.2.4.3. For all other escape routes and areas, the limiting values shall not be exceeded at all angles (see Figure 8).



Key

1 Area where the maximum luminous intensity shall not exceed the values of Table 1.

Figure 8 — Glare zone for all other escape routes

NOTE High contrast between a luminaire and its background can produce glare. For escape route lighting the main issue will be disability glare, in which the brightness of the luminaires can dazzle and prevent obstructions or signs being seen.

Table 1 — Disability glare limits

Mounting height above floor level, h m	Escape route and open area (anti-panic) lighting maximum luminous intensity, Imax cd	High risk task area lighting maximum luminous intensity, Imax cd
h < 2,5	500	1 000
2,5 ≤ h < 3,0	900	1 800
3,0 ≤ h < 3,5	1 600	3 200
3,5 ≤ h < 4,0	2 500	5 000
4,0 ≤ h < 4,5	3 500	7 000
h ≥ 4,5	5 000	10 000

7.2.5 Colour rendering index Ra

In order to identify safety colours the minimum value for the colour rendering index *Ra* from a light source shall be 40. The luminaire shall not substantially subtract from this.

7.2.6 Response time

The emergency lighting shall reach 50 % of the required illuminance level within 5 s and full required illuminance within 60 s.

NOTE Where emergency lighting is required in an area that is exclusively illuminated by means of high intensity discharge (HID) lighting with excessive run up or re-strike times, the designer should ensure that appropriate levels of illumination are provided, upon the restoration of the supply to the normal lighting, until an adequate level of illumination is provided by the HID lighting.

7.2.7 Compliance with 7.2.1 to **7.2.6** can be checked by measurement or by comparison with authenticated data.

7.3 Open area (anti-panic) lighting

7.3.1 The horizontal illuminance shall be not less than 0,5 lx at the floor level of the empty core area which excludes a border of 0,5 m of the perimeter of the area.

7.3.2 The diversity, ' U_d ', ratio of the minimum to the maximum illuminance (according to I.S. EN 12665) shall not be less than 1:40.

7.3.3 Disability glare shall be kept low by limiting the luminous intensity of the luminaires within the field of view. These shall not exceed the values in Table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth (see Figure 7).

7.3.4 In order to identify safety colours the minimum value for the colour rendering index *Ra* from a light source shall be 40. The luminaire shall not substantially subtract from this.

7.3.5 The anti-panic area lighting shall reach 50 % of the required illuminance within 5 s and full required illuminance within 60 s.

7.3.6 Compliance with 7.3.1 to 7.3.5 can be checked by measurement or by comparison with authenticated data.

7.4 High risk task area lighting

7.4.1 In areas of high risk, the maintained illuminance on the task area plane shall be not less than 10 % of the required maintained illuminance for that task, however, it shall be not less than 15 lx. It shall be free of harmful stroboscopic effects.

7.4.2 The uniformity ' U_o ' of the high risk task area lighting illuminance shall be not less than 0,1.

7.4.3 Disability glare shall be kept low by limiting luminous intensity of the luminaires within the field of view. These shall not exceed the values in Table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth.

7.4.4 In order to identify safety colours, the minimum value for the colour rendering index Ra from a light source shall be 40. The luminaire shall not substantially subtract from this.

7.4.5 The minimum duration shall be the rated duration of the system and the period for which the risk exists to people.

7.4.6 High risk task area lighting shall provide the full required illuminance permanently or within 0,5 s depending upon application.

7.4.7 Compliance with 7.4.1 to 7.4.4 and 7.4.6 can be checked by measurement or by comparison with authenticated data.

7.5 Standby lighting

When standby lighting is used for emergency escape lighting purposes it shall conform to the relevant requirements of this Standard.

Where a standby lighting level lower than the minimum normal lighting is employed, the lighting is to be used only to shut down or terminate processes.

NOTE The level of service illuminance required should be determined through a risk assessment by the designer in consultation with the end user.

8 Emergency lighting design requirements

8.1 General

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

The emergency lighting system shall be designed so that operational testing of the system (see 9.3 and 10.5.2) can be carried out without interrupting the normal supply.

Emergency escape lighting shall operate, in the event of failure of any part of the normal lighting supply. Arrangements shall be made to ensure that local emergency escape lighting will operate in the event of failure of the normal supply to the corresponding local circuit.

NOTE 1 Where local circuit monitoring devices are used, these should be compliant to the changeover requirements of I.S. EN 60598-2-22 and I.S. EN 50171.

NOTE 2 For self-contained and non-maintained central battery systems where the supply to the local emergency escape lighting is not derived from the corresponding 'normal' lighting circuit(s), the use of local circuit monitoring should be limited to the local area and the corresponding circuit(s). This is to avoid the monitoring of an excessive number of circuits across different areas which would compromise the integrity of the system. The risk of unintended discharge of the system can be mitigated through the use of remote alarm indication.

8.2 System integrity

The illumination by the emergency escape lighting system of a compartment of the escape route shall be from two or more luminaires so that the failure of one luminaire does not plunge the route into total darkness or make the directional finding effect of the system ineffective. For the same reason, two or more luminaires shall be used in each open area (anti-panic).

NOTE 1 It is not normally possible to cater for an interruption of the normal lighting due solely to the failure of an individual lamp. Consideration should therefore be given to methods of eliminating any probable hazard which might arise due to the failure of this lamp.

NOTE 2 The term "compartment" is that part of the escape route reliant on illumination located within it. This term is not used in the same context of fire compartmentation as required by the Building Regulations.

NOTE 3 The provision of an internally illuminated exit sign may contribute to meeting the requirements of 8.2 for compartments not greater than 6 m² floor area.

8.3 Failure of an emergency lighting luminaire

The failure of any one luminaire connected to a circuit shall not affect other luminaires connected to the same circuit.

This requirement can be satisfied by means of a fuse, relay or other protective device incorporated in each luminaire, or by protection against excessive fault currents being inherent in the design of the luminaire circuitry/components.

It is recommended that luminaires re-engineered for self-contained emergency operation have a fuse, relay or other protective device on both switched and un-switched mains supplies.

8.4 Mounting height of luminaires

The mounting height of the individual luminaires will usually be governed by the physical characteristics of the area under consideration. The luminaires shall be mounted at least 2 m above the floor level.

However, there may be exceptional circumstances where a 2 m mounting height is not possible such as crawl spaces in plant areas and passageways in historic buildings. A more considered risk-assessed approach shall be taken in such circumstances.

NOTE Luminaires should be mounted below smoke reservoirs where they are provided.

8.5 Siting of emergency escape lighting luminaires

8.5.1 Points of emphasis

The points of emphasis when placing emergency luminaires are:

- a) near (see NOTE 3) each emergency exit door,
- b) near stairs so that each flight of stairs receives direct light,
- c) near any other change in level,
- d) externally illuminated escape route safety signs, escape route direction signs and other safety signs needing to be illuminated under emergency lighting conditions,
- e) at each change of direction,
- f) at each intersection of corridors,
- g) near to each final exit and outside the building to a place of safety. A1 If the immediate area outside the final exit has hazards in darkness then a risk assessment should determine if further emergency luminaires are needed until a place of safety can be reached, A1
- h) near each first aid post, so that 5 lux vertical illuminance is provided at the first aid box,
- i) near each piece of firefighting equipment, fire alarm panel and call point to provide 5 lux vertical illuminance,
- j) near escape equipment provided for the disabled,
- k) near disabled refuges, disabled refuge panel and call point. Also to include disabled refuge two way communication systems including disabled toilet alarm call position.

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

NOTE 2 For points e) and f), "at" means that the emergency luminaire would illuminate in both directions at the change of direction or intersection.

NOTE 3 For the purpose of this clause emergency exit doors are classified as doors that are located on the escape route and/or require an emergency exit sign to be installed to indicate the direction of escape.

NOTE 4 Emergency luminaires used to meet the requirements of h), i), j) and k) may be mounted lower than 2 m above floor level.

NOTE 5 Where the illumination of specific safety equipment, as detailed in items h) and i) is required, all efforts should be made, at the design stage, to ascertain where this equipment will be located. If decisions on locating the equipment in h) and i) are not made, then consultation with the relevant authorities/persons concerned should take place to ascertain the locations, in order that the correct minimum illumination (5 lux) is achieved at each point. Should the positions be altered, or any additional equipment be installed, it will be the persons having responsibility for the building that should ensure the minimum levels of illuminance are met at each of the additional points.

8.5.2 Other locations

In addition to 8.5.1 emergency escape lighting shall be installed in the following locations.

NOTE See [A1](#) Annex E2 [A1](#) for an example of rooms that require emergency escape lighting.

8.5.2.1 External areas in the immediate vicinity of exits

To assist dispersal to a place of safety, the external areas in the immediate vicinity of final exits [A1](#) shall [A1](#) be illuminated in accordance with the illumination level for escape routes.

8.5.2.2 Lift cars and lift shafts

[A1](#) For passenger lifts and goods passenger lifts, emergency lighting shall be installed which is capable of providing at least 5 lux for the rated duration;

- at each alarm initiation device in the car and on the car roof;
- in the centre of the car 1 m above the floor;
- in the centre of the car roof, 1 m above the floor.

Emergency lighting shall also be provided in the lift pit. The horizontal illuminance shall not be less than 1 lux at floor level.

Any luminaire connected to the main emergency lighting supply that is necessary in a lift car shall be on a separate circuit and shall be connected to an appropriate test facility (see 9.3 and 10.5.2).

Lifts cannot be considered as part of an escape route except in special circumstances and then only when they are fitted with their own emergency operating power supply. In such circumstances the illumination of a lift car shall meet the requirements of 8.2

NOTE 1 Due to the location of the emergency lighting luminaires in the lift shaft and on top of the lift car, it is recommended that the emergency escape lighting installed in these locations is connected to an appropriate Automatic Test System (ATS).

NOTE 2 Emergency lighting should be maintained by competent persons with appropriate training or under the supervision of those with appropriate training to work in these locations.

NOTE 3 A goods passenger lift is mainly intended for the transport of goods, which are generally accompanied by persons (see I.S. EN 81-20:2014). [A1](#)

8.5.2.3 Moving stairways and walkways

In order to safely exit from moving stairways and walkways to an escape route, emergency escape lighting shall be provided so that the horizontal illuminance at floor level along the centre line of the moving stairway or walkway shall be not less than 1 lux.

8.5.2.4 Toilet facilities

Toilet facilities exceeding 8 m² gross floor area, and facilities less than 8 m² without borrowed light, shall be provided with emergency escape lighting. The horizontal illuminance shall not be less than 0,5 lux at floor level.

An emergency exit sign shall be provided where the emergency exit is not conspicuous or where confusion could occur.

Disabled toilets shall be provided with emergency escape lighting. The horizontal illuminance shall not be less than 1 lux at floor level. Disabled cubicle(s) within toilet facilities shall have a minimum horizontal illumination of 1 lux.

Shower cubicle(s) within toilet facilities shall have a minimum horizontal illumination of 1 lux.

The ratio of minimum to maximum illuminance shall not be less than 1:40.

Toilet lobbies shall be provided with emergency escape lighting to the levels required for escape routes.

Refer to Annex E1 for typical arrangements of emergency escape lighting for toilet areas.

NOTE 1 The gross floor area of a toilet is that area bounded by the inner surfaces of the enclosing walls including the space occupied by any toilet and/or shower cubicle(s) and wash hand basin(s) within the area being measured.

NOTE 2 This clause does not necessitate the provision of emergency lighting in a single occupancy toilet for use by an able-bodied person. However, single occupancy toilets with baby changing facilities should be provided with emergency escape lighting with a minimum horizontal illumination of 1 lux.

NOTE 3 For toilet lobbies less than 6 m² floor area, borrowed light and/or light from an internally illuminated emergency exit sign may contribute to meeting the system integrity requirements of 8.2. An emergency exit sign A1 should A1 be provided where the emergency exit is not conspicuous or where confusion could occur.

NOTE 4 For toilet lobbies less than 2 m² floor area, spill light from an adjacent compartment through an open door, available when transiting the lobby, may contribute to meeting the system integrity requirements of 8.2.

NOTE 5 For the purposes of 8.5.2.4 borrowed light is emergency light transmitted, from one compartment to an adjacent compartment, through a glazed section in an interior partition or door. In the case of toilets, borrowed light should come directly from an adjacent compartment i.e., not through a lobby. In the case of lobbies, borrowed light should come directly from the escape corridor and not solely from the toilet area due to the fact that lobby lighting is normally supplied from the same circuit as the toilet area.

In the case of local circuit failure in toilets/lobbies, the normal lighting in the escape corridor would contribute (if activated) to borrowed or spill light. For this reason, the designer should take cognisance of any presence detection control of the normal lighting in the escape corridor.

NOTE 6 For the purpose of 8.5.2.4, a single occupancy toilet for use by an able-bodied person is not considered an **inner room** (see definition).

8.5.2.5 Motor generator, control, switch and plant rooms

Emergency lighting shall be provided in all motor generator rooms, control rooms, switch rooms, plant rooms and adjacent to main control equipment associated with the provision of normal and emergency lighting to the building. The horizontal illuminance shall be not less than 1 lux at the floor level. The illuminance on main control equipment and switchboards A1 associated with the provision of normal and emergency lighting to the building A1 shall be not less than 5 lux in the plane of the visual task.

NOTE Emergency lighting serving areas where rotating parts of machinery or rotating tools are present shall be non-stroboscopic.

8.5.2.6 **Covered car parks**

The defined pedestrian escape routes within covered and/or multi-storey car park/car parking areas shall be easily identifiable and shall be provided with escape route lighting.

8.5.2.7 **Open area (anti-panic) lighting**

The objective of open area (anti-panic) lighting is to reduce the likelihood of panic and to enable safe movement of occupants towards escape routes by providing appropriate visual conditions and direction finding. It is used in areas of undefined escape routes in halls or buildings larger than 60 m² floor area or smaller areas if there is additional hazard such as use by a large number of people.

Ⓐ Rooms larger than 60 m² floor area, or those having been risk assessed as needing emergency lighting, shall be provided with horizontal illuminance of not less than 0,5 lux at the floor level of the area, excluding a border of 0,5 m around the perimeter. Ⓛ

8.5.2.8 **Refuge areas**

A minimum illuminance of 5 lux is required at a refuge call point and in the area for the transfer of people to evacuation devices.

8.5.2.9 **High risk task area lighting**

In areas of high risk the maintained illuminance on the task area plane shall not be less than 10 % of the required maintained illuminance for that task, and it shall not be less than 15 lux. The emergency lighting shall be non-stroboscopic.

The uniformity 'U_o' of the high risk task area lighting illuminance shall be not less than 0,1.

Disability glare shall be kept low by limiting the luminous intensity of the luminaires within the field of view. These shall not exceed the values in Table 1 within the zone 60° to 90° from the downward vertical at all angles of azimuth.

In order to identify safety colours, the minimum value for the colour rendering index Ra of a lamp shall be 40. The luminaire shall not substantially subtract from this.

The minimum duration shall be the rated duration of the system.

High risk task area lighting shall provide the full required emergency illuminance permanently or within 0,5 s depending upon application.

