The electrical installers’ guide to the
Building (Scotland) Regulations
2021 Edition
The electrical installers’ guide to the
Building (Scotland) Regulations
Certsure
Certsure LLP is a limited liability partnership between the Electrical Safety First and the Electrical Contractors’ Association (ECA) registered in England and Wales. Its brands include NICEIC, the UK’s leading voluntary regulatory body for the electrical contracting industry, which has been assessing the electrical competence of electricians for over fifty years and currently maintains a roll of over 36,000 registered contractors.

Certsure products are delivered through the NICEIC brand. The products include, amongst others:

- The NICEIC Approved Contractor Scheme, a scheme for electrical contractors undertaking design, installation, commissioning and maintenance of electrical installations to BS 7671.
- The Microgeneration Certification Scheme (MCS), developed to assess businesses installing microgeneration technology and is designed to protect the consumer.
- Green Technology schemes for energy saving improvements to dwellings and other buildings.

Electrical Safety First
Electrical Safety First (formerly the Electrical Safety Council) is an independent charity committed to reducing deaths and injuries through electrical accidents at home and at work.
Electrical Safety First is supported by all sectors of the electrical industry, approvals and research bodies, consumer interest organisations, the electricity distribution industry, professional institutes and institutions, regulatory bodies, trade and industry associations and federations, trade unions and local and central government.

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General

The following guide is aimed primarily at NICIEC registered electrical contractors and organisations, but is also applicable to others, who undertake electrical installations in Scotland. It provides guidance on achieving compliance with the mandatory functional standards of the Building (Scotland) Regulations 2004[^1], as amended, which are applicable to the design installation and certification of electrical installation work in Scotland.

The purpose of the Scottish Building Regulations, as defined by the Building (Scotland) Act 2003, is to:

- Secure the health, safety, welfare and convenience of persons in or about buildings and of others who may be affected by buildings or matters connected with buildings.
- Further the conservation of fuel and power.
- Further the achievement of sustainable development, with respect to the design, construction, demolition and conversion of buildings and the provision of services, fittings and equipment in or in connection with buildings.

Prior to undertaking certain types of electrical installation work, legal permission in the form of a building warrant must be obtained by the relevant person; the owner, occupier or developer of the building. The relevant person is responsible for ensuring that any electrical installation work carried out under the warrant complies with the requirements of the Building (Scotland) Regulations 2004.

Exceptions to the warrant process are permitted for certain types of work as listed in Schedule 1 and 3 of the Scottish Building Regulations (refer to Annex 1 of this guide). However, irrespective of whether the electrical work is, or is not, subject to a building warrant all works within the scope of the Building Regulations are required to comply with the regulations.

Regulations from the Building (Scotland) Regulations 2004 that are applicable to electrical installation work are contained in Annex 5 of this guide.

[^1]: Unless otherwise stated, reference in this publication to the Building (Scotland) Regulations 2004 refers to the regulations, as amended.
Scottish Building Standards

The current Scottish building standards system is operated by the Scottish Government Building Standards Division (BSD), formerly the Scottish Building Standards Agency (SBSA), and enforced by local authorities (that is the authority local to where the work is undertaken). The building standards department of the local authority is responsible for independently verifying that all building work subject to a warrant achieves compliance with the relevant requirements of the Building Regulations, and are therefore referred to as the Verifiers of the building standards system.

The role of the Verifier is to protect the public interest by providing an independent check of applications for building warrant to construct or demolish buildings, to provide services, fittings or equipment in buildings, or to convert buildings.

Scottish Ministers have appointed the 32 local authorities in Scotland to act as Verifiers for their own geographical areas.

For the latest information on Scottish building standards refer to: www.gov.scot/Topics/Built-Environment/Building/Building-standards

The certification system

Where electrical installation work is subject to a building warrant, compliance with the Building (Scotland) Regulations 2004 can be achieved using the option of certification. This system is based on the principle that electrically skilled professionals and tradespersons can be responsible for ensuring that electrical installation work complies with the Building Regulations, without the need for detailed scrutiny of designs or inspections by local authority Verifiers, provided they are employed by reputable organisations that operate a system of careful checking.

Certification is promoted by BSD as the recommended route to achieve compliance with the Building Regulations, delivered by Scheme Providers appointed by BSD using schemes approved under Section 7(2) of the Building (Scotland) Act 2003. Currently five certification schemes are in operation, covering electrical installations, building structures, energy, drainage, heating and plumbing.
To support the certification of building warrants, BSD operates and maintains an online certification register, containing the details of all Approved Schemes, Approved Bodies and Approved Certifiers of Construction. The register is an essential tool for Verifiers, allowing them to undertake validation checks on the electrical certificates submitted, whilst also providing a facility for the public to search for a registered firm.

The register can be accessed at: [www.certificationregister.co.uk](http://www.certificationregister.co.uk)

**The NICEIC scheme for the Certification of Construction (Electrical installations to BS 7671)**

**Scheme Provider**

NICEIC is approved by BSD, under Section 7 (2) of the Building (Scotland) Act 2003, to operate a registration scheme for Certification of Construction (Electrical Installations to BS 7671). The scheme allows Approved Certifiers of Construction to certify all aspects of electrical installation construction and commissioning work for compliance with the Building (Scotland) Regulations 2004.

As a condition of registration, the Approved Body must directly employ one or more Approved Certifiers of Construction to deliver the certification services and assign a Certification Co-ordinator to each scheme.
Approved Certifier of Construction

An individual registered with the NICEIC Scheme who is employed or contracted by an NICEIC Approved Body may perform the functions of an Approved Certifier of Construction (Electrical Installations to BS 7671). The Certifier of Construction carries out appropriate inspection and testing during and on completion of the work, and completes a Certificate of Construction to certify that electrical work has been undertaken in compliance with the Building (Scotland) Regulations 2004.

A Certificate of Construction is only valid when issued by an Approved Certifier of Construction, and an Approved Certifier of Construction can only certify work when employed by an Approved Body. The Approved Certifier of Construction may only issue certificates that are countersigned by the Certification Co-ordinator of an Approved Body, and must keep a record of all the Certificates of Construction they issue.

Certification Co-ordinator

This is an individual responsible for countersigning certificates on behalf of an Approved Body. The Certification Co-ordinator acts as the contact point for the Approved Body and is responsible for maintaining the system of checking, insurance policies, access to documents, training and handling complaints.
NICEIC Scheme for the Certification of Construction, approved under Section 7(2) of the Building (Scotland) Act 2003

Scottish Ministers (BSD)

Certification scheme (Construction)

Scheme Provider (NICEIC)

Approved Body (Approved Contractor)

Certification Co-ordinator (either the PDH or QS/Certifier of Construction)

Routes to achieve compliance with the building regulations in Scotland

An organisation not registered with a Scheme Provider is not precluded from carrying out construction work related to a building warrant. It is permitted for a Completion Certificate to be submitted to the Verifier (local authority) that is not supported by a Certificate of Construction. However, before a Completion Certificate that is not supported by a Certificate of Construction can be accepted by the Verifier, additional time may be required for verification of the work to take place.
The non-certified route to compliance

Using this route, the applicant or duly authorised agent submits the building warrant application. The Verifier (local authority) is responsible for checking the design and if satisfied granting permission for the work to commence. The applicant advises the Verifier when work commences, and the Verifier is then responsible for checking the work, during and on completion, for compliance with the Building Regulations. The Relevant Person (applicant or duly authorised agent) submits a Completion Certificate and awaits acceptance by the Verifier.

The certified route to compliance - The NICEIC Certification of Construction Scheme

The NICEIC Certification of Construction Scheme provides a certified route for electrical installation work, subject to a building warrant, to achieve compliance with the Scottish Building Regulations. The process for achieving compliance is illustrated on the following page.

*Note*: BSD issues a Certification Handbook and a Procedural Handbook which provide guidance on achieving compliance with the Scottish Building Regulations. These Handbooks can be downloaded from: [www.scotland.gov.uk/publications](http://www.scotland.gov.uk/publications)
The certified route to compliance – The NICEIC Certification of Construction Scheme

1: The Building Warrant Applicant notifies the Verifier of the intention to use an Approved Certifier of Construction to certify the Electrical Installation under the Scheme and in doing so is eligible for a discount on the warrant fee.

2: The NICEIC Approved Certifier of Construction carries out and/or supervises the electrical installation work during and on completion to ensure compliance with the Building Regulations.

The Certificate of Construction, Electrical Installation Certificate and supporting Checklist are completed via the NICEIC online Certification system (NOCS).

These are available via NOCS as a combined Certificate for convenience. A fully completed combined Certificate is then submitted to the person ordering the work, while the NICEIC Approved Certifier of Construction retains the Checklist and duplicate copies of the electrical certificates issued for auditing purposes.

Note 1: Certificates should also be submitted for work pertaining to a fire detection and alarm system and/or an emergency lighting installation.

Note 2: If the person ordering the work is not the building owner they should pass all NICEIC Electrical Certificates (and where appropriate the relevant fire detection and emergency lighting certificates) to the building owner who should retain them.

2a: NICEIC records the number of NICEIC Certificates of Construction issued and notifies BSD, periodically, of the numbers used.

3: The Building Warrant Applicant submits the Completion Certificate and Certificate of Construction to the Verifier.

4: The Verifier checks the validity of the Certifier of Construction and Approved Body using the BSD online Certification Register, and a valid Certificate of Construction is accepted as evidence of compliance with the Building Regulations, regarding the matters certified.
Work exempt from building warrant requirements and work not requiring a building warrant

**Regulation 3** of the Building (Scotland) Regulations 2004 states that:

‘Regulations 8 to 12 shall not apply to any building or any services, fittings and equipment the whole of which falls into any one or more of the exempted types described in Schedule 1’ (Exempted buildings and services, fittings and equipment). For information on Schedule 1 work refer to Annex 1 of this guide.

**Regulation 5** states that:

‘Any work which consists solely of a building or conversion, including the provision of services, fittings or equipment, of a kind specified in Schedule 3 (Descriptions of building and work including the provision of services, fittings and equipment, not requiring a warrant) shall meet the standards required by Regulations 8 to 12 but shall not, subject to the exceptions and conditions, require a warrant.’ (Annexes 2 and 3 of this guide provide information on Schedule 3).

Schedule 3 to regulation 5 sets the descriptions of building work that do not require a warrant, nevertheless, work not requiring a warrant must still comply with the relevant requirements of the Building (Scotland) Regulations 2004. For this reason, BSD recognises the benefits of using an NICEIC Approved Contractor for work not requiring a building warrant.

In the case of specific like-for-like replacement of items, the work, service, fitting or equipment should be to a standard no worse than existed previously.

**Renewable technology**

A building warrant would not normally be necessary for the installation of a roof-mounted Photovoltaic (PV), or Solar Thermal, microgeneration system on a domestic property comprised of two-stories or less, unless the existing structure needed to be strengthened to accommodate the equipment loadings and fixings, such as the PV panels and brackets. However, for clarification as to whether a warrant is required, it is recommended the Local Authority is contacted.
Photovoltaic (PV) system

**Note:** This exemption is limited to type 1 Schedule 3 of the Building (Scotland) Regulations 2004, as amended, which covers houses with a storey height of not more than 4.5 m.

To obtain financial incentives, such as Smart Export Guarantee (SEG) payments, renewable technology installations rated at under 50 kW (peak output) must be accredited through the Microgeneration Certification Scheme (MCS). This requires registration of both installer and the microgeneration products with an MCS accreditation body such as NICEIC (refer to Section 6 of this guide - Energy).
Conversions

Regulation 4 of the Building (Scotland) Regulations 2004 states that ‘Changes in occupation or use of buildings set out in Schedule 2 (Conversions to which the Regulations apply) shall be conversions to the extent specified in regulation 12.’

Regulation 12 states that ‘Conversion shall be carried out so that the building as converted complies with the relevant requirements of Schedule 6’ (Building Standards applicable to conversions).

With reference to Schedule 2, examples that might be considered conversions subject to the requirements of the Regulations are listed in Annex 4 of this guide.
The Building (Scotland) Act 2003

Within Part 1 of the Building (Scotland) Act 2003, Section 4 deals with guidance documents for purposes of the Building Regulations and Section 5 covers compliance with guidance documents.

In accordance with Section 4 (1), BSD issues two Technical Handbooks on behalf of the Scottish Government; one covering Domestic buildings and the other one covering Non-domestic buildings.

The purpose of the Handbooks is to provide practical guidance on how to achieve compliance with mandatory requirements of the functional standards set out in the Building (Scotland) Regulations 2004.