Compliance can be checked by measurement or by comparison with authenticated design data.

8.5.2.10 **External roof mounted plant or roof plant rooms**

For buildings that have external roof mounted plant or roof plant rooms that require regular access (e.g. for maintenance), then in such circumstances where the roof area is extensive and/or particular hazards exist in relation to escape, emergency escape lighting shall be provided to allow for the safe egress of persons from the roof.

NOTE The requirements of 8.4 do not apply to this sub clause.

8.6 Emergency exit signs

8.6.1 General

Emergency exit signs for emergency escape lighting systems are subject to the statutory and general requirements as outlined in Annex B.

Please refer to Annex B for the types emergency exit signs to be used.

A detailed design and specification for emergency exit signage should take into account the following:

- a) the use of the building,
- b) the legislation applicable to the building and the requirements (if any) of enforcing authorities,
- c) the operational needs of the building manager(s) for example with regard to public access and security provisions,
- d) the evacuation strategy for the building,
- e) the degree of familiarity of the occupants with the building.

8.6.2 Location of emergency exit signs

Emergency exit signs, either internally illuminated or externally illuminated, shall be positioned at final exits and where necessary along escape routes, A1 A1 to indicate the direction to the next emergency exit, refuge area or assembly point. Where direct sight of a final exit is not possible, a series of emergency exit signs shall be placed along the escape route to assist progression towards the final exit.

When positioning emergency exit signs the following principles shall apply:

- a) at least one escape route or doorway leading to an escape route should be visible from any point within every room or enclosure. Where this route is not conspicuous or confusion could occur, the route shall be indicated by an emergency exit sign,
- b) where direct sight of the escape route or of the emergency exit sign indicating the escape route is obstructed, one or more intermediate emergency exit signs shall be provided,

A1 NOTE 1 A1 For buildings that have external roof mounted plant or roof plant rooms that require regular access (e.g. for maintenance), then in such circumstances it is recommended that where confusion could occur as to the direction of escape from the roof, emergency exit sign(s) should be installed.

- c) emergency exit signs A1 shall A1 take precedence over all other signs,
- d) all changes of direction in corridors, stairways and open spaces forming part of an escape route shall be marked with intermediate emergency exit signs. Each intermediate door or junction should be similarly signed,

A1 NOTE 2 A1 Persons escaping along any designated escape route should have an emergency exit sign in sight whenever a choice of direction or door has to be made.

A1 NOTE 3 A1 In buildings that contain open areas where high shelving is used e.g. supermarkets, warehouses, storage units etc. emergency exit signs are not required to be visible by a person in an aisle formed by the shelving unless it is deemed necessary by the emergency lighting designer or is a requirement elsewhere in this Standard. Emergency exit signs should be visible from the end of each aisle when a choice of

direction is available. Where the room containing the shelving (aisles) is an access room, then an emergency exit sign(s) should be visible to a person on exiting the inner room.

[A1] NOTE 4 **[A1]** The provision of an emergency exit sign at each half landing is not a requirement of this standard unless due to the layout of the building confusion could otherwise occur as to the direction of escape.

- e) additional emergency exit signs shall be provided where the line of sight to the next sign would exceed the recommended maximum viewing distance of the sign,
- f) an emergency exit sign shall be provided where confusion may otherwise occur,
- g) **[A1]** an emergency exit sign shall be provided near to each final exit .If the immediate area outside the final exit has hazards in darkness then a risk assessment should determine if further emergency exit signs are needed until a place of safety can be reached **[A1]**,
- h) emergency exit signs shall not be fixed to doors or sited where they may be obscured by opening doors,
- i) where commercial or artistic considerations require signs or objects which, because of their size, brightness, design or proximity, might be confused with or prevent recognition of an emergency exit sign, the location of the emergency exit sign may be slightly displaced provided safety is not compromised. Otherwise the confusing signs or objects should be removed,
- j) the effectiveness of an emergency exit sign shall not be adversely affected by the presence of other signs, conveying directional information in a similar format or by other internally illuminated signs or by competing or distracting light sources.

8.6.3 Illumination

Emergency exit signs shall be illuminated at all material times and in the event of failure of the supply to the normal lighting.

For maximum visual impact emergency exit signs shall be placed perpendicular to the line of sight of persons using the escape route.

NOTE Photo-luminescent exit signs cannot be used in place of electrically powered signs but can be used as supplementary and/or externally illuminated signage.

8.6.3.1 Internally illuminated emergency exit sign

The luminance of any coloured area of the safety sign shall be at least 2 cd/m^2 for all relevant viewing distance on emergency operation (see 5.4 and Annex A of I.S. EN 1838:2013).

The ratio of the maximum to the minimum luminance within either white or the safety colour shall be not greater than 10:1.

NOTE High variation of adjacent points should be avoided.

The ratio of the luminance $L_{\text{contrast colour}}$ to the luminance $L_{\text{safety colour}}$ shall be not less than 5:1 and not greater than 15:1 (see Annex A of I.S EN 1838:2013).

The safety colour and contrast colour shall conform to the requirements of ISO 3864-1 and ISO 3864-4, and shall be measured in accordance with ISO 3864-4.

The minimum duration of illumination of the safety signs shall be the rated duration of the system.

Safety signs shall be illuminated to at least 50 % of the required luminance within 5 s and full required luminance within 60 s.

8.6.3.2 Externally illuminated A_1 emergency A_1 exit sign

A_1 A_1

The position of the luminaire(s) relative to the sign shall be such as to cause no reduction in the contrast of the sign (due to reflection of the luminaire in the face of the sign) when viewed within the required range of directions.

A_1 Where a sign is illuminated by an external source the vertical illumination shall be a minimum of 50 lux under normal lighting conditions and a minimum of 15 lux, at a uniformity of 0,7, on emergency operation. A_1

A luminaire provided specifically for the purpose of lighting the sign shall be mounted at a maximum distance of 2 m from the sign. To allow the sign to be seen more effectively the luminaire shall employ optics with a cut off angle of $\leq 60^\circ$ within the observer's field of vision at an angle of $\leq 20^\circ$ above the horizontal view.

8.6.4 Viewing distance

An internally illuminated sign is discernible at greater distance than an externally illuminated sign of the same size. The maximum viewing distance A_1 (see Figure 9) A_1 shall be determined by use of the following formula:

$$l = Z \times h$$

Where:

l is the distance of observation,

h is the height of the graphical symbol of the sign,

Z is the factor of distance (Z is a constant: 200 for internally illuminated signs; 100 for externally illuminated signs).

The dimensional units of h and l shall be the same.

NOTE The minimum height of the graphical element for all illuminated exit signage A_1 should A_1 be 100 mm

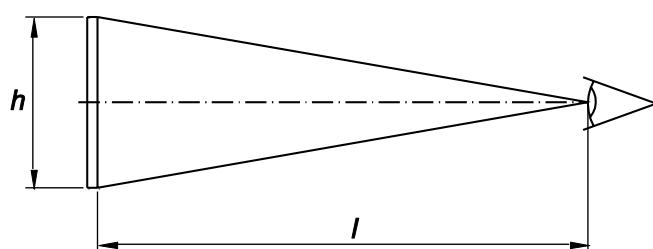


Figure 9 — Viewing Distance

8.6.5 Mounting height

Signs shall be positioned between 2 m and 3 m above floor level measured to the base of the sign.

NOTE To ensure that the  emergency exit sign  is within the observer's field of vision the sign should be mounted not higher than 20° above the horizontal view for all observer points within the viewing range of the sign.

The following principles, which will assist the evacuee to predict the location of successive signs, shall be applied:

- a) signs above doors or in open spaces shall be mounted between 2 m and 3 m from floor level, measured to the base of the sign and be sited as close to the centre line of the escape route as practical,
- b) where smoke reservoirs are provided, the emergency exit signs shall be mounted below these,
- c) mounting heights greater than 3 m may be used, e.g. in large open spaces or for operational reasons, but care shall be taken to ensure that such signs are both conspicuous and legible,
- d) signs shall be sited at the same height throughout the escape route, so far as is reasonably practicable.

8.7 Emergency lighting luminaires

8.7.1 Construction

Emergency lighting luminaires shall be designed and constructed in accordance with the requirements of I.S. EN 60598-2-22. For fusing requirements, see 8.3. The luminaire shall have an IP classification, as defined in I.S. EN 60529, appropriate to the application. In respect of the selection and installation of luminaires for use in potentially explosive atmospheres, the provisions of the National Rules for Potentially Explosive Atmospheres (ET 105) shall apply.

Emergency luminaires shall be selected so that they are appropriate for the environment in which are required to function. This may include consideration of operating temperature ranges.

Photometric data shall be provided by the manufacturer in accordance with I.S. EN 13032-3.

8.7.2 Flammability

Emergency lighting luminaires shall comply with the non-flammability (resistance to flame and ignition) provisions specified in I.S. EN 60598-2-22.

8.8 Central power supply systems

Central power supply systems shall comply with I.S. EN 50171.

8.8.1 Batteries for central power supply systems

Batteries for central power supply systems shall comply with 6.12 of I.S. EN 50171:2001.

Batteries for central power systems (CPS) shall be of a type having a declared life expectancy of at least 10 years at 20 °C ambient temperature.

Batteries for low power systems (LPS) shall be of a type having a declared life expectancy of at least 5 years at 20 °C ambient temperature.

NOTE To achieve full performance at the end of life, the battery capacity should be sized in accordance with the battery manufacturer's data.

8.8.2 Luminaire identification (slave luminaire)

For an emergency escape lighting luminaire that is powered by a central power system, each luminaire that forms part of the emergency escape lighting system shall be clearly identifiable from floor level. Luminaires may be identified by means of label, tag or indicator light. Where it is not possible to place a label, tag or indicator light on the luminaire it shall be placed as close as possible to the luminaire but no greater than 200 mm from it.

NOTE It is recommended that the text on the label or tag contains the luminaire number preceded with the text "EL" or similar text, to indicate it is an emergency escape lighting luminaire for example EL12 indicates that this is emergency escape luminaire 12 on the system.

8.9 Batteries for self-contained luminaires

Batteries should be rated for a minimum of 4 years of normal operation, and should be replaced when the luminaire no longer meets the required duration.

The surface temperature of batteries shall always be maintained within the rated operating temperature of the battery as defined by the manufacturer.

9 Circuit requirements and test facilities for self-contained luminaire systems

9.1 General

The electrical installation of emergency lighting systems shall be carried out to comply with ET 101.

Suitably qualified persons shall be a registered electrical contractor (REC) as recognised by the ~~A1~~ Commission for Energy Regulation ~~A1~~ (CER).

9.2 Control equipment

Control equipment and batteries located outside a self-contained luminaire shall be mechanically protected and mounted in a fire resistant enclosure and marked 'EMERGENCY LIGHTING'.

Cables from the luminaire to the enclosure greater than 1 m in length shall ~~A1~~ comply with 10.2.1. a). ~~A1~~

NOTE Wiring within a luminaire is excluded from the requirements of this clause and is covered separately in I.S. EN60598-2-22.

9.3 Test facility

Each emergency lighting system shall have a suitable facility for simulating failure of the normal supply for test purposes. The facility shall not interrupt the normal lighting supply to the area concerned. After the test period the emergency lighting system shall be automatically restored to its normal state. The facility for simulating failure shall be capable of carrying out the following tests where the applicable emergency lighting systems are installed:

- a) functional test (typically 20 s) but not exceeding 10 % of the rated duration (ATS only),
- b) functional test of 30 min and 10 min for 3 h and 1 h respectively (all test facilities except ATS),
- c) functional test of 60 min (CGPS only),
- d) full duration test for 3 h and 1 h systems (all test facilities).

NOTE In the case of non ATS systems, and depending on the size and layout of the building, consideration should be given to the number of emergency luminaires allocated to a manually operated test facility(s) to ensure adequate inspection time.

10 Central Power Systems (CPS): Cables, wiring systems, circuit requirements, test facilities and location for central power supply systems

10.1 General

The electrical installation of an emergency lighting system shall be carried out to comply with ET 101.

Suitably qualified persons shall be a registered electrical contractor (REC) as recognised by the A1 Commission for Energy Regulation (CER). A1

10.2 Cables

A1

10.2.1 General

Wiring systems for a centrally powered emergency lighting system shall retain the continuity of supply from the source to the luminaires for an adequate period in the event of a fire. This shall be achieved by the use of cables with an inherently high resistance to attack by fire for the transfer of power through fire compartments and the interconnection of luminaires.

10.2.2 Cabling between fire compartments

Cables used for the transfer of power from the CPS through fire compartments shall comply with the following:

- a) Cables with an overall diameter not exceeding 20 mm:

Cables shall, as a minimum, have a duration of survival of 120 min when tested in accordance with BS 8434-2:2003+A2:2009.

- b) Cables with an overall diameter in excess of 20 mm:

Cables shall, as a minimum, have a duration of survival of 120 min when tested in accordance with BS 8491:2008.

10.2.3 Interconnection of luminaires

10.2.3.1 General

The intent of the Standard is to delay or prevent the complete failure of the emergency escape lighting in that part of the building affected by fire. Where a single circuit is used to provide emergency escape lighting within a compartment of an escape route, steps shall be taken to protect the integrity of this circuit in accordance with 10.2.3.2. Where the emergency escape lighting is provided by two or more circuits within a compartment of an escape route, alternative wiring methods may be used in accordance with 10.2.3.3

10.2.3.2 Escape lighting provided by a single emergency circuit

Where a single circuit is used to provide emergency escape lighting within a compartment of an escape route, cables used for the interconnection of luminaires supply shall meet the requirements of 10.2.1.

The connection to the emergency lighting supply shall be made with ceramic/porcelain terminals, housed in a connection enclosure possessing a minimum functional integrity of 90 min. (see 10.3.3).

In order to protect the integrity of the circuit, a ceramic fuse of appropriate discrimination shall be provided within the connection enclosure.

No more than 20 luminaires shall be supplied from any final circuit.

Flexible cable, complying with I.S. EN 50525-3-11, may be used for the final connection, not exceeding 2m, to the emergency luminaire.

All emergency luminaires shall comply with 10.3.7.

NOTE Refer to Annex K for typical wiring arrangements for single and multiple compartments.

10.2.3.3 Escape lighting provided by two or more emergency circuits

Where two or more circuits are used to provide emergency escape lighting within a compartment of an escape route, cables used for the interconnection of luminaires supply shall, as a minimum, have a duration of survival of 60 min when tested in accordance with I.S. EN 50200:2015 (which corresponds to a classification of PH 60 as detailed in I.S. EN 50200:2015, Annex D).

Luminaires shall be wired alternately from at least two circuits so that a level of illuminance is maintained along the escape route or in an open area in the event of the loss of one circuit.

No more than 20 luminaires shall be supplied from any final circuit.

Overcurrent protective devices shall be used so that a short-circuit in one circuit does not interrupt the supply to the adjacent luminaires or luminaires in other compartments.

Flexible cable, complying with I.S. EN 50525-3-11, may be used for the final connection, not exceeding 2m, to the emergency luminaire. This connection shall be made with ceramic/porcelain terminals, housed in a connection enclosure possessing a minimum functional integrity of 60 min.

All emergency luminaires shall comply with 10.3.7.

NOTE 1 Consideration should be given to routing each circuit in separate containment to reduce the likelihood of the failure of both circuits.

NOTE 2 Refer to Annex K for examples of wiring arrangements for single and multiple compartments. A1

10.3 Wiring

10.3.1 General

Cables or cable systems used for the connection of an emergency escape lighting luminaire to the standby power supply shall adequately resist the effects of fire and mechanical damage. This should be achieved through the use of cables or cable systems with an inherently high resistance to the effects of fire, and either with inherently high resistance to mechanical damage, or with additional mechanical protection in any areas in which physical damage or rodent attack is likely. Cables or cable systems should be routed through areas of low fire risk wherever practicable.

In selecting cable sizes, due regard shall be paid to limitations imposed by voltage drop and physical strength.

Each conductor shall be of copper having a nominal cross-sectional area of not less than 1,5 mm². The voltage drop in cables connecting a CPS to a slave luminaire shall not exceed 4 % of the system nominal voltage at maximum rated current and at the highest working temperature likely to be experienced.

Slave luminaires shall be compatible with the central power supply to which they are to be connected.

10.3.2 Cable installation practice

Wiring of emergency lighting installations shall be exclusive to the installation and segregated from the wiring of other circuits, so that the emergency lighting circuits are protected against damage that may be caused by faults on other circuits and against interference that might occur during maintenance or alteration of other services.

Ducting, trunking or channels containing emergency lighting cables shall be marked to indicate its use.

When installing cables that are required to maintain circuit integrity under fire conditions, the resistance to fire of the cable fixings and any joints should be at least equivalent to the survival time required for the cable. Cable containment system should provide adequate protection in the presence of the potential hazards. Cables should be installed in accordance with the following recommendations:

- a) where fire-resistant cables have by their method of construction adequate mechanical protection, they shall either be fixed directly to the building structure, or be installed such that they are enclosed in or carried upon cable management or containment systems (see item b). If the cables are fixed directly to the building, the fixings shall provide adequate support in the presence of the potential hazards,
- b) where fire-resistant cables require additional mechanical protection, they shall be enclosed in or carried upon cable management or containment systems. Such systems shall provide adequate support and maintain necessary mechanical protection in the presence of the potential hazards. The supports should be sized to cater for the reduction in the tensile strength of steel when exposed to the effects of fire,
- c) cable management or containment systems that are not used as a primary means of support or to provide necessary mechanical protection shall not compromise the defined performance of the cables in the presence of the potential hazards,
- d) any glands used in the termination of fire-resistant cables into equipment shall not compromise the defined performance of the cables in the presence of the potential hazards,
- e) where practicable, the fire-resistant cable route shall be arranged to be one of the upper tiers of the coordinated high level services,

[A1] NOTE 1 **[A1]**When coordinating the route for the fire-resistant cables, it needs to be recognized that some of the other services, such as pipes, ducts, busbars and other cable routes, are likely not to be designed to maintain their integrity under fire conditions and could collapse during a fire. The result of the collapse could be the overloading of the fire-resistant cable containment system, which itself could then fail.

- f) In order to maximize the integrity of the fire-resistant cable system, fire-resistant and non-fire-resistant cable routes shall be segregated,

[A1] NOTE 2 **[A1]**Such practice could be advantageous when considering the sizing of the support systems (see 10.3.4) **[A1]** and Annex I **[A1]**.

- g) Where a cable support system is being used, cables shall wherever practicable be installed upon the cable support system. Where this is impractical due to the nature of the installation, the cable may be installed to the underside of the support system, provided the cable fixings are of the equivalent fire rating and cable manufacturers recommended spacing's are used,

h) Multi-core cables servicing emergency lighting circuits shall not be used for any other service.

A1 NOTE 3 **A1**Wiring within a panel is excluded from the requirements of this clause.

10.3.3 Joints

A1 Joints in cables, other than those made in system components such as luminaires, control units etc. shall be avoided where practicable. Where joints are unavoidable, they should be located in an area of low risk identified by risk assessment to minimize the risk of early failure in the event of fire.

Joints, other than those made in system components such as luminaires, control units etc. shall;

- a) be contained in an enclosure that will have a duration of survival of 90min when used for cables complying with 10.2.2,
- b) be contained in an enclosure that will have a duration of survival of 60min when used for cables complying with 10.2.3.3,
- c) For a) and b) the enclosure shall be labelled:

'EMERGENCY LIGHTING' or 'EMERGENCY ESCAPE LIGHTING' or 'STANDBY LIGHTING' as appropriate, to avoid confusion with other services.

NOTE 1 E90 & E60 enclosures complying with DIN 4102-12 are deemed to meet the requirements of 10.3.3 a) and b) respectively.

NOTE 2 For specific installations a higher duration of survival may be required for enclosures containing joints. This should be determined by risk assessment.

NOTE 3 Examples of suitable joints include metal terminal components mounted in ceramic/porcelain blocks. **A1**

10.3.4 Cable support systems

Methods of cable support and fixings should be non-combustible and such that circuit integrity will not be reduced below that afforded by the cable used. **A1** **A1**

NOTE In effect, this recommendation precludes the use of plastic cable clips, cable ties or trunking where these products are the sole means of cable support. Steel and copper are examples of materials that **A1** maybe be suitable. **A1**

Cable fixings shall be in accordance with the manufacturer's recommendations.

Cable fixing centres shall be within the cable manufacturer's recommended maximum spacing's for both the vertical and horizontal runs.

Where cable management system support is provided by drop rods, either alone or in conjunction with other support methods, the drop rod size should be calculated in accordance with Annex I.

10.3.5 Overhead lines

Overhead lines for an emergency lighting system should be avoided. Physical separation of the routing of two circuits shall be such that a fault from an external agency causing the failure of one will not interfere with the integrity of the other.

10.3.6 Damp, corrosive or underground locations

Where an appraisal of the installation location indicates that cables for emergency lighting circuits are to be installed in locations or atmospheres that are wet, damp, or contaminated by corrosive solid or liquid materials, they should have a sheath which protects the cable against such conditions. Where a suitable sheath cannot be obtained, then over-wrapping with, or containment within, a material that will provide suitable protection shall be provided.

[A1]

10.3.7 Luminaires for central power systems

Luminaires connected to central power systems shall withstand the 650°C glow wire test according to I.S. EN 60598 -1:2015&AC:2015&AC:2016.

Luminaires shall contain a fuse, relay, other protective device, or have over-current protection inherent in the design of the luminaire circuitry/components.

Luminaires intended for direct interconnection of luminaire supplies shall have provision for separate cable entry points with strain relief and double pole terminals. The luminaire shall employ a fixing method sufficient to accommodate the strain of these cables.

NOTE Luminaires designed to operate on Safety Extra Low Voltage (SELV) supplies without a protective ground connection, should have a fuse on both poles of the supply. **[A1]**

10.4 Location of central power systems and associated switchgear

Central power systems (CPS) and their associated main switchgear for use in emergency lighting applications shall be located in protected area(s) and/or compartment(s). The protected area(s) and/or compartment(s) shall have at least a 2 h fire resistance rating. **[A1]** **[A1]**

Due consideration should be taken in choosing a location for central power systems and their associated main switchgear in relation to the failure of other systems, structure and/or flooding. The protected area(s) and/or compartment(s) shall be free of other mechanical and electrical plant items and shall be maintained to ensure that correct ambient operating conditions exist in line with the equipment's manufacturer's installation guidelines and operational instructions.

10.5 Testing facility and circuit protection

10.5.1 General

Emergency lighting systems fed from a standby supply shall comply with ET 101.

10.5.2 Test facility

Each emergency lighting system shall have a suitable facility for simulating failure of the normal supply for test purposes. The facility shall not interrupt the normal lighting supply to the area concerned. After the test period the emergency lighting system shall be automatically restored to its normal state. The facility for simulating failure shall be capable of carrying out the following tests where the applicable emergency lighting systems are installed:

- functional test (typically 20 s) but not exceeding 10 % of the rated duration (ATS only),
- functional test of 30 min and 10 min for 3 h and 1 h respectively (all test facilities except ATS),
- functional test of 60 min (CGPS only),

d) full duration test for 3 h and 1 h systems (all test facilities).

NOTE In the case of non ATS systems, and depending on the size and layout of the building, consideration should be given to the number of emergency luminaires allocated to a manually operated \square test facility(s) \square to ensure adequate inspection time.

10.5.3 Isolation and maintenance hazards

Warning labels shall be provided in positions where they can be readily seen and read. The labels shall state that switching off the normal supply to an emergency lighting system may not make it safe for maintenance purposes. Such warnings are necessary because, for example, non-illumination of a lamp does not always indicate that a circuit is dead.

CPS by their inherent design and construction shall not automatically re-energise any electrically downstream circuit or luminaire which has either been manually isolated for safety purposes or which has failed due to a short circuit or overload condition.

10.5.4 Voltage compatibility of a slave luminaire and a central battery system

10.5.4.1 General

The following considerations shall be taken into account to ensure that a slave luminaire is compatible with the central battery supply to which it is connected.

10.5.4.2 d.c. only system

Slave luminaires shall be capable of operating over the following input voltage range:

- maximum voltage and battery float charge voltage,
- minimum voltage at the end of battery duration less a further allowance for cabling voltage drop, up to a maximum of 10 % of the system voltage.

For maintained systems, the luminaires shall also be capable of operating continuously at the maximum system voltage plus the r.m.s voltage ripple content of the d.c. supply which should not be above 3,5 %.

10.5.4.3 Combined a.c. and d.c. supplied systems

In the d.c. condition the luminaire should operate in accordance with 10.5.4.2. In the a.c. condition the luminaire shall operate continuously over the following voltage range:

- maximum voltage; the design transformer voltage plus the supply voltage variation plus transformer regulation, not exceeding 11 % total,
- minimum voltage; the design transformer voltage less the supply voltage variation less an allowance for cabling voltage drop up to a maximum of 10 % of the system nominal voltage (refer to I.S. EN 50171).

10.5.5 Fault condition

Protective devices utilised to protect the normal supply and emergency lighting supply to final emergency lighting luminaire sub-circuits, shall be configured such that in the event of an electrically downstream short circuit or overload fault, it shall not be possible for any normal supply or CPS emergency lighting supply to re-energise automatically any such final sub-circuit until the fault is cleared.

11 Consultation

11.1 General

Consultation between the relevant parties should be arranged at a very early stage.

11.2 Supply of plans

Plans of the building should be available at an early stage to assist the consultation and design process.

12 Choice of appropriate emergency lighting systems

12.1 Duration of operation

The emergency escape lighting system shall operate for the required rated duration appropriate to the building type (see Annex G for guidance on duration).

There may be special circumstances, depending on the particular design and function of the building, where the emergency evacuation and continuation of use procedures may require an extended duration. This should be determined through risk assessment and the fire safety strategy.

12.2 Type of system

Requirements for emergency lighting in different types of building are given in Annex G.

13 Emergency lighting design

13.1 General

The design process is a critical element of the emergency lighting system development and installation process. It must be carried out by a designer such as a chartered engineer who is experienced and competent in emergency lighting design, or a professional engineer experienced and competent in emergency lighting design who holds qualification in emergency lighting design of at least a Level 6 Award on the National Framework of Qualifications or other competent person.

NOTE It is the responsibility of the designer to demonstrate that they are competent to carry out the design of emergency lighting systems.

13.2 Determination of requirements

Complete the following actions where necessary:

- a) obtain where available a copy of the risk assessment and evacuation strategy carried out on the building at design stage and establish if there are any particular requirements for the building type (see Annex G),
- b) establish and verify escape routes (for illumination requirements see Clause 7 and Annex A),
- c) establish if there is a need for standby lighting (see 6.3),
- d) establish the requirements for emergency escape lighting (see 8.5.2),
- e) identify all positions (points of emphasis) that require emergency escape lighting (8.5.1),
- f) establish circuit and wiring requirements for system type (see Clauses 9 and 10),
- g) confirm a suitable test facility(s) has been included in the design (see 9.3 or 10.5.2),
- h) specify that the emergency lighting luminaires shall conform to I.S. EN 60598-2-22 (see 8.7.1),
- i) specify that the emergency exit signs conform to the pictogram requirements of Annex B and the luminance requirements of I.S. EN 1838:2013,
- j) ensure that there are at least two sources of emergency illumination in each escape route compartment (see 8.2).

NOTE The above list is non-exhaustive.

13.3 Design of illuminance

Having determined the positions and areas which need to be illuminated, the detailed design should address the following:

- a) position emergency luminaires on the plan (A1 see 11.2 A1),
- b) determine the mode of operation (see Clause 5),
- c) check voltage and possible voltage drop (see Clause 10),
- d) verify the mounting height of luminaires (see 8.4),

- e) choose emergency lighting luminaires,
- f) obtain photometric data of the luminaries,
- g) determine maintenance factor,
- h) calculate the illuminance (see Clause 7 and Annex A),
- i) check uniformity (see 7.3).

NOTE 1 The system shall be designed using zero surface reflectance.

NOTE 2 The above list is non-exhaustive.

13.4 Design of system

Complete the following actions where necessary:

- a) determine the type of emergency lighting system to be used (see Clause 5), e.g. central battery, self-contained and whether automatic or manual testing will be required,
- b) establish mode of operation (e.g. maintained or non-maintained),
- c) choose the cables for the system (see 9.2 and 10.5.2),
- d) determine the routes and methods of cable installation (see 10.3.2),
- e) check suitability of joints in cables, and warning labels (see 10.3.3),
- f) check suitability of cable support systems (see 10.3.4),
- g) check suitability of wiring and circuit components for use in any damp, corrosive or underground locations (see 10.3.6),
- h) check suitability of the location of central power systems (see 10.4).

NOTE 1 Items c) to h) apply only to central powered systems.

NOTE 2 The above list is non-exhaustive.

14 Handover documentation and logbook

14.1 Handover documents

At handover a logbook with the following minimum record documentation shall be provided:

- a) a set of as installed emergency lighting layout drawings which identify at a minimum the location, type, identification number/label and other pertinent information for the emergency lighting luminaires and the emergency lighting system's main equipment and components,
- b) technical operational manuals, data sheets and details for conventional, non ATS, testing devices which shall be utilised to test the emergency lighting installation,
- c) technical operational manuals, data sheets and details of any automatic test system (ATS). The ATS's main characteristic and mode of operation to the requirements of I.S. EN 50172 as well as an exact classification to either Type S, Type P, Type ER, Type PER or Type PERC as defined by Annex B of I.S. EN 62034:2012 shall be stipulated,
- d) details of the installed emergency lighting system's manufacturer's data sheets and a list of standard replacement parts and components (e.g. lamps, batteries, fuses and CGPS fuel type and grade),
- e) A copy of the following certificates:
 - Certificate of Design,
 - Certificate of Installation,
 - Final Certificate of Commissioning,
 - Certificate of Handover.

14.2 Logbook format and location

The emergency lighting logbook, which may be in a hardcopy or electronic format, shall contain the required information as detailed in 14.1 and 14.3 at a minimum and any further relevant information, in an organized and concise form.