While the functional standards contained in the Technical Handbooks are mandatory the guidance for achieving compliance is not, and therefore failure to comply with the guidance will not render a person liable to civil or criminal proceedings. However, if the guidance is followed in full then this should be accepted by the Verifier as confirmation of compliance with the Building Regulations (Section 5 of the Building (Scotland) Act 2003 refers). Alternative solutions may be used to achieve compliance with a particular standard(s), but in all cases it is for the Verifier to determine whether the standard has, or has not, been met.

It should be noted that whilst this guide covers the key recommendations of the standards relevant to electrical installations contained in the Technical Handbooks issued by BSD, it is not intended as a substitute for the Technical Handbooks, with which the electrical installer should reference appropriately.

Furthermore, the work that a project involves may be subject to other statutory requirements, such as planning permission, water regulations and licensing. These are not specifically covered in this publication.

Note: The Technical Handbooks can be viewed or downloaded from: www.gov.scot/Topics/Built-Environment/Building/Building-standards
Requirements for Electrical Installations *BS 7671*

Throughout this guide reference is also made to relevant requirements contained within *BS 7671*, as amended, *Requirements for Electrical Installations*. The Health and Safety Executive consider that installations which conform to the standards laid down in *BS 7671*, as amended, are likely to achieve conformity with the relevant parts of: The Electricity at Work Regulations 1989 (*EWR 1989*).

The *EWR 1989*, requires safe working practices to be followed, and guidance on achieving compliance with the regulations is contained in the Health and Safety Executive guidance documents HSR 25 – *Memorandum of Guidance on the Electricity at Work Regulations* and HSG 85 – *Electricity at Work: safe working practices*.

**Guidance on meeting the requirements of the mandatory standards from Schedule 5 of Regulation 9 of the Building (Scotland) Regulations 2004**

Regulation 9 of the Building (Scotland) Regulations 2004 requires construction to be carried out in compliance with the applicable requirements of Schedule 5.

However, not all mandatory standards are appropriate to the work of an electrical installer, so as shown in the following table, only those considered to be relevant to electrical installation work are considered. Including the relevant clause(s) of the Technical Handbooks to which the guidance relates, and where appropriate references to documents that provide further details on the particular aspects covered.
Where any building contains both domestic uses and non-domestic uses, the appropriate parts from each Technical Handbook will need to be used to ensure the standards are complied with in full.

Mandatory standards applicable to electrical installations

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## Mandatory Standard

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**Note:** Other guidance documents, issued under Section 4(1) of the Building (Scotland) Act 2003, are made available on the BSD website, refer to: [www.gov.scot/Topics/Built-Environment/Building/Building-standards/techbooks/techhandbooks](http://www.gov.scot/Topics/Built-Environment/Building/Building-standards/techbooks/techhandbooks)
Glossary of terms used in this guide

**Apartment** – A room in a dwelling not used solely as a kitchen, store or utility room.

**Approved Body** – An organisation that employs at least one approved certifier, operates systems to check compliance with Building (Scotland) Regulations 2004, holds appropriate insurances, provides access for certifiers to keep up-to-date with regulations, codes, guidance and training.

**Note:** In terms of NICEIC enrolment, an Approved Body would be a suitably registered Approved Contractor.

**Building** – Any structure or erection, whether temporary or permanent, other than a structure or erection consisting of, or ancillary to any:

a) public road (including any bridge on which the road is carried)

b) private road

c) sewer or water main which is, or is to be, vested in Scottish Water

d) aerodrome runway

e) railway line

f) large raised reservoir within the meaning of the Reservoirs Act 1975

g) wires and cables, their supports above ground and other apparatus used for telephonic or telegraphic communication.

Any references to a building include references to a prospective building. Any references to a building, structure or erection include references to a part of the building, structure or erection. In relation to the extension, alteration or conversion of a building, references to a building are to so much of the building as is comprised in the extension or the subject of the alteration or conversion.
Building Standards Division BSD – The Scottish Government’s Building Standards Division – formerly the Scottish Building Standards Agency (SBSA).

Building Warrant – The legal permission to carry out building work, convert or demolish a building.

A warrant granted under Section 9 of the Building (Scotland) Act 2003 is required for:

(a) any work for:
   (i) the construction or demolition of or
   (ii) the provision of services, fittings or equipment in or in connection with
   (iii) a building of a description to which building regulations apply

(b) any conversion of a building.

Certification Co-ordinator – An individual registered as responsible for countersigning certificates on behalf of an Approved Body. The Certification Co-ordinator acts as the contact point for the Approved Body and is responsible for maintaining the system of checking, insurance policies, access to documents, training and handling complaints.

Note: In terms of NICEIC enrolment, the role of Certification Co-ordinator would equate to a Principal Duty Holder.

Compartment – A part of a building (which may contain one or more rooms, spaces or storeys and includes, where relevant, the space above the top storey of the compartment) constructed so as to prevent the spread of fire to or from another part of the same building; and compartmented and compartmentation should be construed accordingly.

Compartment floor and compartment wall – A floor or a wall with the fire resistance required to ensure compartmentation.
**Completion certificate** – Is needed to confirm that a building has been constructed, demolished or converted in accordance with the relevant building warrant and to comply with the building regulations. It is the responsibility of the relevant person (usually the owner, tenant or developer).

**Conservatory** – Building attached to a dwelling with a door and any other building elements dividing it thermally from that dwelling and having translucent glazing (including frames) forming not less than either:

a. 75% of its roof area and 50% of its external wall area, or

b. 95% of its roof area and 35% of its external wall area.

**Construction Product Regulation** – Means the instruction of the European Commission to Member States, numbered 305/2011, to regulate so as to remove technical barriers to trade in construction products within the European Economic Area. This regulation requires that products covered by a harmonised European product standard have CE marking.

**Curtilage** – Land area within the same occupation.

**Different occupation** – In relation to two adjoining buildings or parts of one building, means occupation of those buildings by different persons.

**Domestic building** – A dwelling or dwellings and any common areas associated with the dwelling.

This may be sub-divided as follows:

A **house** is a dwelling on one or more storeys, either detached from or forming part of a building from all other parts of which it is divided vertically.
Example of 3 terraced houses (forming part of a building and divided vertically from one another)

A flat is a dwelling on one storey, forming part of a building from some other part of which it is divided horizontally, and includes a dwelling of which the main entrance door and associated hall are on a different storey from the remainder of the dwelling.

Example of a 3 storey block of flats, with the main entrance door and hall located on the ground floor
A maisonette – A dwelling on more than one storey, forming part of a building from some other part of which it is divided horizontally.

Dwelling – A unit of residential accommodation occupied (whether or not as a sole or main residence) by:

a) an individual or by individuals living together as a family, or

b) not more than six individuals living together as a single household (including a household where care is provided for residents).

Residential accommodation includes any surgeries, consulting rooms, offices or other accommodation, of a floor area not exceeding in the aggregate 50 m\(^2\), forming part of a dwelling and used by an occupant of the dwelling in a professional or business capacity.

Fire-stop – A seal provided to close an imperfection of fit or design tolerance between elements, components or construction so as to restrict the passage of fire and smoke through that imperfection. Fire-stopping and fire-stopped should be construed accordingly.

Functional standards – The standards in the Building (Scotland) Regulations 2004 (regulation 9, Schedule 5) that must be achieved as detailed.

High rise domestic building – A domestic building with any storey at a height of more than 18 metres above the ground.

Place of special fire risk – Any place within, or attached to, or on the roof of, a building in which there are installed one or more:

a) solid fuel appliances, with a total installed output rating more than 50 kW, other than kitchen appliances, or

b) oil or gas-fired appliances, with a total installed net input rating more than 70 kW, other than kitchen appliances and forced air convection or radiant heaters in buildings which are neither residential nor domestic, or

c) fixed internal combustion engines, including gas turbine engines, with a total output rating more than 45 kW, or
d) oil-immersed electricity transformers or switch gear apparatus with an oil capacity more than 250 litres and operating at a supply voltage more than 1000 volts, or

e) fuel oil storage tanks having a capacity of more than 90 litres, or

f) paint spray booths or rooms where cellulose or other flammable liquid spray is used.

**Relevant Person** – The relevant person in relation to completion certificates is defined in Section 17(10) of the Building (Scotland) Act 2003 and can be summarised as:

a) the owner, tenant or developer who has done the building work or conversion themselves; or

b) the owner, tenant or developer who has employed a builder to do the work for them; or

c) the owner, where the tenant, developer or builder has not submitted the certificate when they should have done so.

**Residential building** – A building, other than a domestic building, having sleeping accommodation. Examples are hostels, halls of residence and hotels.

**Residential care building** – A building used, or to be used, for the provision of:

a) a care home service; or

b) a school care accommodation service,

**Scheme** – A certification scheme under the terms of Section 7(2) of the Building (Scotland) Regulations 2004. Schemes must be operated by an approved Scheme Provider and must be specific to certain aspects of design or construction. Schemes must not exclude any individual or firm on the basis of membership of a trade association.

**Scheme Provider** – An organisation that operates one or more schemes, to certify compliance with Building (Scotland) Regulations for specified aspects of a project.

The NICEIC is an approved Scheme Provider for Construction (Electrical Installations to BS 7671).
Sheltered housing complex – is defined as:

a) two or more dwellings in the same building; or

b) two or more dwellings on adjacent sites,

where those dwellings are, in each case, designed and constructed for the purpose of providing residential accommodation for people who receive, or who are to receive, a support service; and, for these purposes, ‘support service’ has the same meaning as in the Regulation of Care (Scotland) Act 2001.

Separating floor and separating wall – A floor or wall constructed to prevent the spread of fire between buildings or parts of a building in accordance with Section 2 (Fire) of the Domestic and Non-domestic Technical Handbooks.

Service opening – Any opening to accommodate a duct, pipe, conduit or cable (including fibre optics or similar tubing).

Stand-alone building – Is a building, other than a dwelling, but includes an ancillary building or a part of a building, that is either:

a) detached, or

b) thermally divided from the remainder of the main building and incorporates shut-down control of any heating or cooling system which is linked to any main system, and includes a conservatory.

Storey – That part of a building which is situated between the top of any floor being the lowest floor level within the storey and the top of the floor next above it being the highest floor level within the storey or, if there is no floor above it, between the top of the floor and the ceiling above it or, if there is no ceiling above it, the internal surface of the roof; and for this purpose a gallery or catwalk, or an openwork floor or storage racking, shall be considered to be part of the storey in which it is situated. Upper storey means any storey which is above the level of the ground storey.
Verifier – Appointed to verify that work complies with the Building (Scotland) Regulations 2004, both in terms of design and construction. Scottish Ministers have appointed the 32 local authorities in Scotland to act as verifiers for their own geographical areas. The work of verification will usually be undertaken by their building standards departments.
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Annex
1.1 Effects of notching, drilling, chasing and the like (domestic and non-domestic)

**Mandatory Standard 1.1** – Every building must be designed and constructed in such a way that the loadings that are liable to act on it, taking into account the nature of the ground, will not lead to:

a) the collapse of the whole or part of the building

b) deformations which would make the building unfit for its intended use, unsafe, or cause damage to other parts of the building or to fittings or to installed equipment, or

c) impairment of the stability of any part of another building.

Limits for holes and notches in a floor joist

Electrical installers often need to drill or notch joists for the passage of cables and their enclosures and when carrying out such work it is essential that the building structure is not weakened.

For guidance on small domestic buildings, not more than three storeys, BSD publishes *The Small Buildings Structural Guidance*[^4] (SBSG). Clause 1.F.4 of the SBSG provides guidance on drilling and notching joists, which is based on the comprehensive guidance contained in the now withdrawn standard, *BS 5268-2: 2002 Structural use of timber. Code of practice for permissible stress, design, materials and workmanship*.


A list of structural Eurocodes and the corresponding British Standards to be withdrawn are contained in Annex 1A of the domestic Technical Handbook.

Clause 1.F.4 of the SBSG provides guidance on drilling and notching simply supported floor and flat roof joists, which is based on the comprehensive guidance contained in BS 5268-2: 2002*. Refer to detail A, B and C in the following pages.

Limits for holes and notches in a floor joist

Notches in simply supported floor and flat roof joists should be within the following limits:

- no deeper than 0.125 times the depth of a joist
- not closer to the support than 0.07 of the span
- not further away from the support than 0.25 times the span.

Note: For further information on the structural performance of timbers, refer to the Timber Research and Development Association (www.trada.co.uk).
Holes should be within the following limits:

- no greater diameter than 0.25 times the depth of the joist
- made at the neutral axis (where the joist is under least tension, normally at the centre line of the joist depth)
- not less than 3 diameters (centre-to-centre) apart
- located between 0.25 and 0.4 times the span from the support.

Holes and notches should not be made outside of the above limitations without the approval of a structural engineer.