The logbook shall be kept in a secure location in the building and shall be made available by the owner/occupier at all reasonable times for examination by any duly authorised person.

14.3 Updating and managing the logbook

The Emergency Lighting Logbook shall be updated with the following details and documents where they are applicable:

- a) date and brief details of all inspections and tests,
- b) details of all modifications, alterations and/or additions to the Emergency Lighting System,
- c) a copy of subsequent commissioning certificate(s) to A1 I.S. 3217:2013+A1:2017 A1 relating to all modifications, alterations and additions to the emergency lighting system,

- d) details of maintenance or services works carried out on the emergency lighting system, following daily, weekly, monthly, quarterly and annual routine inspections and tests as recorded in the emergency lighting register (See Annex J for model emergency lighting register),
- e) a copy of all issued reports of inspection, testing and servicing and reports following annual inspection and testing of the emergency lighting system to A1 I.S. 3217:2013+A1:2017 A1,
- f) a copy of all certificates for annual inspection and testing issued for the emergency lighting system,
- g) a copy of the schedule for periodic inspection, test and servicing due dates (see Annex F for model schedule).

A1 NOTE Where record drawings for a building are no longer available, it is recommended that a register of the emergency lighting system be put in place and maintained. The register should contain details of the location and type of emergency light fittings, emergency exit signs and the main emergency lighting system components e.g. CBS, test facilities. Where record drawings are no longer available and a register is in place, this should be noted in the "As installed Drawing(s)" section of the relevant certificate or report following inspection and testing of the emergency lighting system. The emergency lighting system register would be separate from the model register in Annex J which is intended to be used to record details of maintenance or service works carried out on the emergency lighting system. A1

15 Managerial responsibilities

It is the responsibility of the owner/occupier/management of the building to ensure that the emergency lighting system is maintained in accordance with Clauses 14 and 16.

16 Commissioning, maintenance, inspection and testing

16.1 General

The inspection, testing (as detailed in 16.2.1, 16.2.2, 16.2.3, 16.2.4, and 16.2.5) and commissioning of any emergency lighting system shall be carried out by a competent person who has adequate training, knowledge and experience in both the requirements of this standard and the systems' components, in addition having access to relevant tools, equipment, information and knowledge of any special procedures as recommended by the manufacturer(s).

NOTE It is the responsibility of the individual to demonstrate that they are competent to carry out inspection, testing and commissioning of emergency lighting systems. An appropriate qualification in emergency lighting under the National Framework of Qualifications could assist in demonstrating competence.

Inspection and testing, as detailed in 16.2.4 and 16.2.5 shall be carried out every year by a competent person. The sequence shall be scheduled periodically to occur at least four times in the year at intervals of no less than 2 months and not greater than 4 months. The sequence shall ensure that the interval between the final inspection and testing in one year and the first in the following year shall not exceed 4 months.

For the purpose of this Standard, maintenance of a system that requires the replacement of obsolete or faulty fittings, equipment or components does not require an emergency light certificate of design (Annex C2) providing the fittings, equipment or components used do not lower the performance of the emergency lighting system below the requirements of the Standard to which it was originally commissioned.

>All emergency lighting systems shall be tested to and achieve their rated duration at commissioning. Details and recommendations for commissioning are given in Annex H.

16.2 Routine maintenance, inspections and testing

Given the possibility of a failure of the normal lighting supply occurring shortly after a duration test or during the subsequent recharge period, all tests shall be undertaken at a time of minimum risk. Alternatively, suitable arrangements shall be made until the batteries have been recharged.

As recommended in 6.11 of I.S. EN 50171:2001, in the case of a CPS, if the building may be occupied during and after testing or if an ATS and CPS system are combined in the one installation, then measures should be taken to minimise the risk to occupants in the 24 h period following a full duration test. These could include:

- manual initiation of the test,
- dual batteries,
- a limited discharge test (see I.S. EN 50171 for recommendations).

Inspections and tests shall be carried out as detailed in 16.2.1 to 16.2.5.

16.2.1 Daily inspection methodology, schedule and checklist

The following minimum operational requirements shall be checked:

- a) all deficiencies, defects and/or faults previously recorded in the emergency lighting logbook have been rectified,

- b) all indicators and monitors of any central power systems and central generator power systems and all their associated switchgear and control systems are showing correct operation and the system(s) are in normal quiescent condition and fully ready,

- c) for ATS systems Type P, Type ER, Type PER and Type PERC check that there are no faults recorded at the graphical interface of central addressable controller,

NOTE This is a visual inspection of indicators and monitors to identify that the system(s) is in a ready condition and do not require further investigation or an operational test.

- d) record any emergency lighting system fault reported and or any other deficiencies, defects and/or faults otherwise discovered in the emergency lighting logbook and take any necessary corrective action(s) required in a timely fashion.

Additional checks to those listed above may be necessary due to either the type of system installed or as a result of other factors. These may include the identification of a need for additional checks as determined by a risk assessment or following a request for such additional checks by a local authority.

16.2.2 Weekly inspection methodology, schedule and checklist

In addition to the daily inspection methodology, schedule and checklist (16.2.1) the following shall be carried out on at least 25 % of the emergency lighting system so that 100 % of the system is checked at least every 4 weeks.

The following minimum operational requirements shall be checked:

- a) visually check that each emergency lighting lamp, in all maintained type and or combined (sustained) type emergency luminaires, are operational and illuminated,

A1 NOTE for ATS systems Type P, Type ER, Type PER and Type PERC the requirements of a) may be met by checking the graphical interface of the central addressable controller where such information is provided by the system. **A1**

- b) in the case of all self-contained and ATS (Type S) emergency luminaires check that their LED status indicators are illuminated and showing healthy condition/status,
- c) ensure that all non-illuminating lamps are replaced.

16.2.3 Monthly inspection & testing methodology, schedule and checklist: ATS Only

In addition to the weekly inspection methodology, schedule and checklist (16.2.2) the following shall be carried out:

A1

- a) the ATS shall perform a functional test at least once a month. The ATS shall simulate a power failure for a period no greater than 10 % of rated duration to determine that all emergency luminaires and lamps are operational and illuminating.
- b) following the termination of all simulated functional tests determine that all emergency luminaires' LED status indicators are illuminated and showing healthy condition/status. **A1**

A1 **A1**

16.2.4 Three-monthly (quarterly) inspection & testing methodology, schedule and checklist: all emergency lighting systems except ATS

The sequence shall ensure that inspections and testing meets the following schedule:

- a) Carried out four times in a 1 year period,
- b) Carried out every 3 months, **A1** and **A1**
- c) Carried out on the due date ± 30 days (see Annex F for schedule).

NOTE One of the four required inspections and tests shall be carried out as part of the annual inspection and testing schedule, see 16.2.5.

In addition to the weekly inspection methodology, schedule and checklist (16.2.2) the following shall be carried out.

16.2.4.1 Self-contained systems

For self-contained systems the following shall be carried out:

- a) for 3 h and 1 h systems simulate a power failure for at least 30 min and 10 min respectively, but not exceeding one quarter of the rated duration, via an appropriate test facility as detailed in 9.3, 10.5.2 and visually determine that all emergency luminaires and lamps are operational and illuminating,
- b) following the termination of all simulated functional and/or short duration power failure tests, check that all emergency luminaires' LED status indicators are illuminated and showing healthy condition/status,
- c) upon completion of the three monthly (quarterly) inspection and test, a report for inspection, testing and servicing as detailed in Annex C1 and Annex C7 shall be issued to the owner/occupier. A copy of the report shall be placed in the emergency lighting logbook. The schedule for periodic inspections and tests due dates shall be updated with the required information (see Annex F for model schedule).

16.2.4.2 Central Generator-Powered System (CGPS)

For all CGPS:

- a) check that CGPS status indicators and monitoring devices are indicating correct quiescent condition,
- b) check the fuel level of any associated inbuilt service tank(s) and/or remote bulk tank fuel reservoir(s) as well as lubrication oil and coolant.

For standard CGPS:

- simulate a power failure via a conventional self-resetting test device to initiate the start, run and operation at full load, for a period sufficient to visually determine that all emergency luminaires and lamps are illuminated. This test period should not exceed 60 min. Simultaneously check the operational status of the CGPS equipment and associated starting battery set(s).

For CGPSs which utilise back up emergency lighting batteries to supply the load in the case of failure of the prime mover the following actions and checks shall be carried out:

- 1) disable the CGPS engine starting system,
- 2) for A1 all systems (3 h and 1 h) simulate a power failure to the CGPS system via an appropriate self-resetting test device as detailed in 9.3 and 10.5.2, A1
- 3) check that the changeover from the CGPS normal output to the reserve back-up battery output is functioning normally at full connected load,
- A1
- 4) on completion of this test, re-enable the CGPS engine starting system,
- 5) simulate a power failure to the system again via a conventional self-resetting test device for at least 60 mins so that the engine is allowed to start up in the normal way at full connected load,
- 6) re-check that all emergency lighting luminaires and lamps are operating,
- 7) check the charge/discharge/recharge functions and status of the CGPS starting battery set(s) and back-up battery set(s),
- 8) on completion of this test re-check that the fuel, lubricant and coolant levels are to the required operational levels and replenish where necessary. A1

Upon completion of the three monthly (quarterly) inspection and test, a report for inspection, testing and servicing, as detailed in Annex C1 and Annex C7 shall be issued to the owner/occupier. A copy of the report shall be placed in the emergency lighting logbook. The schedule for periodic inspections and tests due dates shall be updated with the required information (see Annex F for model schedule).

NOTE The inspection and testing methodology for central generator powered systems detailed in 16.2.4.2 are in reference to emergency lighting systems. Additional periodic inspections & tests may be required by the generator manufacturer. The manufacturer's maintenance instructions should always be checked before carrying out any maintenance, testing or service. ISO 8528-12 provides guidance on the periodic testing of generators.

16.2.4.3 Central powered systems (CPS)

For central powered systems the following shall be carried out:

- a) following an initial safety inspection of indicating and monitoring devices used to indicate a normal/safe condition, for 3 h and 1 h systems simulate a power failure, for a minimum period of 30 min and 10 min respectively, but not exceeding one quarter of the rated duration, via an appropriate test facility as detailed in 9.3, 10.5.2 and visually determine that all electrically downstream emergency luminaires and lamps are operating. Simultaneously check the charge/discharge/recharge status and operational functions of all CBU's and/or SIU's associated battery set(s),
- b) on completion of the short duration test, check that all CPS indicators and monitors are operating in correct quiescent condition with all associated battery set(s) recharging,
- c) upon completion of the three monthly (quarterly) inspection and test, a report for inspection, testing and servicing, as detailed in Annex C1 and Annex C7 shall be issued to the owner/occupier. A copy of the report shall be placed in the emergency lighting logbook. The schedule for periodic inspections and tests due dates shall be updated with the required information (see Annex F for model schedule).

16.2.5 Annual inspection and testing methodology, schedule and requirements

The sequence shall be scheduled to ensure that inspection and testing is carried out once in every 1 year period subsequent to the completion of 3 three monthly (quarterly) inspections and tests as detailed in 16.2.4.

In addition to the monthly and three monthly (quarterly) the minimum inspection and testing shall also be carried out as detailed in 16.2.5.2, 16.2.5.3, 16.2.5.4 and 16.2.5.5.

All emergency lighting systems shall be tested to their rated duration.

NOTE 1 An ATS should carry out an annual full duration test.

NOTE 2 The updating of the schedule for periodic inspections & tests due dates is not required for ATS

16.2.5.1 Certificate for annual inspection and testing

The certificate for annual inspection and testing shall only be issued when all applicable items detailed in the requirements for the certificate for annual inspection and testing (Annex D) are confirmed and when all faults with the emergency lighting system are rectified. The requirements detailed in Annex D are a non-exhaustive list and are the minimum required for a certificate of annual inspection and testing.

A copy of the certificate (Annex C6) shall be placed in the emergency lighting logbook and the certifying person must store a duplicate copy in a way that it is retrievable and traceable.

If an annual inspection and testing certificate is withheld then a report following annual inspection and testing shall be issued that details the reasons and where any faults and/or deviations exist, see Annex C1 and Annex C8. A report following annual inspection and testing shall always be issued if faults and/or deviations are found during annual inspection and testing.

16.2.5.2 Inspection and testing applicable to all emergency lighting system types

The inspection and testing items detailed in Annex D shall be carried out.

The schedule for periodic inspections and tests due dates shall be updated with the required information (see Annex F for model schedule).

NOTE 1 If it is not possible to visually examine all emergency lighting luminaries' operation, that comprise a complete system, during the indicated full durational test period over any single 24 h period, then individual sections or zones of the emergency lighting system should be tested separately, in sequence, until the entire emergency lighting system has been tested and examined. However, the complete emergency lighting system or a section, zone or part thereof, should not be discharged for more than the full rated duration at any one time, over any single 24 h period.

NOTE 2 To ensure that the overall operational integrity of the complete emergency lighting system, or part thereof, in terms of the required minimum full duration, should an actual power failure occur following a full discharge duration test(s), it is important that such full duration test(s) are only carried out at times preceding periods of minimum risk to the building, or structures, users and/or occupants.

16.2.5.3 Central powered systems (CPS)

In addition, the items listed in 16.2.5.2 the following applies:

- a) check the physical condition of all associated cells and/or battery sets in relation to general cleanliness whilst also paying particular attention to terminal tightness. Check all terminals' electrical and/or mechanical degradation (if any), resulting from the corrosion/oxidation of any metal contacts due to electrolytic effects. Check all cells and/or battery sets for signs of electrolyte leakage,
- b) for all central power systems that utilise vented cells, top up as necessary all such cells with distilled or de-ionized water only to fully replenish same to their nominal electrolyte volume. Check and record all associated individual vented cells in battery set(s) for the specific gravities of their electrolytes,
- c) check, measure, calculate and record the ampere hour capacity (Ah), conductance (S), internal impedance (Z) and state of health (SOH) of all associated cells, batteries and/or battery strings,
- d) during the full duration test period check that all indicators and monitors of the central power supply systems, to include all CBUs, SIU's and all their associated switchgear and control systems are showing correct operation and that the entire system(s) is/are in correct operational condition,
- e) for central power systems check, measure and record their operational ambient environmental conditions, in terms of temperature and humidity, for their location,
- f) following the termination of all full duration tests, check that all indicators and monitors of all central power systems, all their associated switchgear and control systems are showing correct operation and the system(s) is once again in a correct quiescent condition and ready with all associated batteries recharging.

16.2.5.4 Central generator-powered systems (CGPS)

In addition, the items listed in 16.2.5.2 the following applies:

- a) check that the fuel level(s) of any associated inbuilt service tank and/or remote bulk tank fuel reservoir(s) as well as all lubrication oil and coolant levels are to the system's nominal operational requirements and top up as necessary,
- b) A1 A1 check that the fuel level(s) of any associated inbuilt service tank and/or remote bulk tank fuel reservoir(s) as well as all lubrication oil and coolant levels are to the system's nominal operational requirements following the termination of all full durational tests and top up as necessary to fully replenish same,
- c) A1 A1 following the termination of all full duration test, check that all indicators and monitors and all their associated switchgear and control systems are showing correct operation and the system(s) is once again in a correct quiescent condition."