*Note: Wherever possible, existing holes and notches should be re-used so that the cutting of new holes or notches is minimised.*
Limits of holes in a floor joist, detail B

- Maximum hole diameter of \(0.25 \times\) depth of joist.
- Limits of holes in joist see detail C.

Holes and notches in a floor joist, detail C

- Maximum depth of notch \(0.125 \times\) joist depth.
- Maximum diameter of hole should be \(0.25 \times\) joist depth.
- Holes should be not less than three diameters (centre to centre) apart, and located between 0.25 and 0.4 times the span from the support.
- Notches should be not closer to a support than 0.07 times the span, nor further away than 0.25 times the span.
Roof rafters

To prevent damage to the roof structure, no notches or holes should be cut or modifications made to any roof members (rafters, joists, ceiling ties, hangers, braces and the like) when carrying out any electrical installation work.

Chases (raggles) in the leaf of a cavity wall

Examples of good practice as regards chases (raggles) in a structure are:

- where block masonry is less than 75 mm thick, no chases should be cut,
- where hollow blocks are used, a 15 mm depth of block material should be retained between the back of the chase and a void or voids within the block, and
- where chases are made on each side of a wall, the chases should be offset by a distance at least equal to the thickness of the wall.
Vertical chases should not be deeper than $\frac{1}{3}$ of the wall thickness or, in cavity walls, $\frac{1}{3}$ of the thickness of the leaf, and horizontal chases should not be deeper than $\frac{1}{6}$ of the thickness of the wall or leaf.

**Note:** For domestic installations Clause 1.D.33 of the SBSG refers.

### Requirements of BS 7671

Regulation 527.1.2 requires wiring systems to be installed so that the general structural performance and fire safety of buildings are not reduced.

Section 522.6 of BS 7671 contains requirements for the installation of cables and wiring systems. Regulation 522.6.201 requires that a cable installed under a floor or above a ceiling is routed so that it is not liable to be damaged by contact with the floor, the ceiling or any of their fixings. The regulation also requires that where a cable has to pass through a timber joist within a floor or ceiling construction, or through a ceiling batten, as shown in the following illustration, the cable must either:

1. be at least 50 mm measured vertically from the top, or bottom, of the joist or batten, or
2. comply with Regulation 522.6.204
(Compliance requires that a low voltage (230 V) cable is either installed in an earthed metallic conduit or ducting or is of a type having an earthed metallic sheath, otherwise the cable needs to be protected against mechanical damage.)

Cables in floor joists

Regulation 522.6.202 requires that where a cable is installed at a depth of less than 50 mm from the surface of a wall or partition, that has an internal construction which does not contain significant metal parts, then the cable should be installed in the prescribed zones (shown overleaf) and be provided with additional protection by means of an RCD having the characteristics specified in Regulation 415.1.1 Alternatively, the cable and its installation may be a type conforming to the requirements of Regulation 522.6.204.
The zones detailed in Regulation 522.6.202

Where a cable is concealed within a wall or partition having an internal construction containing significant metal parts, Regulation 522.6.203 requires that irrespective of the depth of the cable from the surface of the wall or partition, the cable shall:

i) be provided with additional protection by means of an RCD having the characteristics specified in Regulation 415.1.1, or

ii) comply with requirements of Regulation 522.6.204.

In addition, for a cable installed at a depth of 50 mm or less from the surface of a wall or partition containing significant metal parts, the requirements of Regulation 522.6.202 are also applicable.
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Annex
2.0.1 Background

Buildings should be designed and constructed to minimise the risk of fire, and if a fire does occur it should be sufficiently restricted to enable occupants to escape safely and fire-fighters to deal with the fire safely and effectively.

2.0.2 Aims

The guidance contained in Section 2 of the Technical Handbooks is intended to achieve the following objectives in the event of an outbreak of fire within buildings:

- protect life
- assist the fire and rescue services
- further the achievement of sustainable development

In view of the particular risks posed by certain types of buildings, such as residential care, hospitals and enclosed shopping centres, additional guidance is contained in Annexes 2.A, 2.B and 2.C, respectively, of the non-domestic Technical Handbook, and is intended to be applied in addition to the guidance provided for the Mandatory Standards 2.1 to 2.15.

Alternative approaches to those provided in the Technical Handbooks are acceptable and in some cases may be necessary, particularly, for buildings outside the scope of the Handbooks or those where evacuation presents particular security issues, such as prisons, detention centres or mental health premises. However, where an alternative approach or solution is used, it should, as a minimum, achieve the same level of safety as the guidance contained in the Technical Handbooks (Clause 2.0.7 refers).

Guidance on fire safety engineering is contained within BS 7974: Application of fire safety engineering principles to the design of buildings.
Alternative approaches to fire safety will not always require the appointment of a fire engineer. In view of this, guidance is provided in the Scottish Building Standards Division (BSD) document: A Simplified Approach To Alternative Fire Safety Strategies, which can be downloaded from www.scotland.gov.uk/bsd

2.0.8 Relevant legislation

Fire (Scotland) Act 2005

For non-domestic buildings, Part 3 of the Fire (Scotland) Act 2005, as amended, requires a fire safety risk assessment to be carried out and continuously reviewed. For a domestic dwelling, a fire risk assessment as detailed in the Fire (Scotland) Act 2005 is generally not necessary (Clause 78(2)(a) refers, but may be required for certain domestic buildings such as houses in multiple occupation (HMOs) or rented premises.

Landlords in the private rented sector are legally responsible for ensuring satisfactory detection and warning of fires is provided and maintained in accordance with the Repairing Standard (Section 13(5) of the Housing (Scotland) Act 2006 refers).

Note: For HMOs that are dwellings the guidance contained in the domestic Technical Handbook should be followed.

A Fire Safety Design Summary (FSDS) should accompany a completion certificate relating to the construction of, or conversion to, a new non-domestic building including extensions to existing buildings. The purpose of the FSDS is to provide those responsible for the fire safety of the building (Responsible person) with information about the fire safety measures that have been incorporated into the building and the fire safety design assumptions that have been made (Regulation 41, of the Building (Procedure) (Scotland) Regulations 2004, as amended, refers).

Note: For further details on the requirements of the Repairing Standard refer to: www.gov.scot/policies/private-renting/dispute-resolution
2.1 Compartmentation (non-domestic)

Mandatory Standard 2.1 – Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, fire and smoke are inhibited from spreading beyond the compartment of origin until any occupants have had the time to leave that compartment and any fire containment measures have been initiated.

2.1.0 Introduction

Dividing buildings into separate fire compartments helps to minimise the spread of fire by providing fire tight sections which form barriers to the products of combustion; smoke, heat and toxic gases. Restricting fire from spreading to other areas of the building not only protects occupants but also protects property. Therefore, it is essential that the integrity of elements forming part of a compartment such as walls, floors and ceilings, are not compromised during building works.

Example of a building divided into fire compartments

Guidance on the maximum area and minimum fire resistance of compartments for both single and multi-storey buildings is contained in Clause 2.1.1 of the non-domestic Technical Handbook (Tables 2.1 and 2.2 refer).

Information for establishing the resistance to fire of a building element or component is contained in Annex 2.D (non-domestic) and Annex 2.A (domestic) of the Technical Handbooks, and is based on the following classification of fire resistant durations, in minutes:

- Short duration - 30 mins
- Medium duration - 60 mins
- Long duration - 120 mins.
2.1.5 Residential buildings

In a residential building, every upper storey (storey above the ground floor) and every basement storey should form a separate compartment.

2.1.6 and 2.1.7 High rise buildings and basements

For high rise buildings, each floor at a storey height of 18 m above ground level should be a compartment floor, and in a building that has a basement storey, the floor of the ground storey should be a compartment floor.

Where the building has one basement and not more than two other storeys, the ground floor is not required to be a compartment as long as no storey has a floor area greater than 280 m\(^2\).

Note: Every basement storey having a depth exceeding 10 m should form a separate fire compartment.

2.1.8 Places of special fire risk

Compartment walls enclosing a place of special fire risk should have a fire resistance of medium duration. A place of special fire risk is any place within in a building (or attached to it) having one or more of the following installed:

a. solid fuel appliances, with a total installed output rating more than 50 kW, other than kitchen appliances, or

b. oil or gas fired appliances, with a total installed net input rating more than 70 kW, other than kitchen appliances and forced air convection or radiant heaters in buildings which are neither residential nor domestic, or

c. fixed internal combustion engines, including gas turbine engines, with a total output rating more than 45 kW, or

d. oil-immersed electricity transformers or switch gear apparatus with an oil capacity more than 250 litres and operating at a supply voltage more than 1000 volts, or

e. fuel oil storage tanks having a capacity of more than 90 litres, or

f. paint spray booths or rooms where cellulose or other flammable liquid spray is used.
Note: This guidance does not apply to a paint spray booth (or to a room where cellulose or other flammable liquid spray is used) where the floor area does not exceed 100 m$^2$, and the booth/room is constructed of prefabricated factory-made panels and satisfies the recommendations contained in the Health and Safety Executive Guidance Note PM25 Vehicle finishing units fire and explosion hazards.

2.1.14 Openings and service penetrations

Openings and service penetrations in compartment walls and floors (including fire resisting ceilings) can pose a significant threat to the fire safety of a building, and as such should be kept to a minimum. Where such penetration is required, the compartment should be fire-stopped in a manner that provides, as a minimum, the same level of protection that was afforded by the un-perforated wall/floor.

For a service opening (other than a ventilating duct) this may be achieved by using:

- a casing which has at least the appropriate fire resistance from the outside, or
- a casing which has at least half the appropriate fire resistance from each side, or
- an automatic heat activated sealing device that will maintain the appropriate fire resistance in respect of the integrity for the wall or floor regardless of the opening size.

For external sealing, various types of fire-stopping solution can be used, including intumescent mastics, compounds, metal sleeves and fire-resistant sponge-filled multi-service boxes.

Example of a fire-resistant sponge-filled multi-service box
Fire-stopping may be necessary to close an imperfection of fit or design tolerance between construction elements and components, service openings and ventilation ducts.

Where services pass through a separating floor or wall, fire-stopping need not be provided for the following:

- a pipe or a cable with a bore, or diameter, not exceeding 40 mm, or
- up to four pipes or cables, having diameters not exceeding 40 mm, that are at least 40 mm apart and at least 100 mm from any other pipe, or
- more than four pipes or cables, having diameters not exceeding 40 mm, that are at least 100 mm apart.

Where differential movement is anticipated, either in normal use or during fire exposure, proprietary fire-stopping products may be used.

The following materials may also be considered appropriate for use: cement mortar; gypsum based plaster; cement or gypsum based vermiculite/perlite mixes; mineral fibre; crushed rock and blast furnace slag or ceramic based products (with or without resin binders).

**Note:** Although a product may carry a ‘fire rating’ this does not necessarily qualify it as a suitable fire-stopping product.

Self-closing fire doors

To prevent fire and smoke spreading from one compartment to another, a self-closing door (a fire door fitted to close automatically from any angle of swing) having a fire resistance duration equivalent to the compartment walls should be installed (Clause 2.1.14 of the Technical Handbook (non-domestic) refers).

A self-closing fire door may be fitted with an electrically operated hold-open device, as specified in BS 5839-3: Fire detection and alarm systems for buildings. Specification for automatic release mechanisms for certain fire protection equipment. However, where an electrically operated hold-open device is installed, it should de-activate on operation of the fire alarm.

The device should de-activate on operation of an automatic fire alarm system, designed and installed in accordance with BS 5839-1, or manual operation of a switch fitted at the door or loss of power to the hold-open device or switch.

Note: A hold-open device should not be fitted to an emergency door, a protected door serving the only escape stair in the building (or the only escape stair serving part of the building) or a protected door serving a fire-fighting shaft.
Requirements of BS 7671

Requirements regarding the selection and erection of wiring systems to minimise the spread of fire are contained in Section 527 of BS 7671 and are divided into the following Regulation Groups:

Regulation Group 527.1 – Precautions within a fire-segregated compartment

This Regulation Group includes the following:

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Summary of the Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>527.1.2</td>
<td>That the installation of a wiring system does not reduce the structural performance or fire safety of the building.</td>
</tr>
<tr>
<td>527.1.4</td>
<td>Cables that pass between fire compartments should comply with the flame propagation requirements of BS EN 60332-1-2. Where they do not comply with BS EN 60332-1-2, they should be limited to short lengths for the connection of appliances.</td>
</tr>
<tr>
<td>527.1.5</td>
<td>No special precautions are required where a trunking or conduit is installed that complies with the resistance to flame propagation requirements identified in Regulation 527.1.5 (such as for example, a type complying with the BS EN 50085 series or the BS EN 61386 series).</td>
</tr>
</tbody>
</table>

Regulation Group 527.2 - Sealing of wiring system penetrations

This Regulation Group includes the following:

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Summary of the Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>527.2.1</td>
<td>Openings around a wiring system, where it penetrates the building fabric, should be fire-stopped to a standard at least equivalent to the unperforated wall, floor, or other similar element.</td>
</tr>
<tr>
<td>527.2.1.1</td>
<td>Temporary sealing arrangements should be provided during erection, as appropriate.</td>
</tr>
</tbody>
</table>
### Regulation 527.2.2
Where a wiring system penetrates a wall, floor, roof or similar, the wiring system should, in addition to any external fire-stopping, be sealed internally to the equivalent standard.