NOTE The inspection and testing methodology for central generator powered systems detailed in 16.2.5.4 are in reference to emergency lighting systems. Additional periodic inspections & tests may be required by the generator manufacturer. The manufacturer's maintenance instructions should always be checked before carrying out any maintenance, testing or service. ISO 8528-12 provides guidance on the periodic testing of generators.

16.2.5.5 ATS systems

In addition, the items listed in 16.2.5.2 the following applies:

- a) in the case of ATS classification Type P, Type ER, Type PER or Type PERC verify via the ATS controller that all such emergency luminaires and lamps are operational, illuminating and have carried out a full duration test during the previous 52 week period. In the event that particular emergency luminaires have not executed the full duration test automatically, then this test shall be manually initiated,
- b) in the case of ATS classification type P, record the results of the full duration test in the logbook,
- c) where an ATS of Classification Type ER, Type PER or Type PERC is installed, carry out an analysis, self-test and calibration of the ATS's normal operation as per the manufacturer's instructions and once satisfied that the ATS is operational, monitoring, indicating and calibrated correctly, print and check the complete emergency lighting system's status report and fault report(s),
- d) In the case of ATS classification type S, check that all emergency luminaires are indicating system healthy status. In the logbook record the location and current status of any emergency luminaires displaying a fault condition.

Annex A

(informative)

Measuring illuminance of emergency lighting

All site test work should be carried out by simulating a failure of the normal electrical supply and where practicable this shall be done using the test facilities provided.

The light meter should be suitable for taking readings at the low illuminances involved and should have cosine correction. It should have a minimum range of 0,01 lux to 100 lux and sensitivity of 0,01 lux. The sensing device should be connected to the meter by a detachable lead. It should comply with I.S. EN 1838:2013, Annex A.2.

The measurement of the illuminance should be made on the same plane as that used for design which should accord with the requirements of Clause 13.

The effect of stray light (e.g. street or moonlight) can be substantial and as far as practicable it should be masked out. Where it cannot be excluded the illuminance from the emergency lighting should be obtained by taking readings at appropriate positions inside the building with all interior lighting, including the emergency lighting, switched off. The readings so obtained should be deducted from readings taken at the same positions with the emergency lighting switched on.

The subsequent tests should be completed as quickly as is practicable within the rated duration. This is particularly relevant in an occupied building or one in daily use as with discharged batteries the building could have reduced emergency lighting cover for up to 24 h following the test.

For measurement of emergency lighting on clearly defined escape routes it is advisable to select for test a number of specific areas likely to have minimum illuminance. Suggested locations are:

- a) half-way between luminaires especially in stair wells,
- b) critical task areas,
- c) where highest luminaire mounting height occurs,
- d) where widest spacing of luminaires occurs,
- e) changes in direction of route, and
- f) at thresholds of doorways forming part of the exit route.

Tests should not be carried out in areas where people will not normally tread, i.e. in extreme corners where a wall meets a floor or stairway.

In practice the illuminance over an area is seldom uniform. The interior should therefore be theoretically divided into a number of zones, the illuminance in each zone should be measured and the mean value calculated. The total number of measurements taken in any open space should be not less than the total area in square metres divided by a constant value of 25, and in any case should be not less than 4.

The results of the measurement should be checked against design data.

The rated duration of self-contained luminaires will need to be checked individually. For a central system it is only necessary to carry out the test of one luminaire, preferably that luminaire subject to the highest voltage drop.

Annex B (normative)

Emergency Exit Signs

Emergency exit signs shall be rectangular or square in shape.

Emergency exit signs shall be white pictogram on a green background (the green part to take up at least 50 % of the area of the sign). The colour references for the emergency exit signs shall be:

- Green: RAL 6032,
- White: RAL 9003.

A1 Type 1 signs comply with I.S.EN 1838:2013 and ISO 7010:2012+A5:2015.

Type 2 signs comply with I.S. EN 1838:1999 and ISO 7010:2003+Amd 2:2007 A1

NOTE S.I. 299 of 2007 sets down requirements for safety signs.

A1 Table B.1 sets out the types of emergency exit signs which shall be used.

To ensure continuity of signage throughout a building it is recommended that only one type of emergency exit sign shall be used.

For new buildings Type 1 emergency exit signs shall be used throughout. In the case of significant alteration, or an extension to an existing installation, it is recommended that Type 1 be used.

Where non-graphical 'EXIT' type emergency exit signs are encountered these must be upgraded to Type 1 in all cases. A1

IMPORTANT — The colours represented in the electronic file of this Standard can be neither viewed on screen nor printed as true representations. Although the copies of this Standard printed by NSAI have been produced to correspond (with an acceptable tolerance as judged by the naked eye) to the requirements of ISO 3864-1 and ISO 3864-4 it is not intended that these printed copies be used for colour matching.

Table B.1 — Emergency Exit Signs

Meaning as viewed from in front of the sign	Type 1 Emergency Exit Sign	Type 2 Emergency Exit Sign
Proceed down to the right (indicating change of level).		-
a) Proceed up to the right (indicating change of level). b) Proceed forward and across to the right from here when suspended within an open area.		-
Proceed down to the left (indicating change of level).		-
a) Proceed up to the left (indicating change of level). b) Proceed forward and across to the left from here when suspended within an open area.		-
Proceed forward and up from here (indicating change of level).		-
Proceed to the right from here (indicating direction of travel).		-
Proceed to the left from here (indicating direction of travel).		-
a) Proceed forward from here (indicating direction of travel). b) Proceed forward and through from here; when sign is sited above a door (indicating direction of travel). c) Proceed down from here. (indicating direction of travel).		-
Proceed to the right from here (indicating direction of travel).	-	
Proceed to the left from here (indicating direction of travel).	-	
a) Proceed forward from here (indicating direction of travel). b) Proceed forward and through from here; when sign is sited above a door (indicating direction of travel).	-	

Annex C1

(normative)

Certificates and Reports

C.1 General

For all new emergency lighting systems or existing systems that undergo modifications, alterations or extensions the following certification shall be provided:

- 1) Emergency Lighting System, Certificate of Design,
- 2) Emergency Lighting System, Certificate of Installation,
- 3) Emergency Lighting System, Certificate of Commissioning for New Installation/Modification/Extension or Alteration to an Existing System [Final Certificate of Commissioning],
- 4) Emergency Lighting System, Certificate of Handover.

C.1.1 Annual inspection and testing

For all emergency lighting systems, where faults and/or deviations are detected during the checks and tests carried out as detailed in 16.2.5, a "Report following Annual Inspection and Testing" shall be issued and a copy shall be retained in the logbook.

C.1.2 Three monthly inspection and testing/special service following a fault/other non-routine attention

For all emergency lighting systems, a "Report for Inspection, Testing & Servicing" shall be issued and a copy shall be retained in the logbook.

C.1.3 Content and layout of certificates and reports

The following model certificates and reports are contained in Annex C1 to Annex C8:

- Emergency Lighting System – **Certificate of Design** (see Annex C2),
- Emergency Lighting System – **Certificate of Installation** (see Annex C3),
- Emergency Lighting System – New installation/modification, extension or alterations to an existing system **[Final Certificate of Commissioning]** (see Annex C4). This certificate shall not be issued if any element of an emergency lighting system fails to meet the requirements of the Standard i.e. there shall be no deviations present,
- Emergency Lighting System – **Certificate of Handover** (see Annex C5),
- Emergency Lighting System – **Certificate for Annual Inspection & Testing** (see Annex C6),
- Emergency Lighting System – **Report for Inspection, Testing & Servicing** (see Annex C7),
- Emergency Lighting System – **Report following Annual Inspection & Testing** (see Annex C8).

The sample certificates and reports illustrate the layout and format in which they shall be provided.

The certificates and reports shall be printed on paper clearly showing the service provider's company details.

A copy of the Final Certificate of Commissioning and the Certificate for Annual Inspection & Testing shall be retained by the person/company responsible for issuing it.

Annex C2
(normative)

Emergency Lighting System Certificate of Design

This certificate shall be printed on paper clearly showing the design company's details

Certificate Number:.....

New System: Modification, Extension Or Alteration To Existing System: (tick appropriate box):

Building Name Owner and/or Occupier.....

Description of Works.....

Address of Building.....

Designer's Name.....

¹Design Drawing(s).....

Justifiable Variations/Items/Areas Excluded: [tick appropriate box(s)]

Justifiable Variations to ²I.S. 3217:2013+A1:2017 and/or the Specification: No Yes (listed as attached)

Items/Areas Excluded From This Certificate: No Yes (listed as attached)

I/We hereby certify that, to the best of my/our ability, knowledge and belief, the Emergency Lighting System at the above building as set out on the listed drawings has been designed by me/us in accordance with the requirements and recommendations of ²I.S. 3217:2013+A1:2017 except as stated on the attached justifiable variations (if any).

I/We confirm our competence to carry out this design.

I/We further confirm that, where the works are limited to modification, extension or alteration to an existing system, that I/we have given due consideration to the impact on the original system and I/we have taken adequate precautions to the best of my/our ability, knowledge and belief to ensure that there is no adverse impact on either the original system or the modifications.

Comment.....

.....

Details and signature of authorised person responsible for the design of the system:

Name..... Position

Signed..... Date:...../...../.....

For and on behalf of (company).....

¹ Design Drawings

² I.S. 3217:2013+A1:2017

Emergency Lighting System Certificate of Installation

This certificate shall be printed on paper clearly showing the installation company's details

Certificate Number.....

New System: Modification, Extension Or Alteration To Existing System: (tick appropriate box):

Building Name Owner and/or Occupier

Address of building

Description of Works.....

Installers Name

³Design Drawing(s).....

I/We hereby certify that the Emergency Lighting System at the above building has been installed by

me/us in accordance with the System Designer's specification and the System Designers' drawings above and in accordance with the requirements of ⁴I.S. 3217:2013+A1:2017.

I/we confirm my/our competence to undertake this work and to the best of my/our ability, knowledge and belief, the installation works comply with I 4I.S. 3217:2013+A1:2017.

I/we confirm that, where work has been undertaken to add to or modify an existing system, that due consideration has been given to the impact of this work on the existing system and to the best of my/our ability, knowledge and belief there will be no adverse affect(s) brought about by my/our work.

1/We also certify that, in accordance with the Designers' specification and ⁴I.S. 3217:2013+A1:2017, all
5as installed drawing(s) and installation certificates required have been provided, testing/inspecting
has been carried out and the certification issued.

As installed drawing(s).....

.....

Electrical Certification issued as required by ET101: ETCI Certificate number.....

Comment.....

Details and signature of authorised person responsible for the installation of the system

Name..... POSITION.....

Signed..... Date...../...../.....

For and on behalf of (company).....

3 Design Drawings

4 A1 I.S. 3217:2013+A1:2017 A1

5 $\langle A_1 \rangle$ as installed $\langle A_1 \rangle$

Annex C4
(normative)

Emergency Lighting System Final Certificate of Commissioning

This certificate shall be printed on paper clearly showing the commissioning company's details. ⁶The certificates and reports may contain the service providers' logo.

A copy of the ⁷ Final Certificate of Commissioning and the Certificate for Annual Inspection & Testing shall be retained by the person/company responsible for issuing it.

Certificate Number.....

Commissioning New System:

Commissioning for Modification, Extension or Alteration to Existing System: (tick appropriate box)

Building Name Owner and/or Occupier.....

Address of Building

.....
Description of Works

.....
⁸Design Drawing(s)

Justifiable Variations / Areas/Items Excluded: [tick appropriate box(s)]

Justifiable Variations to ⁹I.S. 3217:2013+A1:2017 and/or the Specification: No Yes (listed as attached)

Areas/Items Excluded From This Certificate: No Yes (listed as attached)

I/We hereby certify that the Emergency Lighting System at the above building, and as detailed above, has been inspected, tested and commissioned by me/us in accordance with the requirements of ⁹I.S. 3217:2013+A1:2017.

I/We confirm my/our competence to undertake this work and to the best of my/our ability, knowledge and belief the commissioned works outlined above comply with the standard except as outlined on the attached justifiable variations (if any)

Comment.....

.....
Details and signature of authorised person responsible for the commissioning of the system

Name..... Position.....

Signed..... Date:...../...../.....

For and on behalf of (company)

⁶ The certificates and reports may contain the service providers' logo

⁷ Final Certificate of Commissioning and the Certificate for Annual Inspection & Testing

⁸ Design Drawings

⁹ I.S. 3217:2013+A1:2017

Annex C5
(normative)

Emergency Lighting System Certificate of Handover

Certificate Number

New System: Modification, Extension or Alteration to Existing System: (tick appropriate box)

Address of Building

Extent of system covered by this certificate

.....
.....

The following information has been received by the owner/occupier

Certificate of Design

Y/N	Initials

Certificate of Installation

Final Certificate of Commissioning

Complete operation and maintenance manuals specific to the installed system

As installed drawings of the system indicating the positions and locations of all parts of the system

Proposal for a Service Contract Agreement for the system

System Logbook (Refer to 14.1)

My/Our attention has been drawn to my/our responsibilities under Clauses 14, 15 and 16 of
¹⁰I.S. 3217:2013+A1:2017

I/We being the person(s) responsible for the acceptance of the Emergency Lighting System, confirm receipt of the Handover Documentation as detailed above, and accept the system on behalf of:

Name..... Position.....

Signed..... Date:...../...../.....

For and on behalf of (owner /occupier).....

Comments.....

.....
.....
.....

¹⁰ A1 I.S. 3217:2013+A1:2017 A1

Annex C6
(normative)

Emergency Lighting System Certificate for Annual Inspection & Testing

This is not a final certificate of commissioning.

This certificate shall be printed on paper clearly showing the inspection, testing or servicing company's details.

A copy of this certificate shall be retained by the person/company responsible for issuing it.

Certificate Number.....

Applicable standard(s) to which the Emergency Lighting System was installed and is now being certified against: [tick appropriate box(s)]

I.S. 3217:1989 I.S. 3217:2008 I.S. 3217:2013 ¹¹I.S. 3217:2013+A1:2017

Is commissioning certificate available Yes No [tick appropriate box]

Building Name, Owner and/or Occupier

Address of Building

Description of Works and area being certified.....

¹²As installed drawing(s).....

System type: [tick appropriate box(s)] Self-contained Central Powered System ATS

Comments on system type:

I/We hereby certify that the Emergency Lighting System at the above building, and as detailed above, has been inspected and tested by me in accordance with the relevant requirements of 16.2.5 of ¹¹I.S. 3217:2013+A1:2017 and with reference to the applicable standard(s) to which the emergency lighting system was installed, confirm that there are no deviations or faults with the system as of the date of this declaration.

I/We confirm our competence to carry out this work.

Name..... Position.....

Signed..... Date:...../...../.....

For and on behalf of (company).....

Comments:

.....
.....