### Regulation 527.2.3
Internal sealing is not required for a non-flame propagating wiring system which has an internal cross-sectional area of less than 710 mm$^2$ (this includes conduits up to 32 mm$^2$) if it satisfies the test requirements of the regulation.

Regulation 527.2.4 requires that any sealing arrangement intended to satisfy the requirements of Regulations 527.2.1 or 527.2.1.1 should provide the same level of protection against external influences as the wiring system in which it is installed and additionally should satisfy the following requirements:

- be resistant to the products of combustion to the same extent as the elements of building construction which have been penetrated, and
- provide the same degree of protection from water penetration as that required for the building construction element in which it has been installed, and
- be compatible with the material of the wiring system with which it is in contact, and
- permit thermal movement of the wiring system without reduction of the sealing quality, and
- be of adequate mechanical stability to withstand the stresses which may arise through damage to the support of the wiring system due to fire.

![Internal sealing of wiring systems (Regulation 527.2.2)](image)
With regard to alteration work, Regulation 527.2.1.2 requires any sealing that has been disturbed to be reinstated as soon as practicable. Reinstatement should use the same types of materials/components as were originally used. Mixing and matching of systems and components is not supported by manufacturers’ fire test data. If the original seal cannot be identified or sourced, the whole seal should be replaced.

Confirmation of the presence of fire barriers, suitable seals and protection against thermal effects is specifically required on the schedule of inspections which forms an integral part of NICEIC electrical installation certificates and condition reports.

**NICEIC certificates and reports**

i) Electrical Installation Certificate

![Image of Electrical Installation Certificate]

ii) Electrical Installation Condition Report

![Image of Electrical Installation Condition Report]
2.2 Separation (domestic and non-domestic)

Mandatory Standard 2.2 – Every building, which is divided into more than one area of different occupation, must be designed and constructed in such a way that in the event of an outbreak of fire within the building, fire and smoke are inhibited from spreading beyond the area of occupation where the fire originated.

2.2.0 Introduction

To minimise the risk of fire spreading, fire separation should be provided between dwellings or between dwellings and common spaces to form a complete barrier to the products of combustion (smoke, heat and toxic gases).

Buildings or parts of a building in different occupation pose particular problems in terms of fire safety, because one occupier usually does not have any control over the activities or working practices of their co-occupiers. In such circumstances, separating walls and separating floors restrict fire growth and thereby give adjoining occupiers more time to escape before they are threatened by fire or smoke.

Separating walls and separating floors should, as a minimum, have a fire resistance of medium duration, but a higher duration may be required in some cases such as, for example, in high rise buildings. For guidance on minimum fire durations refer to Tables 2.1 and 2.2 of the non-domestic Technical Handbook.

Note: A high rise domestic building, is a domestic building with any storey at a height of more than 18 metres above the ground.

2.2.6 and 2.2.4 Combustibility (domestic and non-domestic Technical Handbooks, respectively)

To reduce the risk of a fire starting within a combustible separating wall or a fire spreading rapidly on or within the wall construction:

- insulation material exposed in a cavity should be constructed from materials which are non-combustible or of a low risk classification,
- the internal wall linings should be constructed from materials which are non-combustible or of a low risk classification, and
- the wall should contain no pipes, wiring or other services.
Downlighters (recessed luminaires) installed in ceilings

Although no specific guidance on downlighters is contained in the Technical Handbooks, the integrity of a lining which provides the sole barrier for preventing the spread of smoke and heat into the cavity must be maintained. In view of this, it is recommended that downlighters recessed into ceilings which are intended to provide the fire barrier, such as the plasterboard ceilings in typical domestic premises, are of a type having integral fire protection.

For guidance on the installation of downlighters, and flush mounted accessories, within domestic premises, refer to the Electrical Safety First Best Practice Guide No 5: Electrical installations and their impact on the fire performance of buildings: Part 1 - Domestic premises, which can be downloaded from: www.electricalsafetyfirst.org.uk

Note: For guidance on the fire protection of openings and service penetrations refer to 2.1.14 of this guide.

2.3 Structural protection (domestic and non-domestic)

**Mandatory Standard 2.3** - Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the load-bearing capacity of the building will continue to function until all occupants have escaped, or been assisted to escape, from the building and any fire containment measures have been initiated.

2.3.0 Introduction

The purpose of structural fire protection is to minimise the risk to the occupants, some of whom may not evacuate the building immediately, and to reduce the risk to those engaged in fire-fighting or rescue operations.
2.3.4 Openings and service penetrations

In general, openings and service penetrations in elements of a structure need not be protected from fire unless there is a possibility of structural failure. Where a large opening or a large number of small openings are formed, it should be confirmed that the load bearing capacity of the element of the structure has not been compromised.

Refer to the guidance given in Mandatory Standard 1.1 of this guide.

Requirements of BS 7671

Regulation 527.1.2 of BS 7671 requires the installation of wiring systems to be such that the general structural performance and fire safety of buildings are not reduced.

In particular, as a consequence of early failure of non-metallic cable supports and trunking in the conditions of fire, cables may fall and hang across doorways, corridors and staircases and in doing so obstruct both those escaping and those, such as fire and rescues services, entering the building.

To minimise the risk of cables falling and obstructing escape routes, Regulation 521.10.202 requires wiring systems in escape routes to have suitable fire-resistant supports or retention. In effect, this requirement prohibits the use of non-metallic supports such as plastic cable clips, ties, or trunking as the sole means of support for wiring systems in escape routes, and applies to all wiring systems including data and communications services.

Premature collapse of cables

Irrespective of the installation type (domestic or non-domestic) or size, the requirements of Regulation 521.10.202 apply wherever there is a risk of cables falling and hindering escape or fire-fighting activities.
2.4 Cavities (domestic and non-domestic)

**Mandatory Standard 2.4** – *Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.*

2.4.0 Introduction

A cavity is a concealed space enclosed by elements of a building (including a suspended ceiling) or contained within a building element. A cavity includes a roof space, a service riser or any other space used to run services around a building, but does not include:

- a space within a chute, duct, pipe or conduit, or
- a circulation space, or
- a stair enclosure, or
- a lift well.

The surface(s) of a cavity includes the enclosing envelope including the insulation material but does not include cables, conduits or pipes.

For guidance on minimising the spread of fire and smoke refer to 2.1 of this guide.

2.5 Internal linings (domestic and non-domestic)

**Mandatory Standard 2.5** - *Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the development of fire and smoke from the surfaces of walls and ceilings within the area of origin is inhibited.*

2.5.4 Thermoplastic material

Thermoplastic materials can rapidly increase the fire growth rate and the smoke produced, therefore, the use of thermoplastic materials in ceilings, roof lights and lighting diffusers should be limited and should not be used in protected zones or fire-fighting shafts.
The types of thermoplastic materials referred to in Clause 2.5.4 of the Technical Handbooks are as follows:

- Rigid Thermal Plastic TP(a)
- Flexible Thermoplastic TP(a)
- Semi-rigid Thermoplastic TP(b)

**Note:** A thermoplastic material is any synthetic material that has a softening point below 200 °C when tested in accordance with BS EN ISO 306.

### 2.5.7 Thermoplastic materials in light fittings with diffusers

The use of thermoplastic materials is permitted in light fittings with diffusers. Where the lighting diffuser forms an integral part of the ceiling it should be installed in accordance with the following recommendations:

**Table 2.5 Thermoplastic rooflights and light fittings with diffusers**

<table>
<thead>
<tr>
<th>Classification of lower surface</th>
<th>Protected zone or fire-fighting shaft</th>
<th>Unprotected zone</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any thermoplastic (TP(a) rigid and TP(b))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum area of each diffuser panel or rooflight (m²)</td>
<td>Not advised</td>
<td>No limit</td>
<td>5 m²</td>
</tr>
<tr>
<td>Maximum total area of diffuser panels or rooflights as a percentage of the floor area of the space in which the ceiling is located (%)</td>
<td>Not advised</td>
<td>No limit</td>
<td>15%</td>
</tr>
</tbody>
</table>
### Technical Standard: 2.0 Fire

<table>
<thead>
<tr>
<th>Classification of lower surface</th>
<th>Protected zone or fire-fighting shaft</th>
<th>Unprotected zone</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any thermoplastic</td>
<td>TP(a) rigid</td>
<td>TP(a) flexible and TP(b)</td>
<td>TP(a) rigid</td>
</tr>
<tr>
<td>Not advised</td>
<td>No limit</td>
<td>3 m</td>
<td>No limit</td>
</tr>
<tr>
<td>Minimum separation distance between diffuser panels or rooflights (m)</td>
<td></td>
<td>3 m</td>
<td>3 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Notes:

1. Smaller panels can be grouped together provided that the overall size of the group and the space between any others, satisfies the dimensions shown in the following diagram on layout restrictions.

2. The minimum 3 m separation in the diagram overleaf (see ‘Layout restrictions on thermoplastic rooflights and light fittings with diffusers’) should be maintained between each 5 m² panel. In some cases therefore, it may not be possible to use the maximum percentage quoted.

3. TP(a) flexible is not recommended in rooflights.

### A lighting diffuser forming an integral part of the ceiling

Where lighting diffusers form an integral part of a fire-resisting ceiling, which has been satisfactorily tested, the amount of thermoplastic material is unlimited.
Where light fittings with thermoplastic diffusers do not form an integral part of the ceiling, the amount of thermoplastic material is unlimited provided the lighting diffuser is designed to fall out of its mounting when softened by heat.

A lighting diffuser that does not form an integral part of the ceiling

![Diagram of a lighting diffuser that does not form an integral part of the ceiling]

Layout restrictions on thermoplastic rooflights and light fittings with diffusers

![Diagram showing layout restrictions on thermoplastic rooflights and light fittings with diffusers]

**Note:** An illustration of the layout restrictions on small TP(b) rooflights and light fittings with diffusers is provided in Figure 2.2 of the Technical Handbooks.
Requirements of *BS 7671*

General requirements for protection against fire caused by electrical equipment are contained in Section 421 and now include, under the third amendment of *BS 7671*, a requirement for consumer units and similar switchgear assemblies installed in domestic premises to be manufactured from non-combustible material or be enclosed in a cabinet constructed of non-combustible material (Regulation 421.1.201 refers). A ferrous metal such as steel is an example of a non-combustible material.

The requirement introduced in Regulation 421.1.201, is intended to ensure that if a source of ignition occurs within the enclosure of a consumer unit or switchgear assembly, such as arcing caused by a loose termination for example, it is contained within the non-combustible enclosure and prevented from spreading externally.

On 1st January 2016, it became a requirement for consumer units and similar switchgear assemblies installed in domestic premises to achieve compliance with Regulation 421.1.201.

### 2.9 Escape (domestic and non-domestic)

**Mandatory Standard 2.9** - *Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the occupants, once alerted to the outbreak of the fire, are provided with the opportunity to escape from the building, before being affected by fire or smoke.*

#### 2.9.0 Introduction

Everyone within a building should be provided with at least one means of escape from the effects of fire and smoke, which offers a safe passage to a place of safety, generally, outside the building. The intention is that in the event of fire the occupants can escape safely from the building without the assistance of the fire and rescue service.

The guidance contained in the Technical Handbooks assumes that occupants can move or be moved to a place of safety. An escape route is defined, generally, as a route by which a person may reach a place of safety (refer to Appendix A of the Technical Handbooks)

*Note: For certain types of premises, such as licensed premises, additional fire safety measures may need to be applied.*
DOMESTIC TECHNICAL HANDBOOK

2.9.1 Escape within dwellings – general principles

The time required to escape a building depends on various factors such as, for example, the layout and size of the particular building. Therefore, the scope of the domestic guidance is limited as follows:

- to an area not exceeding 200 m\(^2\) for an individual storey of a dwelling, and
- to those storeys at a depth of not more than 4.5 m below the adjacent ground level, and
- to those buildings with no storey at a height of more than 60 m (approximately 20 storeys) above the adjacent ground.

Table 2.3 of Clause 2.9.2 contains recommendations for escape within dwellings (houses, flats and maisonettes).

Note: For guidance on travel distances, refer to Clause 2.9.3 of the non-domestic Technical Handbook.