¹¹ I.S. 3217:2013+A1:2017

¹² As installed

Annex C7
(normative)

Emergency Lighting System Report for inspection, testing & servicing

*This is not a certificate for annual inspection and testing or a final certificate of commissioning.
This report shall be printed on paper clearly showing the inspection, testing or servicing company's details.*

Applicable standard to which the Emergency Lighting System was installed [tick appropriate box(s)]

I.S. 3217:1989 I.S. 3217:2008 I.S. 3217:2013 ¹³I.S. 3217:2013+A1:2017

Evidence Of Commissioning Available Yes No (tick appropriate box)

Building Name Owner and/or Occupier

Address of Building

Description of Works

¹⁴As installed Drawing(s)

The Inspection, Testing and Servicing work covered by this report is set out below (tick appropriate box):

- Quarterly Inspection and Test
- Special Servicing following a fault
- Other non-routine attention

I/We hereby declare that the Emergency Lighting System at the above building, and as detailed above, has been inspected, tested and/or serviced by me/us in accordance with the requirements of 16.2.4 (quarterly inspection) of ¹³I.S. 3217:2013+A1:2017 and with reference to the applicable standard(s) to which the emergency lighting system was installed, that all relevant details have been recorded in the logbook in accordance with Clause 14 and the schedule for periodic inspections & tests due dates has been updated.

I/We hereby declare that were this report relates to a special servicing following a fault(s) and/or other non-routine attention that the details of any deficiencies, defects and/or faults otherwise discovered and any necessary corrective action(s) required or carried out have be recorded in the logbook.

Comments/Recommendations.....
.....

I/We confirm my/our competence to undertake this work

Name Position

Signed: Date:...../...../.....

For and on behalf of (company)

¹³ I.S. 3217:2013+A1:2017

¹⁴ As installed

Annex C8

(normative)

Emergency Lighting System Report following annual inspection & testing

This is not a certificate for annual inspection and testing or a final certificate of commissioning. This report shall be printed on paper clearly showing the inspection, testing or servicing company's details.
 Applicable standard to which the Emergency Lighting System was installed [tick appropriate box(s)]

I.S. 3217:1989 I.S. 3217:2008 I.S. 3217:2013 ¹⁵I.S. 3217:2013+A1:2017

Building Name Owner and/or Occupier

Address of Building:.....

¹⁶As installed Drawing(s)

Reasons for withholding Certificate for Annual Inspection & Testing	Annex D ¹⁵ I.S. 3217:2013+A1:2017	
	Reference	Item Number(s) (if applicable)
	a	
	b	
	c	
	d	
	e	
	f	
	g	
	h	
	i	
	j	
Details of other deviations/deficiencies/faults found during Annual Inspection and Testing	Clause(s)	Reference of applicable standard(s)

^{A1}

% of installed fittings that function for the full duration

Luminaires %

Signs %

^{A1}

I/We hereby declare that the Emergency Lighting System at the above premises, and as detailed above, has been inspected, tested and/or serviced by me in accordance with the requirements 15.2.5 of ¹⁵I.S. 3217:2013+A1:2017 and with reference to the applicable standard(s) to which the emergency lighting system was installed, that all relevant details relating to faults, deficiencies or deviations and system maintenance have been recorded in the logbook and the schedule for periodic inspections and tests due dates has been updated.

Comments/Recommendations:.....

I/We confirm my/our competence to undertake this work.

Name..... Position.....

Signed..... Date:...../...../.....

For and on behalf of (company)

15 ^{A1} I.S. 3217:2013+A1:2017 ^{A1}

16 ^{A1} As installed ^{A1}

Annex D
(normative)

Emergency Lighting System Requirements for Certificate of Annual Inspection and Testing

A certificate for annual inspection and testing shall not be issued unless the applicable requirements detailed in Table D.1 are confirmed with reference to the applicable standard for the building. The requirements detailed in Table D.1 are a non-exhaustive list and are the minimum required for a certificate of annual inspection and testing. If a certificate for annual inspection and testing cannot be issued, then a report detailing the faults and/or deviations from the standard found shall be issued (see Annex C8).

Table D.1 — Requirements for Certificate of Annual Inspection and Testing

ITEM	REQUIREMENT	Requirements Applicable to the relevant version of I.S. 3217			
		1989	2008	2013	2017
a	Mode of operation for emergency exit signs is maintained ⁽¹⁾	Yes	Yes	Yes	Yes
b	There is evidence that the system is being adequately maintained	Yes	Yes	Yes	Yes
c	Emergency exit signs clearly and unambiguously indicate direction of escape	Yes	Yes	Yes	Yes
d	All emergency luminaires and signs are operational and meet the full durational test requirements	Yes	Yes	Yes	Yes
e	Following the completion of the full duration test all emergency lighting indicators show healthy status	Yes	Yes	Yes	Yes
f	The following points of emphasis have emergency luminaire(s) ⁽²⁾				
	1) each staircase	Yes	Yes	Yes	Yes
	2) each change in floor level	Yes	Yes	Yes	Yes
	3) each change of direction	Yes	Yes	Yes	Yes
	4) each fire alarm call point	Yes	Yes	Yes	Yes
	5) firefighting equipment	Yes	Yes	Yes	Yes
	6) each emergency exit door	Yes	Yes	Yes	Yes
	7.1) Outside each final exit and outside the building to a place of safety	N/A	N/A	Yes	Yes
	7.2) Outside each final exit and close to it ⁽³⁾	Yes	Yes	N/A	N/A

ITEM	REQUIREMENT	Requirements Applicable to the relevant version of I.S. 3217			
	8) emergency exit and safety signs required by the enforcing authority(s)	Yes	Yes	Yes	Yes
	9) each first aid post	N/A	Yes	Yes	Yes
	10) each intersection of corridors	Yes	Yes	Yes	Yes
	11) near escape equipment provided for the disabled	N/A	Yes	Yes	Yes
g	The following locations have emergency escape lighting provided				
	1) Lift cars	Yes	Yes	Yes	Yes
	2) Moving stairways and walkways	Yes	Yes	Yes	Yes
	3) Toilets and toilet lobbies	Yes	Yes	Yes	Yes
	4) Disabled toilets	Yes	Yes	Yes	Yes
	5) Refuge areas for the mobility impaired	N/A	Yes	Yes	Yes
	6) Motor generator, control, switch and plant rooms	Yes	Yes	Yes	Yes
	7) Covered car parks (pedestrian escape routes)	Yes	Yes	Yes	Yes
	8) Open areas greater than 60 m ²	N/A	Yes	Yes	Yes
	9) High risk task areas ⁽⁴⁾	N/A	Yes	Yes	Yes
h	There is a suitable test facility for simulating failure of supply	Yes	Yes	Yes	Yes
i	In the event of circuit failures on emergency escape stairwells, emergency escape lighting is present and functions ⁽⁵⁾	Yes	Yes	Yes	Yes
j	It is the opinion of the persons(s) undertaking the Annual Inspection and Testing that the illuminance requirements of the applicable version(s) of I.S. 3217 are complied with and that emergency lighting is provided in all locations as required by the applicable version(s) of I.S. 3217.	Yes	Yes	Yes	Yes

A1 (1) I.S.3217:1989 - Please refer to Annex F of I.S. 3217:1989 for exceptions: In particular F2, F3, F4, F6 and F8.2.

(2) For specific requirements of items listed in "f", please refer to the applicable standards.

(3) I.S. 3217:1989 - may rely on local authority lighting if adequate.

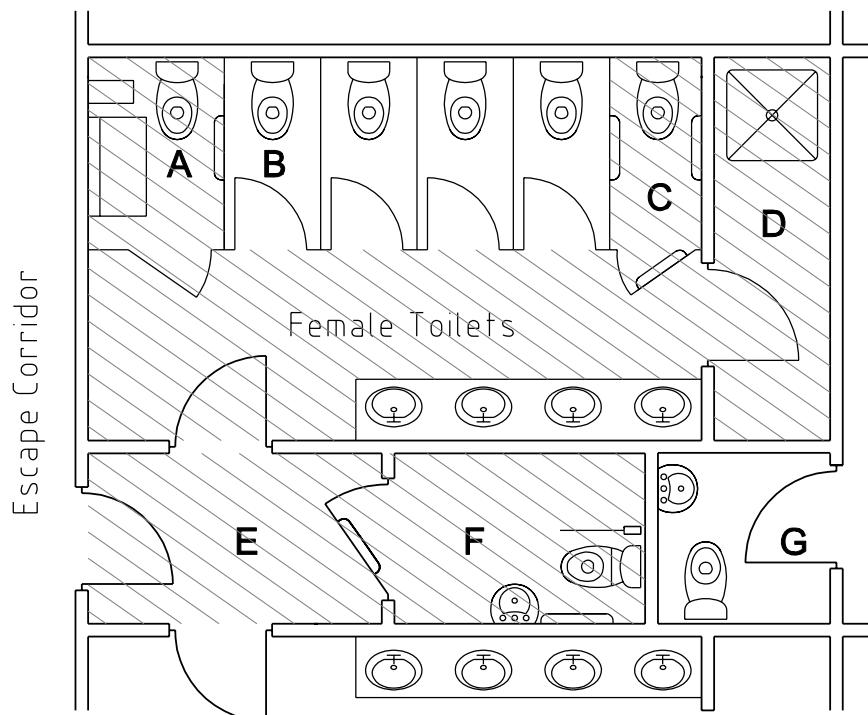
(4) Where it is not possible to determine if an area is a high risk task area, this should be noted on the certificate or report as appropriate.

(5) The person(s) carrying out the annual inspection & testing shall ensure that suitable measures and precautions are taken to safeguard the building occupants. **A1**

Annex E1

(informative)

Emergency escape lighting for toilet areas - typical arrangements



Key	Function & relevant considerations
Diagonal hatching	Denotes areas requiring emergency escape lighting.
Female Toilets	Female Toilets 22 m ² gross floor area. Emergency escape lighting required, 0,5 lux min. An emergency exit sign is required to avoid possible confusion with shower cubicle door.
A	Enlarged WC with baby changing facilities. Emergency escape lighting required, 1 lux min.
B	Standard WC. No emergency lighting required.
C	Ambulant Disabled WC. Emergency escape lighting required, 1 lux min.
D	Shower Cubicle. Emergency escape lighting required, 1 lux minimum.
E	Toilet Lobby 3,9 m ² . Emergency escape lighting required, as per escape routes. Emergency exit sign is required to avoid possible confusion with other doors from the lobby. The emergency exit sign may contribute to meeting the system integrity requirements in A1 8.2 A1
F	Disabled Accessible Toilet. Emergency escape lighting required, 1 lux min.
G	Single Occupancy (able-bodied) Toilet. No emergency lighting required.

NOTE 1 Please refer to *Building Regulations Technical Guidance Document B*, for classifications of buildings by purpose group and use.

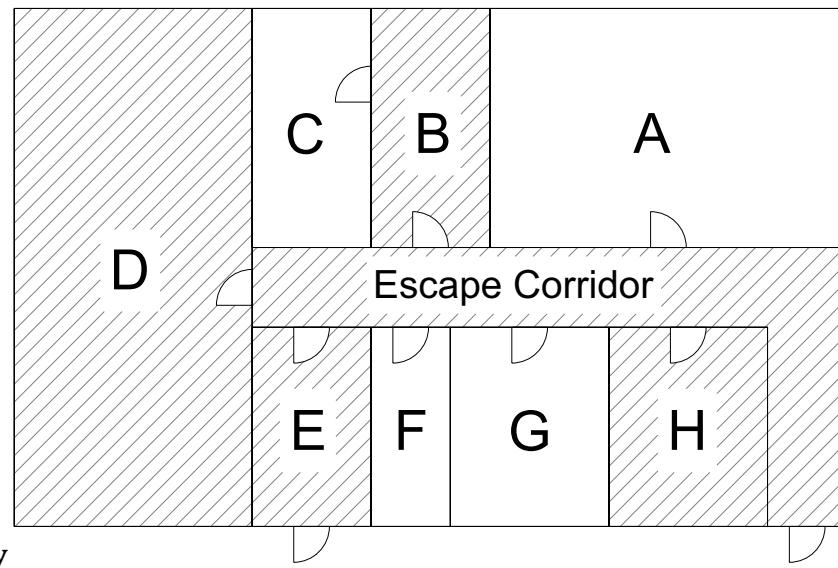
NOTE 2 The emergency lighting arrangements as detailed in Annex E1 are intended for guidance only. The designer should take cognisance of the layout and characteristics of each toilet area when designing the emergency lighting.

Figure [A1](#) E1.1 [A1](#)— Typical arrangements

Annex E2

(informative)

Example of areas requiring emergency escape lighting



Area	Dimensions/Area	Function & relevant considerations	Emergency escape lighting required
Escape Corridor	$15 \text{ m} \times 2 \text{ m}$ + $5 \text{ m} \times 2 \text{ m}$	A corridor leading to emergency exits, emergency luminaries required at changes in direction, emergency exits and immediately outside the building.	Yes
Room A	$6 \text{ m} \times 9 \text{ m} = 54 \text{ m}^2$	Medium open plan office, no risk identified.	No
Room B	$6 \text{ m} \times 3 \text{ m} = 18 \text{ m}^2$	Small office, escape route passes through this open area. This is an Access Room.	Yes
Room C	$6 \text{ m} \times 3 \text{ m} = 18 \text{ m}^2$	Small office, no risk identified. This is an Inner Room.	No
Room D	$13 \text{ m} \times 6 \text{ m} = 78 \text{ m}^2$	Large office, floor area greater than 60 m^2	Yes
Room E	$5 \text{ m} \times 3 \text{ m} = 15 \text{ m}^2$	Small office, escape route passes through this open area.	Yes
Room F	$5 \text{ m} \times 2 \text{ m} = 10 \text{ m}^2$	Store Room, no risk identified	No
Room G	$5 \text{ m} \times 4 \text{ m} = 20 \text{ m}^2$	Medium office, no risk identified	No
Room H	$5 \text{ m} \times 4 \text{ m} = 20 \text{ m}^2$	Small commercial kitchen with High Risk Task Areas identified.	Yes

NOTE 1 Typical factors for consideration when assessing the requirements for emergency escape lighting in a building are high levels of occupancy, an escape route passing through the area or the need to make safe or switch off other equipment before leaving.

NOTE 2 The above example is intended for guidance only. The shaded areas denote the requirement for emergency escape lighting. The extent of the emergency lighting required in room H is specific to the high risk task areas identified.

Figure E2.1 — Room layouts

Emergency Lighting System Model schedule for periodic inspections, tests & servicing due dates

Address of Building.....

NOTE A copy of this schedule should be placed in the emergency lighting logbook. The schedule should be updated with the required information after each three monthly and annual inspection and test. The next required inspection and test should be carried out within \pm 30 days of the due date.

17 A1 J.S. 3217:2013+A1:2017 A1

Annex G

(normative)

Emergency lighting in different types of building

G.1 General

The buildings to which this Standard applies can be divided generally into the purpose groups as classified in the Building Regulations Technical Guidance Document B and as described in G.2 to G.7. Examples of buildings falling within each of these purpose groups are given but these are not necessarily a comprehensive list. In case of doubt, the appropriate class should be agreed with the enforcing authority(s).