Although the occupants of dwellings are likely to be familiar with the building layout and the means of escape they may be sleeping, so a fire detection and alarm system should be provided to give the earliest possible warning of fire (refer to Standard 2.11 of this guide).

2.9.7 Escape within dwellings - open plan option with suppression and enhanced early warning

A dwelling having an open plan layout whereby the height of the highest storey is more than 4.5 m above the adjoining ground, and where the kitchen is remote from the exit door, should be provided with an automatic life safety fire suppression system, designed and installed in accordance with BS 9251* and an enhanced early warning system designed and installed in accordance with BS 5839-6 (Grade D Category LD1).

Note: For shelter housing a Grade C system should be installed (Standard 2.11 refers).

For guidance on automatic fire suppression systems refer to Standard 2.15 of the Technical Handbooks.
NON-DOMESTIC TECHNICAL HANDBOOK

2.9.0 Introduction

In certain circumstances, such as where the travel distance is excessive, a second means of escape should be provided so that occupants can turn away from the fire and make their escape in the other direction.

There may be up to four stages in the process of escape, such as escape from:

- The room of fire origin or escape from the fire where only one direction is possible.
- The compartment of fire origin or until the safety of a fire resisting wall is reached.
- The floor of fire origin to protected zones and escape stairs.
- The building to a place of safety at ground level.

Travel distance, is a measure of the distance that occupants have to travel to reach a protected door, measured along the escape route. Clause 2.9.3 of the non-domestic Technical Handbook provides recommended travel distances for various buildings based on their occupancy profile (Table 2.11 refers).

2.9.5 Head room

An escape route and circulation area should have clear head room of at least 2 m, which in a doorway may be reduced to not less than 1.9 m.

*For the purposes of satisfying Standard 2.9, the limit in the scope of BS 9251 - to buildings below 20 m in height - can be ignored.*
2.9.8 Escape route widths

The width of a passage used as a means of escape also affects the time it takes to escape. To allow occupants to escape safely, the unobstructed width of each individual escape route from a room or a storey should be at least 1.2 m.

Where there is stepped access only, the width may be reduced as follows:

- in buildings with not more than 225 occupants the minimum width may be reduced to 1.1 m, and
- in buildings with not more than 100 occupants the minimum width may be reduced to 1 m.

In view of Clauses 2.9.5 and 2.9.8, electrical installers should give consideration to the height of luminaires and suspended wiring systems, such as trunking and cable tray, and the positioning of electrical switchgear in corridors and stairways of industrial and commercial premises and the communal areas of domestic accommodation.

Note: The aggregate unobstructed width (in mm) of any escape route from a room, or storey, should be at least: 5.3 x the occupancy capacity of the room or storey.

2.9.21 Electric locking devices that unlock on electrical power being withdrawn

Locks on exits doors or locks on doors across escape routes present difficulties when assessing the need for security against the need to allow safe egress from a building in the event of a fire. Security measures however should not compromise the ability of the occupants to escape from a building in an emergency.

Electrically powered locks that unlock on loss of the electrical power, referred to as ‘fail unlocked, electric locks’ may be installed on exit doors and doors across escape routes in buildings which are inaccessible to the general public or, on any door accessible to the general public where the aggregate occupancy capacity of the rooms or storeys served by the door does not exceed 60 persons.

Staff in such areas will need to be trained both in the emergency procedures and in the use of the specific emergency devices fitted.
2.10 Escape lighting (domestic and non-domestic)

**Mandatory Standard 2.10** – *Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, illumination is provided to assist in escape.*

2.10.0 Introduction

In accordance with the Fire Safety (Scotland) Regulations 2006 emergency escape lighting and exit signage may be required in non-domestic buildings and common escape routes in buildings containing flats and maisonettes to assist safe evacuation.

*Note:* Escape lighting is not usually required in dwellings as the occupants are assumed to have a degree of familiarity with the building layout.

2.10.1 Escape route lighting

An emergency escape lighting system should be installed to aid safe evacuation, otherwise every part of an escape route should have artificial lighting supplied by a fire protected circuit that provides a level of illumination not less than that recommended by *BS 5266-1: Code of practice for the emergency escape lighting of premises.*

A protected circuit is a circuit that originates at the main incoming switch or distribution board and whose conductors are protected against fire (Clause 2.10.2 of the domestic and non-domestic Technical Handbooks refer).

Escape route lighting
For escape routes up to 2 m wide, Clause 5.1.1 of BS 5266-1 recommends that the horizontal illuminance on the floor along the centre line of an escape route should be at least 1 lux. Wider routes should be treated as a number of 2 m wide strips, or open area anti panic lighting should be provided.

In addition, Clause 4.2.1 of BS EN 1838-1: Lighting applications - emergency lighting also requires at least 1 lux to be provided along the centre line of escape routes. As the following illustration shows, the central band of the escape route (consisting of not less than half the width of the route) should be illuminated to at least 50 % of that value.

### Minimum values of illuminance along escape routes

**Note:** Some occupants, such as the elderly or those with impaired vision, can require more time to perceive objects and adapt to changes of illuminance, so the level of illuminance provided along the escape route(s) may need to be higher than the minimum values specified in BS 5266-1 and BS EN 1838.
2.10.3 Emergency lighting

Emergency lighting is designed to operate automatically in the event of a local and general power failure, and should be installed according to the building risk assessment. Emergency lighting should be installed in buildings considered to be at higher risk, such as in high rise buildings, buildings with basements or in rooms where the number of people is likely to exceed 60.

In buildings containing flats or maisonettes emergency lighting should be provided in the following areas:

- underground car parks including any protected zone serving it, where less than 30% of the perimeter of the car park is open to the external air, and
- a protected or unprotected zone serving a basement storey, or a protected or unprotected zone in a high rise domestic building.

Lobbies, protected zones and associated escape routes in high rise domestic buildings should be provided with emergency lighting.

Note: For buildings considered to be at increased risk, such as high rise buildings, refer to Clause 2.10.3 of the non-domestic Technical Handbook.

Emergency lighting should be installed in accordance with the relevant requirements and recommendations of the following emergency lighting standards:

- BS 5266-1: Emergency lighting Part 1: Code of practice for the emergency escape lighting of premises, and
- BS EN 1838: Lighting applications. Emergency lighting, and
- BS EN 50172 (BS 5266-8) Emergency escape lighting systems.

The NICEIC and ELECSA publication, snags and solutions Part 4: Emergency Lighting to BS 5266 series (4th Edition), provides guidance on the design, installation, inspection, testing, of emergency lighting systems.
Annex 2.A.4 - Additional guidance for escape lighting in residential care buildings

This guidance recommends that emergency escape lighting is installed in:

- a room with an occupancy capacity of more than ten and any protected zone or unprotected zone serving such a room,
- a protected zone or unprotected zone serving a storey which has two exits, other than a storey in a building not more than two storeys high with a combined floor area of not more than 300 m$^2$ and an occupancy capacity of not more than ten, and
- a protected zone or unprotected zone in a single stair building of two storeys or more and occupancy of ten or more.

Annex 2.B.4 - Additional guidance for escape lighting in hospitals

Essential lighting circuits should be installed throughout a hospital and designed to provide not less than 30 % of the normal lighting level. In an area where a 15 second response time would be considered hazardous, (such as a stairway), emergency lighting should be provided by battery back-up giving a response time of not more than 0.5 seconds.

*Note:* Separate distribution boards or cabinets should be used for essential and non-essential circuits.

Annex 2.C.4 - Additional guidance for escape lighting in enclosed shopping centres with malls

An enclosed shopping centre should be provided with emergency lighting in all mall areas and all zones, protected and unprotected.

*Note:* Emergency lighting should be installed so that it is not rendered ineffective by smoke filled reservoirs.
Certification of emergency lighting systems

On completion of emergency lighting installation work a certificate should be issued to the client confirming that the particular aspects of the installation, such as the design, construction and verification comply with the relevant requirements and recommendations of BS 5266-1 and the associated emergency lighting standards listed previously under Clause 2.10.3 of this guide. For such purposes, NICEIC supplies a multiple (four-part) Emergency Lighting Completion Certificate (ELCC).

For smaller emergency lighting installations a simpler alternative to the multiple ELCC may be used. The NICEIC Emergency Lighting Completion Certificate For small installations and verification of existing installations, based on the model form in Annex G of BS 5266-1, is designed as a single signature certificate for the initial certification of a new emergency lighting installation or for new work associated with an alteration or addition to an existing system, in circumstances where both:

- the design, construction and inspection and testing of the small emergency lighting installation is the sole responsibility of the person/organisation issuing the certificate, and
- the new installation is small, that is comprised of no more than 25 emergency luminaires.

**Note:** The NICEIC Emergency Lighting Completion Certificate For small installations and verification of existing installations may also be used, as the title suggests, for assessing an existing emergency lighting installation, irrespective of the number of emergency luminaires, for compliance with current emergency lighting standards.
Requirements of BS 7671

Electrical installation work associated with an emergency lighting installation, including an alteration or addition to an existing system, should be certified in accordance with BS 7671 using a separate Electrical Installation Certificate or Minor Electrical Installation Works Certificate, as appropriate (Regulations 644.1 and 644.4.201 of BS 7671 refer).

2.11 Communication (domestic and non-domestic)

**Mandatory Standard 2.11** - Every building must be designed and constructed in such a way that in the event of an outbreak of fire within the building, the occupants are alerted to the outbreak of fire.

**DOMESTIC TECHNICAL HANDBOOK**

2.11.1 Fire detection and fire alarm systems

For the purpose of alerting occupants to the outbreak of fire all dwellings should have a Grade D system installed in accordance with BS 5839-6, comprised of at least the following:

- one heat alarm installed in every kitchen,
- one smoke alarm installed in the principal habitable room,
- one smoke alarm in every circulation space on each storey, such as hallways and landings, and
- one smoke alarm in every access room serving an inner room.

An Inner room is a room, other than a kitchen in a dwelling, which does not have a direct access to an exit or direct access to an enclosed circulation area having an exit. Where the inner room has a height of more than 4.5 m the guidance given in Clause 2.9.7 should be followed.

**Note:** A principal habitable room is a room that is used frequently by the occupants of a dwelling for general daytime living purposes.

An example of a Grade D, Category LD2 for a two-storey dwelling having no floor greater than 200 m$^2$

Note: Where a dwelling has an individual storey with a floor area exceeding 200 m$^2$, a fire safety risk assessment should be undertaken to determine the appropriate measures and system required.

Owing to the risk of unwanted (false) alarm common areas and dwellings in buildings containing flats or maisonettes should not be interlinked although for sheltered accommodation monitoring equipment should be provided (Clause 2.11.8 refers).
2.11.2 Choice of fire detector

The type of detector chosen should take into account the risk of unwanted (false) alarms. General guidance on the use of different types of detector is summarised in the following table (Clauses 2.11.3 to 2.11.6 of the domestic Technical Handbook refers).

Types of detectors

<table>
<thead>
<tr>
<th>Type</th>
<th>Standard</th>
<th>Brief summary of recommended use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical smoke detector</td>
<td>BS EN 14604: 2005</td>
<td>Less sensitive to cooking fumes so recommended in spaces near kitchens.</td>
</tr>
<tr>
<td>Ionisation smoke detector</td>
<td>BS EN 14604: 2005</td>
<td>Less sensitive to steam so recommended in spaces near bathrooms/shower rooms.</td>
</tr>
<tr>
<td>Heat detector</td>
<td>BS 5446-2: 2003</td>
<td>Less sensitive to rapidly fluctuating ambient temperatures so recommended in kitchens.</td>
</tr>
</tbody>
</table>

A multi-sensor fire detector may also be used. Such devices, through combining the characteristics of different types of detector can help to reduce unwanted alarms.

*Note:* A heat alarm is not designed to provide warning of the presence of smoke and so should not be used instead of a smoke alarm to prevent unwanted alarm.

Carbon monoxide fire detectors

Carbon monoxide (CO) detectors to BS EN 54-26 may be installed in any room of a dwelling other than a kitchen. They are sensitive to smouldering fires, and generally respond to most fires faster than heat detectors, and are more resistant to environmental influences such dust, steam and cigarette smoke.
However, CO detectors have an anticipated working life of approximately seven years (due to the sensor element requiring replacement), so as expressed in Clause 10.2 (e) of BS 5839-6 CO fire detectors, or multi-sensor detectors incorporating a carbon monoxide sensor, should not be used unless:

- CO detectors are incorporated within a Grade A, B or C system and there is a high likelihood that the system will be subject to periodic maintenance by a competent person at periods not exceeding 12 months, or
- a fault warning is given to indicate the need to replace the electrochemical cell of the detector before it reaches the end of its anticipated life.

**Note:** Carbon monoxide detectors designed to detect fire should not be confused with other types, such as carbon monoxide warning detectors to BS EN 50291, as amended, which are designed to detect the escape of carbon monoxide from faulty or inadequately ventilated appliances (refer to Section 3, Clause 20.20, of this guide).

Detailed guidance on detectors is contained in Section 10 of BS 5839-6.

### 2.11.7 Siting of fire detectors

Smoke alarms should be ceiling mounted and sited at least 300 mm from any wall or light fittings, but not directly above heaters or air-conditioning vents, and should be located in circulation spaces not more than:

- 7 m from the door to a living room or kitchen,
- 3 m from every bedroom door, and
- in circulation spaces more than 7.5 m long, no point within the circulation space should be more than 7.5 m from the nearest smoke alarm.

A smoke alarm located in an access room (which could include a stair and landing), serving an inner room should be not more than 3 m from the door of the inner room.

**Note:** All dimensions should be measured horizontally.
Detectors should be positioned so that they are accessible for maintenance and testing purposes, and should not be sited above staircases or in any other location that may be difficult or unsafe to access.

**Incorrectly sited detector – risk of fall from stretching**
2.11.8 Grade of fire detection and fire alarm system

At least a Grade D fire detection and fire alarm system should be installed in every dwelling in accordance with BS 5839-6. However, any smoke alarm in a dwelling forming part of residential accommodation with a warden or supervisor should have a connection to a central monitoring unit so that in the event of a fire the warden/supervisor can identify the dwelling concerned. As a result, a Grade C system, installed in accordance with BS 5839-6, is recommended for every dwelling of a sheltered housing complex.

*BS 5839-6 Code of practice for design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises.*

The NICEIC publication, snags and solutions Part 5: *Domestic fire detection and fire alarm systems to BS 5839*, provides guidance on the design, installation, inspection, testing, commissioning and maintenance of fire alarm systems within domestic and similar premises.

2.11.9 Wiring and power

A smoke alarm or heat alarm should be permanently connected to a circuit, with the mains supply taking the form of either:

- an independent circuit at the dwelling’s main distribution board, in which case no other electrical equipment should be connected to this circuit (other than a dedicated monitoring device installed to indicate failure of the mains supply to the smoke alarms), or
- an individually (electrically) protected and regularly used local lighting circuit.

*Note: The standby supply for smoke alarms and heat alarms should be sufficient to power the device in the quiescent mode for at least 72 hours and provide a warning for a further 4 minutes or a fault warning for at least 24 hours.*
Interconnection

Smoke alarms and heat alarms installed in dwellings should be interconnected in accordance with BS 5839-6, so that the operation of any one of them causes operation of the alarm signal in all of them.

As recommended by Clause 16.5(c) of BS 5839-6 to avoid the possibility of confusion, any interlinking conductor operating at extra-low voltage, as is usually the case, should be readily distinguishable from those, such as the power supply, operating at 230 V AC.

Identification is normally achieved by colour coding the conductors according to Table 51 of BS 7671.

Identification of interlink conductors

Note: Cables that are used to supply and interconnect the smoke alarm system in a typical dwelling (that is a dwelling with no floor area exceeding 200 m²) are not required to be fire-resistant.
2.11.10 Radio linked systems

Interconnection of the components of a Grade D system may be achieved by the use of radio-links rather than cables (Clause 21 of BS 5839-6 provides guidance).

Certification of fire detection and alarm systems

A certificate should be issued on completion of a fire detection and fire alarm system, or for new work associated with an alteration or addition to an existing system, to provide formal assurance that the system complies with the recommendations of BS 5839-6 and BS 5839-1, as applicable.

The certificate issued to the client must be appropriate for the type of building and Grade of fire alarm system. For such purposes, NICEIC provides a multiple form of certification for a Grade A system, and provides a single certificate to cover a Grade B, C, D, E, or F in domestic premises.

Certificate of Design, Installation and Commissioning of a Fire Detection and Alarm System of Grade B, C, D, E, or F in Domestic Premises

<table>
<thead>
<tr>
<th>PART 1: DETAILS OF THE CONTRACTUAL CLIENT AND INSTALLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration No:</td>
</tr>
<tr>
<td>Employer's Name:</td>
</tr>
<tr>
<td>Address:</td>
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<tr>
<td>Date:</td>
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<tr>
<td>Name of System:</td>
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<tr>
<td>Description of System:</td>
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<tr>
<td>System type:</td>
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<tr>
<td>System grade:</td>
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<tr>
<td>System category:</td>
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<tr>
<td>System class:</td>
</tr>
<tr>
<td>System code:</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PART 2: DETAILS OF THE INSTALLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of System:</td>
</tr>
<tr>
<td>Description of System:</td>
</tr>
<tr>
<td>System type:</td>
</tr>
<tr>
<td>System grade:</td>
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<tr>
<td>System category:</td>
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<tr>
<td>System class:</td>
</tr>
<tr>
<td>System code:</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PART 3: DESCRIPTION OF SYSTEM GRADE AND SYSTEM CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade A System:</td>
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<tr>
<td>Grade B System:</td>
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<tr>
<td>Grade C System:</td>
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<tr>
<td>Grade D System:</td>
</tr>
<tr>
<td>Grade E System:</td>
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<tr>
<td>Grade F System:</td>
</tr>
</tbody>
</table>

**Note:** The abbreviated version of the fire detection and alarm system certificate should be issued with the installation certificate (BS 5839-6). This certificate should include a certificate of testing and inspection, as described in BS 5839-6. The certificate should also include a certificate of commissioning, as described in BS 5839-6. The certificate should include a certificate of design, installation, and commissioning, as described in BS 5839-6. The certificate should include a certificate of testing and inspection, as described in BS 5839-6. The certificate should include a certificate of commissioning, as described in BS 5839-6. The certificate should include a certificate of design, installation, and commissioning, as described in BS 5839-6.
Additional requirements for rented and owned homes

Under new regulations, by 1st February 2022 every home in Scotland must meet the ‘Tolerable Standard’.

Legislation has recently passed and from 1st February 2022 all homeowners in Scotland will have to meet the new standards for fire and smoke detection regardless of the property tenure.

The standards being introduced already apply to all private rented sector homes meaning all landlords and letting agents acting on their behalf should by now be meeting these standards before renting out their properties.

Through the: Housing (Scotland) Act 1987 (Tolerable Standard) (Extension of Criteria) Order 2019, allowance has been made to permit tamper proof long-life lithium battery alarms to be installed or mains-operated alarms with battery backup.

Regardless of the type installed all smoke and heat detectors must be interlinked.

From the implementation date, in all properties there must be:

- A smoke alarm installed in the room used most for general daytime living, such as the living room or lounge;
- A smoke alarm for every hallway and landing on each storey of the property;
- A heat alarm in every kitchen;

All smoke and heat alarms must be ceiling mounted and interlinked throughout the property.

Homeowners who do not comply could be subject to comments about the properties non-compliance on any home report or receive an order from the relevant Local Authority requesting they bring the property up to standard.
NON-DOMESTIC TECHNICAL HANDBOOK

2.11.0 Introduction

Early warning of a fire increases the probability of achieving safe evacuation of buildings by assisting owners and occupiers of buildings to implement their fire safety policy and emergency fire action plan.

In a small single storey, non-residential, building the means of raising the alarm could be as simple as a warning call from the person discovering the fire, but in more complex buildings a sophisticated fire detection and fire alarm system may be required and should always be based on the particular fire risk assessment.

Note: A fire risk assessment is a requirement of the Fire (Scotland) Act 2005 (Section 78 of the Act refers).

It is important to note that as a consequence of poor, design, installation or maintenance of automatic fire detection and alarm systems, around 97% of all automatic calls received by the fire and rescue service result in unnecessary attendance due to unwanted (false) alarms.

Guidance on how to assess and reduce the risks of unwanted alarm is provided in: BS 5839-1: Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises.

Alternative approaches to those provided in the Technical Handbooks may be used, and in buildings of a complex design may be the only practical solution to achieving compliance with the functional standards (Clause 2.0.7 of the non-domestic Technical Handbook refers). However, irrespective of the measures used to achieve compliance, those responsible for the safety of the building should be made aware of the importance of maintaining the system to ensure it operates effectively.

To support the person responsible for the safety of the premises (Responsible person) a Fire Safety Design Summary (FSDS) should accompany a completion certificate relating to the construction of, or conversion to, a new non-domestic building, including extensions to existing buildings.
2.11.3 Categories of fire detection and fire alarm system

At the design stage it is important to take into account the building evacuation factors, in order to specify the alarm category. Life safety fire alarm systems installed in a building will be one or more of the following categories.

**Category L** systems are automatic fire alarm systems installed for the protection of life, incorporating detectors, sounders and manual call points installed in the building. Category L fire alarm systems are sub-divided from the most stringent L1 to the least stringent requirement L5.

**Category M** is a standalone manual fire alarm system that includes manual call points and sounders at specific locations in the building. Automatic detection is not part of the system. Nevertheless Category M systems should be installed in conjunction with L1, L2, L3, L4, L5 and voice alarm systems.

2.11.4, 2.11.5 and 2.11.12 Residential care buildings, hospitals and enclosed shopping centres

These buildings present increased risks, so an automatic fire detection and alarm system designed and installed in accordance with BS 5839-1 should be installed in every residential care building, hospital and enclosed shopping centre.

Specific guidance is provided in the Annex of the Technical Handbook (non-domestic) as follows:

- Annex 2.B - Hospitals
- Annex 2.C - Enclosed shopping centres
2.11.6 Shared residential accommodation

As a minimum recommendation, a Category LD2 (Grade D) system should be installed in shared residential accommodation that is designed to provide sleeping accommodation for not more than 10 persons, entered from open air at ground level and having no sleeping accommodation at a storey height of more than 7.5 m.

2.11.7 Residential buildings (other than residential care buildings and hospitals)

In residential buildings, such as hotels and boarding houses, occupants are at increased risk should fire occur because they are more likely to be unfamiliar with the accommodation or escape routes.

Although a Category L2 system is likely to be appropriate for the majority of sleeping accommodation premises, it is important that the choice of system category is based on a risk assessment of the particular circumstances.

2.11.8 Entertainment buildings and assembly buildings

The category will be dependent on the use of the building, whether it is cinema, restaurant or nightclub, so a fire safety risk assessment should be carried out at the design stage to determine the appropriate category.

The following is a guide only.

As a minimum where there are:

- more than 300 occupants then a Category L1 system should be installed.
- no more than 300 occupants, but more than 100, then at least a Category L2 system should be installed.
- no more than 100 occupants, but more than 60, then at least a Category L3 system should be installed.
- no more than 60, then at least a Category M system should be installed.
2.11.9 Offices and shops

In offices, the occupants should be alert and familiar with the building layout, so a manually operated Category M system that can be heard throughout the building when operated from a manual call point may be all that is required.

In shops, the occupants may not be familiar with the layout and so, as a minimum, Category M, L3 or L4 systems should be installed as follows:

- for buildings having more than 300 occupants, or having different occupation a Category L3 system.
- for buildings having not more than 300 occupants but more than 100 a Category L4 system.
- for buildings having not more than 100 occupants a Category M system.

2.14 Fire and rescue service facilities (domestic and non-domestic)

Mandatory Standard 2.14 – Every building must be designed and constructed in such a way that facilities are provided to assist fire-fighting or rescue operations.

2.14.0 Introduction

Facilities including smoke clearance plant and equipment may need to be provided to assist fire service personnel to rescue persons or fight fire.

2.14.6 Heat and smoke control

Ventilation of escape stairs, protected lobbies and common access corridors is an important measure to assist fire service personnel whilst fire-fighting and for smoke clearance purposes after the fire has been extinguished. The efficiency of the ventilators is dependant upon the prevailing wind conditions and it is important that fire service personnel can control the opening and closing of the ventilators.
For escape and fire-fighting stairs, a ventilator of at least 1 m$^2$ should be provided at the top of every stairway, or a ventilator of 0.5 m$^2$ at each storey (installed on an external wall), or alternatively smoke shafts designed to BRE, 2002 - *Smoke shafts protecting fire-fighting shafts*[^6], should be provided.

For fire-fighting lobbies, unless excluded by Cause 2.14.2, a ventilator of at least 1 m$^2$ should be provided at each storey (on an external wall), or smoke shafts designed to BRE, 2002 should be provided.

With the agreement of the fire and rescue service, a natural or mechanical smoke ventilation system used to satisfy Standard 2.9 may also be used to satisfy Standard 2.14.