Combined or maintained emergency exit signs shall be used in all buildings. Where emergency escape lighting is required, non-maintained or switched-maintained systems of operation shall generally be used unless:

- a) the following occupancy-specific building specifications as detailed in G.2 to G.7 dictate otherwise,
- b) the Designer determines that Combined or Maintained systems of operation are more appropriate to the requirements of the building or structure.

In addition to the requirements for emergency lighting as detailed in this standard the following shall be applied for the specific building types detailed in Annex G.

NOTE Emergency Exit signs may be switched-maintained but should be illuminated at all material times.

G.1.1 The following apply as relevant to all buildings:

- a) persons with disabilities,

The Building Regulations, Technical Guidance Document M addresses access and facilities for the disabled. The designer shall take cognisance of persons with disabilities when designing an emergency lighting system. Reference points shall be:

- ramps,
- designated refuge area within the building and escape stairwells (also known as Fire Service Access Routes),
- final exit discharge point,
- disabled toilets and showers,
- escape facilities (at the top of each landing).

b) temporary accommodation units (TAU's), subject to the building regulations i.e. erected on a site for a period exceeding 28 consecutive days or 60 days in any 12 months shall be provided with emergency escape lighting,

- c) TAU's subject to the Licensing Act irrespective of duration shall be provided with emergency escape lighting,
- d) ~~A1~~ emergency lighting should be provided on external routes as necessary to allow persons to travel safely from final exits to a place of safety. ~~A1~~

NOTE The requirements of 8.4 do not apply to d).

- e) when providing emergency lighting for specialist rooms in any building, e.g. MRI/PET Scan medical rooms, specialist process areas in Industrial facilities, etc, care shall be taken to ensure that, as necessary, proper consultation with the suppliers of the equipment installed is undertaken,
- f) where a building has a passenger lift installed, the lift car shall have emergency escape lighting installed capable of providing illumination for a minimum of 3 h. All buildings that have passenger lifts installed shall have an emergency escape lighting installed, in accordance with this standard, that is capable of providing illumination for a minimum of 3 h,
- g) where any building falls into more than one of the purpose groups, the whole building should be treated in accordance with the most stringent emergency lighting requirements,
- h) 'High-risk Task Areas' areas shall be determined at the design stage and Emergency Lighting shall be provided to meet the potential risk of providing safe illumination for safe shut-down as applied to the risks involved. Areas in this category could include:
 - commercial kitchens,
 - laboratories,
 - process plant,
 - production plant,
 - and others.

G.2 Multi-storey dwellings (Purpose Group 1(c), residential, as defined in TGD-B, 2006)

EXAMPLES Apartment Complex, flats, maisonette.

Emergency escape lighting shall be provided as outlined in G.1 and G.1.1.

It might be desirable to reoccupy the premises as soon as the normal lighting has been restored, or to delay evacuation after the initial failure of the normal supply, if this is permitted. The buildings in this purpose group have a sleeping risk.

Based on these considerations a 3 h minimum duration emergency lighting system shall be installed.

G.3 Health Care Buildings (Purpose Group 2(a), residential institutional, as defined in TGD-B, 2006)

EXAMPLES Hospitals, Clinics, Nursing Homes, Residential Care Facilities for Adults or Children.

Emergency escape lighting shall be provided as outlined in G.1 and G.1.1 above.

In addition, emergency escape lighting shall be provided in the following areas:

- All Habitable rooms $> 30 \text{ m}^2$ and if the room is $> 60 \text{ m}^2$ then the criteria for open areas shall apply (Refer to 8.5.2.7),
- Wards, treatment rooms, bathrooms, toilets, bedrooms, communal rooms, kitchens and Nurses Stations.

People using buildings of this kind might be unfamiliar with their overall layout and/or might be disabled. Furthermore, it might be desirable to reoccupy the building as soon as the normal lighting has been restored, or to delay evacuation after the initial failure of the normal supply, if this is permitted. The buildings in this purpose group have a sleeping risk.

Based on these considerations a 3 h minimum duration emergency lighting system shall be installed.

NOTE 1 In areas involving critical medical tasks, an illuminance level generally equal to that of the normal lighting is strongly recommended. In such areas the emergency lighting should be powered from a central battery or static inverter system and shall be capable of providing Maintained/Sustained emergency lighting for at least 3 h.

NOTE 2 For additional information please refer to HTM 06-01 and HTM 05-02.

G.4 Other residential (Purpose Group 2(b) as defined in TGD-B, 2006)

EXAMPLES Hotels, hostels, guest houses, residential schools and colleges.

Emergency escape lighting shall be provided as outlined in G.1 and G.1.1.

In addition, emergency escape lighting shall be provided in the following areas:

- Dormitories, common rooms, kitchens, all habitable rooms $> 30 \text{ m}^2$, and
- if the room is $> 60 \text{ m}^2$ then the criteria for open areas shall apply (Refer to 8.5.2.7).

People using buildings of this kind might be unfamiliar with their overall layout and/or might be disabled. Furthermore, it might be desirable to reoccupy the premises as soon as the normal lighting has been restored, or to delay evacuation after the initial failure of the normal supply, if this is permitted. The buildings in this purpose group have a sleeping risk.

Based on these considerations a 3 h minimum duration emergency lighting system shall be installed.

G.5 Other non-residential Buildings (Purpose Groups 3, 4(a), 4(b), 6, 7(a), 7(b) as defined in TGD-B, 2006)

EXAMPLES Offices, Shops, Factories, Industrial Building, Storage Facilities, Covered Car Parks.

Emergency escape lighting shall be provided as outlined in G.1 and G.1.1.

In reference to Purpose Group 7 (b) – Covered Car Parks: The pedestrian escape routes from covered car parks shall be easily identifiable and shall be provided with emergency escape lighting.

Purpose Group 7(a), Storage. In general, people using this class of premises can be expected to be reasonably familiar with the layout and safety provisions, and orderly evacuation can normally be

expected in the event of an emergency. Based on these considerations, a 1 h duration emergency lighting system may be installed for these buildings.

All other buildings in G5 shall have a 3 h duration emergency lighting system installed.

G.6 Places of assembly (Purpose Group 5, assembly & recreation, as defined in TGD-B, 2006)

EXAMPLES Theatre, Public Library, Hall, Non-Residential School, Place Of Public Worship, Public House, Restaurant, Sports Pavilion, Stadium, Grandstand, Terminus or Station.

Emergency escape lighting shall be provided in all places of assembly as outlined in G.1 and G.1.1.

People using such premises can be expected to be unfamiliar with the layout. Also, it might be desirable to reoccupy the premises once the normal lighting has been restored or to delay evacuation after the initial failure of the normal supply, if this is permitted.

Based on these considerations a 3 h minimum duration emergency lighting system shall be installed.

However, in addition certain places of assembly have additional specific requirements as outlined:

G.6.1 Places of assembly 'A':

EXAMPLE Swimming Pools.

Swimming pools, and other similar areas, because of the nature of their use, constitute a particular hazard. The minimum level of illuminance in the pool area and along the circulation routes of the pool surrounds and the access routes to diving boards or flumes shall be not less than 5 lux.

G.6.2 Places of assembly 'B'

EXAMPLE Theatre, cinema, radio and television studio to which the public are admitted, concert hall, exhibition hall, meeting hall, public house, restaurants, café, canteen, dance hall, ballroom, nightclub, terminus, casino and bingo hall.

In areas where the normal lighting may be required to be dimmed, under no circumstances shall the emergency exit signage be dimmed or occluded below the minimum levels required by this Standard.

For specific theatrical applications, the emergency exit signage in the performance and/or auditorium space(s) may be permitted to be extinguished/blacked out for a defined period of time, during a performance only, to achieve the condition known colloquially in theatre parlance as dead black out (DBO). However, such a black out facility may only be implemented on the strict understanding that it is at all times fully fail-safe in operation and shall automatically re-illuminate all emergency exit signage following the defined black out period or if an actual power failure occurs. However, notwithstanding all the foregoing any black out facility shall only be implemented with prior consultation and agreement with the enforcing authority(s).

G.7 Building sites

Emergency lighting and escape route lighting shall form part of the temporary lighting system installation of the construction areas of the site. Projects under construction are dynamic environments often changing on a daily basis. It is accepted that it is not possible to install Emergency Escape Lighting in accordance with I.S. 3217 on the construction areas of a construction site, however all reasonable

measures shall be provided to ensure that persons can safely egress the building site or area under construction to a place of safety.

The extent of Emergency Escape Lighting required shall be determined by the Project Supervisor Construction Stage (PSCS) to meet the requirements of the Safety, Health and Welfare at Work Regulations.

In general, people on building sites can be expected to be reasonably familiar with the layout and safety provisions, and orderly evacuation can normally be expected in the event of an emergency.

Based on these considerations, a 1 h minimum duration emergency lighting system may be used for these sites.

Annex H
(informative)

Commissioning

H.1 General

For all new emergency lighting installations, modification of an existing installation or part thereof, the following minimum commissioning checks and tests should be undertaken by the commissioning parties, for the works carried out in order to certify compliance with **[A1]** I.S. 3217:2013+A1:2017 **[A1]**.

Prior to commissioning, the commissioning engineer should endeavour to obtain copies of the following technical documentation:

- a) a set of the following as installed drawings:
 - Emergency lighting layout.
 - Fire alarm layout.
 - Firefighting equipment layout.
 - Refuge area(s) and first aid station layout.
- b) all technical operational manuals, data sheets and details for the system,
- c) all details of the installed emergency lighting system equipment. This should include photometric data for all emergency luminaire types and manufacturer's data sheets for the installed equipment.

H.2 Initial commissioning process schedule

As part of the initial commissioning process determine the following:

- a) are there any particular requirements to **[A1]** I.S. 3217:2013+A1:2017 **[A1]** for the building type,
- b) do all defined escape routes from the building lead to a final place of safety,
- c) all undefined escape routes,
- d) the position and location of any potential hazards on escape routes,
- e) all open (anti-panic) areas in excess of 60 m²,
- f) if there is a need for standby lighting in the building or any part(s) of the building,
- g) if there is a need for high risk task area lighting in the building or any part(s) of the building,
- h) all external escape routes and external assembly areas,
- i) the position of all fire alarm call points,

- j) the position of all fire fighting equipment,
- k) the location of all refuge areas and first aid posts,
- l) the location of all lifts, lift plant rooms and lift shafts,
- m) the location of moving stairways (escalators) and walkways (travelators),
- n) the location of all motor generator, control, switch and plant rooms, and electrical sub distribution boards,
- o) the location of all toilet and toilet lobbies/vestibules,
- p) the location of all habitable rooms in excess of 30 m²,
- q) the location of all pedestrian escape routes in covered car parks,
- r) all other internal or external locations/areas relating to the building not outlined in a) to q), that may require emergency lighting.

NOTE The above items are a non-exhaustive list.

H.3 Emergency lighting commissioning methodology

H.3.1 General

This methodology provides a template for the commissioning different types of emergency lighting systems. The recommendations of H.3.2 are common to all system types in respect of emergency luminaires, emergency exit signs and their application. Subsequent sections deal with the specific requirements of Central Power Systems (CPS), Central Generating Powered Systems (CGPS) and Self-Contained Systems including those with ATS facility.

The commissioner should be competent in all aspects of emergency lighting and have specific training and knowledge of the system(s) to be commissioned, particularly in the case of CPS and CGPS given their critical nature and the significant electrical risks associated with CPS battery sets.

H.3.2 Applicable to all emergency lighting systems

For all emergency lighting systems the following should be carried out:

- a) verify that the IP rating of all emergency luminaires is suitable for the environmental conditions of their location and that this rating has not been compromised by the method of installation,
- b) in the case of re-engineered emergency luminaires verify that:
 - the original IP rating has not been affected,
 - the original electrical Safety Classification (Class I, II, or III) has been retained,
 - mandatory CE marking, manufacturer's brand and the labelling requirements of I.S. EN 60598-2-22 are present.

- c) verify that remote/satellite control gear, if located in excess of 1 m from an emergency luminaire, is wired using a fire resistant cable of the correct rating to satisfy the requirements of this Standard (see 8.2),
- d) verify that all emergency luminaires and emergency exit signs have been correctly installed as per the emergency lighting layout  as installed drawing(s)  and that all emergency exit sign legends comply with the requirements of this standard, are uniform and indicate clearly and unambiguously the designated escape routes,
- e) verify that the emergency lighting luminaires comply with the disability glare limits specified in this Standard with respect to their location, height and orientation,
- f) verify that sub-circuit monitoring is present on all lighting circuits on escape routes and in anti-panic areas such that in the event of failure of supply to the normal lighting, or part thereof, the emergency lighting associated with that area shall operate,
- g) measure and record emergency lighting levels for all internal and external escape routes, anti-panic areas, high-risk task areas and refuge areas. Where possible these measurements should be carried out during the hours of natural darkness and when normal artificial lighting is off.

NOTE 1 If items a), b) and c) are included as part of the emergency lighting certificate of installation.

NOTE 2 If items a), b) and c) are not included as part of the emergency lighting certificate of installation, the commissioner should obtain verification from any of the following to meet the recommendations of H.3.2:

- the designer,
- the installer,
- the supplier of the fittings,
- the manufacturer of the fittings.

H.3.3 Central powered systems (CPS)

In the case of central power systems (CPS) the following should be carried out in addition to H.3.2:

- a) check that the integrity and performance of the CPS is not compromised by its location in relation to other electrical or mechanical systems or plant, particularly in the event of a fire or flood,
- b) measure and record the operational ambient temperature and humidity, for the CPS location,
- c) check that all cells and/or battery sets are in good condition and that there is no evidence of electrolyte leakage,
- d) check that all battery terminal and links are fully tightened and show no signs of corrosion,
- e) check that electrolyte levels in vented cells are correct. Check and record the specific gravities of the electrolyte in each vented cell,
- f) check the rated ampere hour capacity (Ah) and measure and record the conductance (S) and internal impedance (R) for all cells and/or battery sets,

g) check that all wiring and cable joints downstream of the CPS have the correct fire resistance, are correctly segregated from other electrical services and that the method of support and containment would not be compromised in the event of fire,

The following are considered to meet the recommendations of H.3.3:

- A certificate of installation that contains no deviations, issued by the installer of the system with respect to the items in g),
- Checks carried out by the commissioner verifying that the requirements of this Standard are met.

h) check that CPS status indicators and monitors are operating in correct quiescent condition,

i) check that all slave emergency luminaires are correctly wired to their respective CPS sub-distribution board,

j) check that each maintained and /or combined lamp is illuminated,

k) following a 24 h re-charge and a check of CPS status indicators, simulate a primary full duration power failure test, via a appropriate self-resetting test device in accordance with 9.3 and 10.5.2, for the rated duration of the system. Simultaneously check the operational status of the CPS equipment, luminaires and associated battery set(s) to ensure that all CPS equipment and battery set(s) are functioning correctly and all luminaires are illuminated and fully operational,

l) on completion of the primary full duration test check that all CPS indicators and monitors are operating in correct quiescent condition with all associated battery set(s) recharging,

m) carry out a secondary full duration test within a period not greater than 24 h after the primary test and repeat the checks as detailed in k).