[^6]: Smoke shafts protecting fire-fighting shafts: their performance and design (BRE, 2002).
Introduction
1. Structure
2. Fire
3. Environment
4. Safety
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6. Energy
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Annex
3.3 Flooding and groundwater (domestic and non-domestic)

Mandatory Standard 3.3 - Every building must be designed and constructed in such a way that there will not be a threat to the building or the health of the occupants as a result of flooding and the accumulation of ground water.

3.3.0 Introduction

The Scottish Environment Protection Agency (SEPA) estimates that 1 in 22 homes in Scotland are at risk of flooding (www.sepa.org.uk). Therefore, in areas where there is a risk of flooding it is good practice to have procedures in place.

3.3.2 Flood risk assessment

The risk of flooding should be assessed, so attention is drawn to the guidance given in the Scottish Planning Policy 7: Planning and Flooding (SPP 7) and construction industry guidance (C624). These documents can be downloaded from the Scottish Government website: www.Scotland.gov.uk

Although no specific guidance is included in the Technical Handbooks regarding electrical installations in areas at risk of flooding, the UK document, Preparing for Floods (www.odpm.gov.uk), contains the following recommendations to minimise the damage to electrical installations in new and refurbished properties in areas at risk of flooding:

- Raising the meter and consumer unit to a height above the expected flood level (subject to approval by the electrical distributor, unless private).
- Raising the height of socket-outlets (and other accessories commonly installed at low level such as cooker-outlet plates).
- Installing wiring serving ground floor circuits in the first floor void with drops descending to individual accessories.
- Installing wiring in plastic conduit as opposed to plastering cables directly into walls, and providing drainage at low points in conduits where water is likely to collect in the event of flooding.

Note: The installation of conduit is also likely to reduce the amount of rewiring work required following a flood.
3.10 Precipitation (domestic and non-domestic)

**Mandatory Standard 3.10** - *Every building must be designed and constructed in such a way that there will not be a threat to the building or the health of the occupants as a result of moisture from precipitation penetrating to the inner face of the building.*

Persons carrying out electrical installation work should take reasonable steps to minimise any detrimental effects that may occur as a result of bridging between the outer surface and the inner surface of buildings. For such reasons, cables should not be routed in external cavity walls and holes passing from the interior to the exterior of the building, such as those used for the installation of cables, containment and extract fans, should be suitably sealed (refer to Clause 2.1.4 of this guide - *Openings and service penetrations*).

3.11 Facilities in dwellings (domestic)

**Mandatory Standard 3.11** - *Every building must be designed and constructed in such a way that:*

a. *the size of any apartment or kitchen will provide a level of amenity that ensures the welfare and convenience of all occupants and visitors, and*

b. *an accessible space is provided to allow for the safe, convenient and sustainable drying of washing.*

*Note:* This standard applies to a dwelling only.

3.11.3 Kitchens

Where a solid fuel cooker is not installed, a space for a gas, electric or oil cooker shall be provided, which is of sufficient size to include any piping, cables or other apparatus required to enable the appliance to be used.

*Note:* Sufficient space (1 m activity space) should be provided to allow a cooker to be accessed and used safely (Figure 3.30 of the domestic Technical Handbook refers).
Requirements of *BS 7671*

Regulation 537.3.1.1 requires a means of switching off the power to the cooker to be provided, so as to facilitate mechanical repair or cleaning. Although no specific distance is stated in *BS 7671*, for ease of access the cooker control switch should be positioned locally to the cooker, as a guide, within 2 m.

### 3.13 Heating (domestic)

**Mandatory Standard 3.13** - *Every building must be designed and constructed in such a way that it can be heated and maintain heat at temperature levels that will not be a threat to the health of the occupants.*

*Note: This standard applies to dwellings only.*
3.13.1 Heating recommendations

Every dwelling should have some form of fixed heating system, or some means of heating that is capable of maintaining a temperature of 21 °C in at least 1 apartment (room) and 18 °C elsewhere, when the outside temperature is minus 1 °C. This does not apply to temperatures in storage rooms having a floor area not exceeding 4 m².

*Note:* Heating systems should be energy efficient, refer to Section 6 – Energy.

3.14 Ventilation (domestic and non-domestic)

**Mandatory Standard 3.14** - Every building must be designed and constructed in such a way that ventilation is provided so that the air quality inside the building is not a threat to the building or the health of the occupants.

3.14.0 Introduction

Adequate means of ventilation is required in buildings to supply and maintain good air quality. It should be noted that the guidance provided under Standard 3.14 in the Technical Handbooks is for the purposes of human respiration and is in addition to, and separate from, ventilation required for other purposes such as that required for ventilation of fire escape routes.

DOMESTIC TECHNICAL HANDBOOK

3.14.1 Ventilation generally

Ventilation of dwellings is necessary to remove stale air, excess vapour and pollutants, and may be achieved by either natural or mechanical means (or a mixture of both). In particular, ventilation should be provided in areas that generate higher levels of moisture during normal use, such as kitchens, bathrooms and utility rooms.

Ventilation is not required in a room used for the purpose of cold storage or in a room having a floor area of less than 4 m², unless it is a kitchen or utility room.
Background ventilators and intermittent extract fans

3.14.2 Ventilation awareness in dwellings

A proportion of air movement within buildings is fortuitous, as uncontrollable air escapes through gaps and cracks within the structure to the outside atmosphere. However, building techniques and products designed to improve the energy efficiency of homes (as detailed in Section 6 ‘Energy’ of this guide) are designed to reduce the rate at which air escapes (known as the infiltrating air rate) through building structures. Consequently, to maintain carbon dioxide (CO\textsubscript{2}) levels at safe levels in modern energy efficient homes a greater reliance should be placed on ‘purpose provided ventilation’

In view of this, where a dwelling has infiltrating air rates of less than 15 m\textsuperscript{3}/hr/m\textsuperscript{2} @ 50 Pa, it is recommended that monitoring equipment is provided in the main or principal bedroom to provide occupants with information on the CO\textsubscript{2} levels present in their home. The monitor should incorporate a simple visual indicator and be capable of recording and displaying readings within a range of at least 0 – 5 000 parts per million and logging data at intervals 15 minutes, or less, over a 24 hour period.

The occupants should be made aware, based on the results of the data, whether improvements to the existing ventilation provision are required, and if so, offered guidance on achieving the improvements needed.
Siting of a CO₂ detector head

Where a CO₂ detector head is ceiling mounted it should not be installed within 300 mm of any wall, and where wall mounted, it should not be installed within 150 mm of the ceiling or a junction with another wall. Furthermore, a CO₂ detector head should not be located:

- where it can be obstructed (for example by curtains, blinds or furniture), or
- next to a door or window, or
- next to an air vent or similar ventilation opening, or
- within 1 m of the expected location of a bed-head.

The mounting height of the carbon dioxide monitor, with or without an integral detector, should be between 1.4 m and 1.6 m above the finished floor level.

**Note:** The monitor and detector head may be located in different rooms.

For more detailed information on the provision of ventilation in dwellings, refer to the BSD guidance document: *Domestic Ventilation 2015*, which can be downloaded from: [https://www.gov.scot/publications/building-standards-list-of-guidance/pages/key-supporting-technical-guidance/](https://www.gov.scot/publications/building-standards-list-of-guidance/pages/key-supporting-technical-guidance/)

### 3.14.3 Ventilation of dwellings

Ventilation is the process of removing air from within an enclosed space and replacing it with air from outside the building. It can be provided using natural methods such as windows, trickle ventilators and passive stack ventilators or by using mechanical ventilation devices or systems.

**Note:** A trickle ventilator is a small ventilation opening, normally in the head of a window frame, with a controllable shutter to allow fine control of air movement.

A trickle ventilator should be provided in an area containing mechanical extraction to provide replacement air and ensure efficient operation when doors are closed. However, the trickle ventilator should be independent of the mechanical extract so that replacement air can be provided when the extract fan is operating (Clause 3.14.6 of the domestic Technical Handbook refers).
Recommendations for the ventilation of dwellings shown in the following table are based on the size of the ventilation opening. For trickle ventilation the values shown have been made on the basis that infiltrating air rates of 5 to 10 m$^3$/h/m$^2$ at 50 Pa should be achieved in all modern dwellings. Where the infiltrating air rate is less than 5 m$^3$/h/m$^2$ at 50 Pa, it may give rise to problems with air quality (Clause 6.2.4 of this guide refers).

### Recommended ventilation for dwellings

<table>
<thead>
<tr>
<th>Space to be ventilated</th>
<th>Ventilation recommendations</th>
<th>Trickle ventilation$^{[1]}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartment</td>
<td>A ventilator with an opening area of at least $1/30$th of the floor area served.</td>
<td>12 000 mm$^2$</td>
</tr>
<tr>
<td>Kitchen</td>
<td>Either:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a) mechanical extraction capable of at least 30 l/sec (intermittent) above a hob$^{[3]}$, or</td>
<td>10 000 mm$^2$</td>
</tr>
<tr>
<td></td>
<td>b) mechanical extraction capable of at least 60 l/sec (intermittent) if elsewhere$^{[3]}$, or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) a passive system stack ventilation system$^{[4]}$.</td>
<td></td>
</tr>
<tr>
<td>Utility room</td>
<td>Either:</td>
<td>10 000 mm$^2$</td>
</tr>
<tr>
<td></td>
<td>a) mechanical extraction capable of at least 30 l/sec (intermittent)$^{[3]}$, or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) a passive stack ventilation system$^{[4]}$.</td>
<td></td>
</tr>
<tr>
<td>Bathroom or shower room (with or without a WC)</td>
<td>Either:</td>
<td>10 000 mm$^2$</td>
</tr>
<tr>
<td></td>
<td>a) mechanical extraction capable of at least 15 l/sec (intermittent), or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) a passive stack ventilation system$^{[4]}$.</td>
<td></td>
</tr>
<tr>
<td>Toilet</td>
<td>Either:</td>
<td>10 000 mm$^2$</td>
</tr>
<tr>
<td></td>
<td>a) ventilator with an opening area of at least $1/30$th of the floor area served, or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) mechanical extraction capable of at least 3 air changes per hour</td>
<td></td>
</tr>
</tbody>
</table>
Continuous mechanical extract
Space to be ventilated | Ventilation recommendations | Trickle ventilation[^1]
---|---|---

Notes:

1. Where the trickle ventilator is ducted, the recommended areas in the table should be doubled (Clause 3.14.6 refers).
2. The overall provision of trickle ventilation in a dwelling may be provided at an average of 11 000 mm$^2$ per room with a minimum of 11 000 mm$^2$ for each apartment.
3. Where an extract fan is fitted in a building containing an open-flued combustion appliance, extract rates should be reduced (refer to the guidance given under Mandatory Standard 3.17 of the Technical Handbooks).
4. For guidance on a passive stack ventilation system installed in a building containing flats and maisonettes refer to Section 2: Fire, of the Technical Handbooks.
5. Long duct runs, flexible ducting and bends can reduce fan performance and should be carefully considered during design. Guidance on the installation of ducting is contained in the BSD Guide: Domestic Ventilation 2015.

Where infiltration rates in a dwelling exceed 10 m$^3$/h/m$^2$ at 50 Pa, this may often be the case in existing buildings, the values for trickle ventilation shown in the table may be reduced as follows:

- apartments - 8 000 mm$^2$
- all other rooms - 4 000 mm$^2$

Alternatively, the overall provision of trickle ventilation may be provided at an average of 6 000 mm$^2$ per room, with a minimum provision of 4 000 mm$^2$ in each apartment.

**Note:** An apartment is a room in a dwelling not used solely as a kitchen, store or utility room, or sanitary accommodation.

### 3.14.5 Ventilation of areas designated for drying of washing

A space, other than a bathroom or utility room that is used for drying clothes, should have mechanical extraction capable of at least 15 l/sec (intermittent) or a passive stack ventilation system should be installed.
Note: The extract fan should be connected to a humidistat set to activate at a relative humidity of between 50 and 65%.

3.14.9 Mechanical Ventilation

Mechanical ventilation of dwellings should be provided to the outside air, but may be routed through a duct or heat exchanger, in accordance with Section 2 of CIBSE Guide B: 2005 Heating, Ventilating, Air conditioning and Refrigeration.

Mechanical extract system

3.14.11 Mechanical ventilation and systems

As a result of lower infiltration rates, mechanical ventilation may be necessary to provide a healthy living environment. This may be achieved by, for example:

- A mechanical ventilation and heat recovery system (MVHR) installed in accordance with BRE Digest 398.
- A centralised mechanical extract ventilation system (MEV) installed in accordance with BRE Digest 398.
In buildings where an infiltration rate of not less than $3 \text{ m}^3/\text{hr}/\text{m}^2$ @ 50 Pa is expected, decentralised mechanical extract ventilation units (dMEVs) in accordance with the following minimum extraction rates, are recommended for rooms that are likely to have a high humidity, such as kitchens, and rooms containing a shower or bath.