H.3.4 Central generator powered systems (CGPS)

In the case of central generator powered systems the following should be carried out in addition to H.3.2:

a) check that CGPS status indicators and monitoring devices are indicating correct quiescent condition,

b) check the fuel level of any associated inbuilt service tank(s) and/or remote bulk tank fuel reservoir(s) as well as lubrication oil and coolant,

c) for standard CGPS simulate a power failure via a conventional self-resetting test device to initiate the start, run and operation at full load, for a period sufficient to visually determine that all emergency luminaires and lamps are illuminated. This test period should not exceed 60 min. Simultaneously check the operational status of the CGPS equipment and associated starting battery set(s),

d) for CGPSs which utilise back up emergency lighting batteries to supply the load in the case of failure of the prime mover, the following actions and checks should be carried out:

- disable the CGPS engine starting system,

- simulate a power failure to the CGPS system, via an appropriate self-resetting test device as detailed in 8.3. For 3 h and 1 h systems simulate a power failure for a minimum period of 30 min and 10 min respectively but not exceeding one quarter of the rated duration,
- check that the changeover from the CGPS normal output to the reserve back-up battery output is functioning normally at full connected load,
- check that all emergency lighting luminaires and lamps are operating,
- on completion of this test, re-enable the CGPS engine starting system,
- simulate a power failure to the system via an appropriate self-resetting test device for at least 60 min so that the engine is allowed to start up in the normal way at full connected load,
- re-check that all emergency lighting luminaires and lamps are operating,
- check the charge/discharge/recharge functions and status of the CGPS starting battery set(s) and back-up battery set(s),
- on completion of this test, re-check that the fuel, lubricant and coolant levels are to the required operational levels and replenish where necessary.

H.3.5 Self-contained emergency lighting systems

In the case of non-maintained, maintained and/or combined emergency lighting luminaires, both conventional and ATS types the following should be carried out in addition to H.3.2:

- a) check that all emergency luminaires are powered up and their LED status indicators are indicating continuous green,
- b) check that emergency lighting lamps in all emergency luminaires and emergency exit signs are operating,
- c) verify that sub-circuit monitoring is present on all emergency lighting circuits,
- d) in the case of a conventional system with manually operated test facility(s) A1 A1 and/or ATS Classification Type S or P, simulate a power failure to each area or
- e) zone, via an appropriate self-resetting test device in accordance with 9.3, to verify that all emergency luminaires and lamps are operating. This test period should be to the rated duration of the system,
- f) In the case of ATS Classification Type ER, Type PER or Type PERC, carry out a full duration test to each area or zone of emergency lighting system via an appropriate self-resetting test device in accordance with 9.3 and 10.5.2, and check the emergency lighting system's status report. This test period should be to the rated duration of the system,

A1 NOTE 1 A1 In the case of ATS system Type ER, Type PER or Type PERC this test may also be manually initiated via the ATS control panel.

- g) on completion of the primary full duration test, check that LED status indicators are indicating continuous green and all emergency luminaires and lamps are operating on the normal supply,

h) in order to check the capability of the emergency lighting system to re-charge fully within 24 h following a full duration test, carry out a second full duration test within a period not greater than 24 h after the primary test.

A1 NOTE 2 **A1** Where it is not possible to visually examine the operation of all emergency lighting luminaires during a test, individual sections or zones of the emergency lighting system should be tested separately until the entire installation has been completed.

H.3.6 Classification of ATS Types

Detailed below are the different formats of ATS with the minimum function according to the SAT type given in Table H.1.

There are different formats of automatic testing systems (ATS). In order to increase the speed and efficacy of the selection process, the following ATS classifications have been developed:

- **Type S:** This is a stand-alone ATS consisting of a self-contained luminaire with a built-in testing facility that provides a local indication of the condition of the luminaire, but still requires all luminaires to be manually inspected, with a manual record made of the information indicated by luminaires.
- **Type P:** The emergency luminaires are monitored and their condition is indicated by a test facility that collects and displays the results of the tests, but requires manual recording of information on the tests.
- **Type ER:** As type P, but the test facility collects results, and data is recorded and logged by the ATS.
- **Type PER:** As types P or ER, but with a collated fault indicator that automatically gives remote indication of failure of any of the luminaires that have been tested.
- **Type PERC:** As type PER, but with the additional features of a central controller, for setting parameters, configuration of the system and the central controlled initialization of the test and where the date, time and duration of the test is defined by the central controller.

Table H.1 — Minimum function according to the ATS type

ATS type/function	Local display of the test result	Remote display of the system test result	Remote display of the luminaire test result	Recording of the results and history
S	Yes	No	No	No
P	Optional	Yes	Optional	Yes
ER	Optional	Yes	Optional	Yes
PER	Optional	Yes	Yes	Optional
PERC	Optional	Yes	Yes	Optional

NOTE A remote display of the system results should have local indication on the luminaires to assist in the identification of the fault.

Annex I

(informative)

Cable support systems

I.1 Commentary on Annex I

This methodology is based on the guidance outlined in BS 476-24 (ISO 6944). The purpose of these standards is to measure the ability of ductwork systems to resist the spread of fire from one fire compartment to another without the aid of dampers. The standards refer to a complete ductwork installation and therefore include joints, supports and the fire stopping through the furnace wall.

The support elements for ductwork systems are similar to those used to support cable containment systems, i.e. anchors, drop rods, horizontal channel bearers, nuts and washers, and have therefore been used as a basis for the methodology given in this annex.

The cross-sectional area of the drop rods should be calculated using the following formula:

$$A = \frac{9,81 \{ W \cdot L_h + W_T \cdot L_h + W_b \cdot L_b + W_r \cdot L \}}{2 \zeta_{\max}}$$

A = cross-sectional area of a drop rod, in square millimetres (mm^2);

h = height of drop rod, in metres (m);

L_b = length of bearer, in metres (m);

L_h = distance between hangar supports, in metres (m);

W = weight of cables per metre, in kilograms per metre (kg/m);

W_b = weight of bearers per metre, in kilograms per metre (kg/m);

W_r = weight of drop rods per metre, in kilograms per metre (kg/m);

W_T = weight of tray or ladder rack per metre, in kilograms per metre (kg/m);

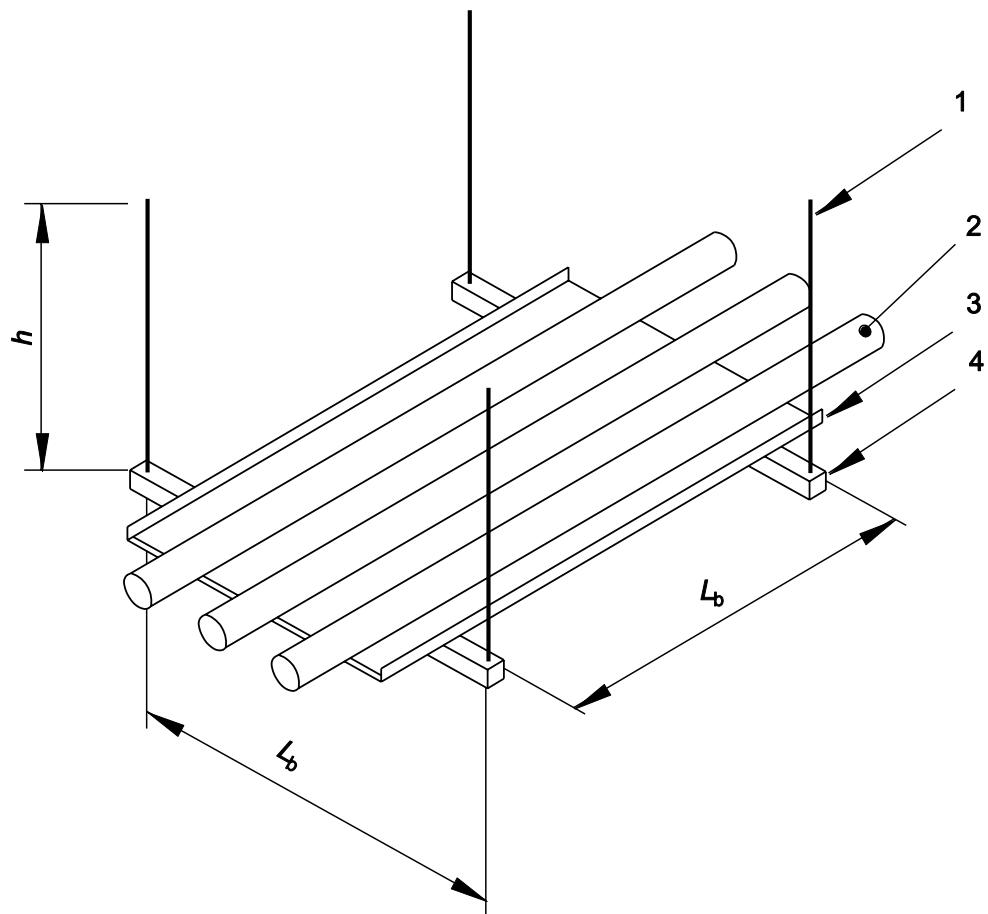
ζ_{\max} = maximum allowable tensile stress, in newtons per square millimetre (N/mm^2).

The elements of the cable support system are shown in Figure I.1.

From information published by manufacturers of fire-rated ductwork, unprotected drop rods and bearers made of steel should be sized such that the calculated stresses do not exceed the values given in Table I.1

Table I.1 — Maximum allowable tensile stress of steel drop rods in fire conditions

Fire duration h	Maximum allowable tensile stress (σ_{max}) N/mm ²
0,5	30
1	15
2	10

**Key**

1. Drop rod
2. Cable
3. Cable tray or ladder
4. Bearer

Figure I.1 — Elements of the Cable Support System

Annex J
(informative)

Model Emergency Lighting Register

Log Reference	Date Identified	Luminaire Number	Luminaire Location	Luminaire Description/System Details	Remedial Action Required	Date Completed	Signed ⁽¹⁾
(1) The register should only be signed when the remedial actions required are completed.							

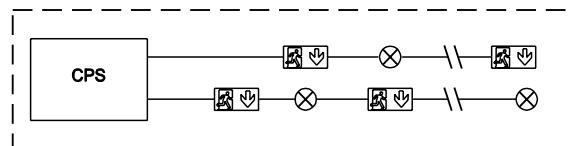
A1

Annex K

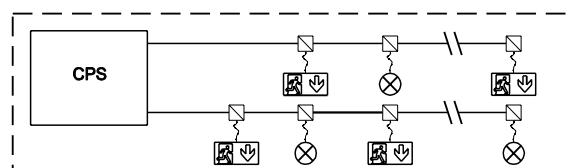
(informative)

Cabling for central power systems (CPS) - Typical arrangements

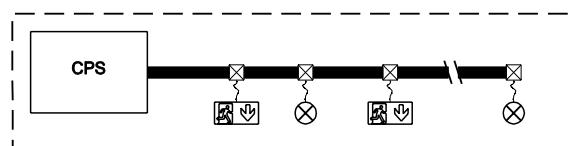
(a)



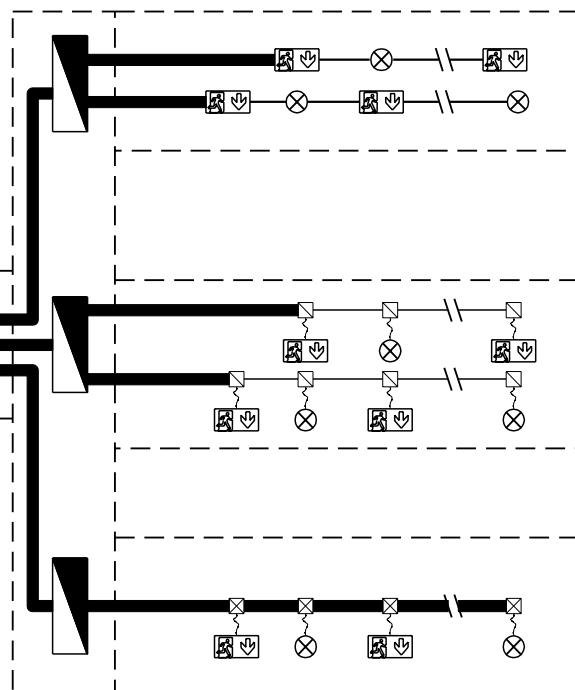
(b)



(c)



(d)



Key

(a)	Direct interconnection of luminaires using two circuits cable 60min. survival time		
(b)	Flexible cable connection to luminaires using two circuits cable 60min. survival time		
(c)	Flexible cable connection to luminaires using one circuit cable 120min. survival time		
(d)	Examples of wiring arrangements for multiple compartments		
—	Cable - 120-minute survival time	█	Emergency exit sign
—	Cable - 60-minute survival time	□	Enclosure [Junction box] 10.3.3
— - -	Boundary of fire compartment	×	Enclosure [Junction box] c/w fused terminal 10.2.2.1 & 10.3.3
⊗	Emergency luminaires	▀	Electrical distribution board

Figure K.1 — Cabling for central power systems (CPS) - Typical arrangements A1

Bibliography

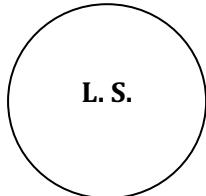
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- [1] Commission Decision on Electrical Safety Supervisory Criteria Document, published by the Commissioner for Energy Regulation ISO 8528-12:1997, Reciprocating Internal Combustion Engine Driven Alternating Current Generating Sets Part 12: Emergency Power Supply to Safety Services
- [2] ISO 8528-12, *Reciprocating internal combustion engine driven alternating current generating sets - Part 12: Emergency power supply to safety services.*
- [3] ISO 17724:2003, *Graphical symbols – Vocabulary.*
- [4] BS 8300:2005, *Design of buildings and their approaches to meet the needs of disabled people, code of practice.*
- [5] BS 5266:1:2011, *Emergency lighting, Part 1: Code of practice for the emergency escape lighting of building.*
- [6] HTM 06-01 HEALTH TECHNICAL MEMORANDUM 06-01 PART A, Electrical services supply and distribution Part B: Operational management
- [7] HTM 05-02 Firecode – fire safety in the NHS Health Technical Memorandum, 05-02: Guidance in support of functional provisions for healthcare premises
- [8] BS 476-24:1987 (ISO 6944:1985), *Fire tests on building materials and structures - Method for determination of the fire resistance of ventilation ducts.*
- [9] S.I. 299:2007, *Safety, Health and Welfare at Work (General Application) Regulations 2007.*
- [10] *Safety, Health and Welfare at Work Act 2005* (No 10 of 2005)

⟨A1⟩

GIVEN under the seal of the National Standards Authority of Ireland

This 21 day of March, 2017



L. S.

Geraldine Larkin

Chief Executive

Patrick Bracken

Secretary to the Board of the NSAI

The Minister for Jobs, Enterprise and Innovation hereby gives his consent under Section 16 of the National Standards Authority of Ireland Act, 1996 to the above declaration.

Nina Brennan

Date: 2017 - 03 - 22

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