**Minimum continuous extraction rates for dMEVs**

<table>
<thead>
<tr>
<th>Area</th>
<th>Minimum extraction rate in litres/second</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen</td>
<td>6 (13 boost)</td>
</tr>
<tr>
<td>Utility room</td>
<td>4 (8 boost)</td>
</tr>
<tr>
<td>Bathroom</td>
<td>4 (8 boost)</td>
</tr>
<tr>
<td>Toilet</td>
<td>3 (6 boost)</td>
</tr>
</tbody>
</table>

**NON-DOMESTIC TECHNICAL HANDBOOK**

3.14.5 Mechanical ventilation

Mechanical extract should be provided in rooms where the cubic space per occupant is not more than $3 \text{ m}^3$, and in densely occupied rooms having low ceilings.

Mechanical ventilation should be designed and installed in accordance with:

- CIBSE Guide B: *Heating, Ventilating, Air conditioning and Refrigeration*, or

  for rooms intended to be occupied, a mechanical air supply should be provided at a rate of at least $8 \text{l/sec of fresh air (per occupant)}$ based on sedentary occupants and the absence of other requirements such as the removal of moisture.

For domestic-sized rooms where moisture is produced, such as kitchens, bathrooms and sanitary accommodation, rapid ventilation and trickle ventilation should be provided in accordance with Clause 3.14.3 of the domestic Technical Handbook.

**Note:** Mechanical ventilation can significantly increase the energy consumption of buildings.

Garages should be ventilated to protect building occupants from harmful vehicle emissions. Recommendations for ventilation in garages are summarised in the following table.

Summary of recommended ventilation provision in garages used for parking motor vehicles

<table>
<thead>
<tr>
<th>Space to be ventilated</th>
<th>Ventilation recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small garage (area less than 30 m²)</td>
<td>No specific ventilation requirements</td>
</tr>
</tbody>
</table>
| Small garage (area not less than 30 m² but not more than 60 m²) | Should be provided with either:  
Natural ventilation - provided by at least 2 permanent ventilators each having an open area of 1/3000th of the floor area they serve and (one being positioned at 600 mm or less above floor level) to encourage through ventilation, or  
Mechanical ventilation - capable of continuous operation providing at least 2 air changes per hour and independent of any other ventilation system. Two thirds of the exhaust air should be extracted from outlets positioned at 600 mm or less above floor level. |
Technical Standard: 3.0 Environment

<table>
<thead>
<tr>
<th>Space to be ventilated</th>
<th>Ventilation recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large garage</td>
<td></td>
</tr>
<tr>
<td>(area more than 60m²)</td>
<td></td>
</tr>
</tbody>
</table>

Ventilation provided in accordance with Section 2 of CIBSE Guide B: Heating, Ventilating, Air conditioning and Refrigeration, or by:

Openings in the walls on every storey of at least $1/20$th of the floor area of that storey with at least half of such area in opposite walls to promote extract ventilation, if the garage is naturally ventilated.

Providing a mechanical ventilation system capable of at least 6 air changes per hour and at least 10 air changes per hour where traffic concentrations occur.

A combined natural/mechanical ventilation system provided by:

- openings in the wall on every storey of at least $1/40$th of the floor area of the storey with at least half of such area in opposite walls, and
- a mechanical system capable of at least 3 air changes per hour.

Requirements of BS 7671

Wiring systems, including those relating to the installation of electrically actuated mechanical ventilation systems, should be selected and installed so that they provide adequate protection against the external influences likely to be present. Section 522 of BS 7671 contains requirements for providing protection against particular external influences such as, among others, water, temperature and mechanical stresses.

Additionally, where electrical installation work is carried out in a special location (or forms part of a special installation) the requirements of Section 522 should be modified by the particular requirements of the relevant section of Part 7 of BS 7671. Consequently, where work is undertaken in a room containing a bath or shower, in addition to the relevant requirements of Section 522, the particular requirements of Section 701 regarding ingress protection (IP) ratings, the siting of equipment and accessories in zones and other specific measures should be applied.

*Note:* A classification and codification of external influences is provided in Appendix 5 of BS 7671.
Requirements for control circuits, such as those installed to control heating and ventilation systems, are contained in Section 557 of BS 7671—Auxillary circuits.

3.15 Condensation (domestic and non-domestic)

3.15.0 Introduction

Condensation in buildings should be controlled, excess condensation not only causes damage to building fabrics, but the resulting mould growth (fostered by the damp conditions) can cause respiratory allergies. Therefore, appropriate methods of ventilation should be employed, as discussed previously in 3.14 of this guide, to control humidity.

Note: Where the relative humidity in a room is 70 % or above for sustained periods the growth of moulds is supported (Clause 3.15.2 of the Technical Handbooks refer).
3.15.4 Surface condensation – thermal bridging

Thermal bridging occurs when the continuity of the building fabric is broken by the penetration of an element allowing a significantly higher heat loss than its surroundings. As such, care should be taken to avoid the occurrence of thermal bridging where cabling or enclosures penetrate a floor, wall, roof or other building element.

Guidance is contained in BS 5250: 2011 *Code of Practice for control of condensation in buildings*.

3.17 Combustion appliances – safe operation (domestic and non-domestic)

3.17.0 Introduction

The operation of extract fans in buildings lowers the air pressure, which increases the risk of open-flue appliances leaking combustion products, even if the appliance and the fan are in different rooms. Therefore, electrical installers need to be aware of these risks and confirm that combustion appliances will operate safely when extract fans are running.

3.17.8.c Extract fans

For a gas-fired appliance, where a kitchen contains an open-flued appliance, the extract rate of the kitchen extract fan should not exceed 20 l/sec.

*BS 5440-1 provides guidance on the safe operation of such appliances.*
3.20 Combustion appliances – removal of products of combustion (domestic and non-domestic)

3.20.20 Carbon monoxide detection

Carbon monoxide (CO) is a colourless, odourless but highly toxic gas which can leak from defective or poorly maintained combustion appliances and poison humans and animals.

To alert occupants to the presence of harmful levels of CO, a detection system should be provided in all dwellings having:

- a new or replacement fixed combustion appliance installed in the dwelling, unless the appliance is used solely for cooking, or
- a new or replacement fixed combustion appliance installed in an interconnected space, such as an integral garage.

**Note:** Landlords are legally obligated, under the Housing (Scotland) Act 2006, to provide CO detectors in privately rented properties. For guidance, refer to the Scottish Government Statutory Guidance for the provision of carbon monoxide alarms in private rented housing, available from [www.gov.scot](http://www.gov.scot)
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Annex
4.5 Electrical safety (domestic and non-domestic)

Mandatory Standard 4.5 - Every building must be designed and constructed in such a way that the electrical installation does not:

a) threaten the health and safety of people in, and around, the building, and

b) become a source of fire.

4.5.0 Introduction

As a consequence of defective electrical installations, occupants may be exposed to injury from fire, electric shock, burns and similar, so the intention of this standard is to ensure that fixed electrical installations are installed safely and properly maintained.

The fixed electrical installation includes the electrical wiring, associated components and fittings, and all permanently secured equipment, but excludes portable equipment and appliances.

Note: Where a conversion is carried out it should meet the requirement of this standard.

4.5.1 Electrical installations

An electrical installation, whether designed to operate at either extra-low or low voltage should be designed, installed, inspected and tested in accordance with BS 7671, as amended (Clauses 4.5.1 and 4.5.2 of the Technical Handbooks refer).

The NICEIC Certification of Construction Scheme (electrical installations to BS 7671) is authorised by the Scottish Government to certify electrical installation work for compliance with the Scottish Building Regulations.

When electrical installation work is carried out by an NICEIC registered contractor, in addition to an NICEIC Electrical Installation Certificate, a Certificate of Construction is also issued to confirm compliance with the Scottish Building Regulations (refer to Section 1 of this guide).
BS 7671 - Fundamental principles

The fundamental principles of BS 7671, set out in the requirements contained in Chapter 13, are to protect persons, property and livestock from dangers that may arise when electrical installations are used (Regulation 131.1).

Such dangers can arise as a result of, for example:

- fault currents,
- arcing,
- excessive temperatures, or
- mechanical movement of electrically actuated equipment.

To ensure electrical installations are safe for use, they should be designed by skilled persons (Regulation 132.1) and installed by skilled[7] or instructed persons, using good workmanship and proper materials (Regulation 134.1.1). The Installed electrical equipment should comply with the appropriate British or Harmonised standard, or an appropriate international standard, and manufacturers’ instructions should be taken into account (Regulations 133.1.1 and 134.1.1 refer).

As required by Regulations 134.2 and 135.1, initial verification and periodic inspection and testing of electrical installations should be carried out in accordance with Part 6 of BS 7671.

[7] Skilled person and instructed person are defined in Part 2 of BS 7671, as amended.
Part 6 of *BS 7671 - Inspection, testing and certification*

Regulation 641.1 requires that every installation is inspected and tested before being put into service to verify the requirements of *BS 7671* have been met. The verification should be completed by skilled persons competent in such work (Regulation 641.6). In the case of an alteration or an addition to an existing installation, the work should comply with the requirements of *BS 7671* and not impair the safety of the existing installation (Regulation 641.5).

To confirm that electrical installation work complies with the current requirements of *BS 7671* a correctly compiled Electrical Installation Certificate including schedules of the inspection and test results should be provided to the person ordering the work (Regulation 641.1 and 641.3 refer). For an addition or alteration to an existing circuit a Minor Electrical Installation Works Certificate may be used.

Examples of NICEIC certificates are contained in Annex 6 and 7 of this guide, respectively.
The NICEIC online certification system

In addition to printed pads and computer print-outs of certificates and forms, NICEIC also provides an online certification service known as the 'Cloud'.

This service allows certificates and reports as well as the new combined Certificate of Construction and Electrical Installation Certificate to be issued on-site, in the office or at home using a PC, Tablet or Smartphone, and securely stores and archives records in the Cloud. For information about online certification refer to www.niceiconline.com

Periodic inspection and testing

Having been certified and put into service all electrical installations should be inspected and tested at appropriate intervals to verify they remain safe for continued use. Periodic inspection provides feedback on the condition of the electrical installation to those responsible for the safety of the installation, especially on the remedial work, if any, required.

Periodic inspection should be undertaken by skilled person(s) competent in such work, and on completion of the inspection an Electrical Installation Condition Report (EICR), including schedules of inspection and test results, should be issued to the person ordering the inspection (Regulations 651.5 and 653.6 refer).

The interval between periodic inspection and testing should be a matter of engineering judgement exercised by the skilled person responsible for the periodic inspection and test (Regulation 652.1 refers).

NICEIC recommends that a newly installed electrical installation in a domestic premises is inspected and tested at an interval not exceeding 10 years, or on change of occupancy (whichever is sooner), after which the interval should be determined by the Inspector, based on the condition of the installation, and must be recorded on the Report. For a domestic installation this period is unlikely to exceed five years.

However, for certain types of premises, such as houses of multiple occupancy (HMOs) and privately rented houses, there is a legal obligation for periodic inspection to be undertaken within a specified time period.
Private rental properties

The landlord of a privately rented property in Scotland is legally responsible for ensuring that the property meets the Repairing Standard of Section 13 of the Housing (Scotland) Act 2006, at the start and throughout the tenancy.

The Repairing Standard, is the statutory minimum standard for private rented housing in Scotland, and applies to the fixed electrical installation, including electrical fixtures and fittings, and any electrical appliances provided by the landlord. As a result of amendments[8] to the Housing (Scotland) Act 2006, from 1st December 2015, landlords of privately rented properties, such as houses and flats, will be required to:

- have an electrical safety inspection carried out at their rented property at least once every five years by a competent person(s) and retain the report for a minimum of six years, and
- provide a copy of the most recent electrical safety report to the tenant before the tenancy begins, and subsequently provide copies of any electrical safety reports carried out during the tenancy (Section 19(A) of the Act refers), and
- have regard for the statutory guidance on the electrical safety inspection issued by Scottish Ministers, under Sections 13(4A) and 19B(4) of the Housing (Scotland) Act 2006 - *Scottish Government Statutory Guidance on Electrical Installations and Appliances in Private Rented Property.*

[8] The amendments inserted into Section 13 and 19 of the 2006 Housing (Scotland) Act can be referenced under Section 23 of the Housing (Scotland) Act 2010.
In accordance with the Scottish Government statutory guidance, the electrical safety inspection on a private rented property is comprised of two separate elements: an Electrical Installation Condition Report (EICR) on the safety of the electrical installation, fixtures and fittings, and a portable appliance test (PAT) on appliances provided by the landlord.

Consequently, from 1st December 2015, when an EICR is completed for such a property it should have a PAT testing record attached (item 41 of the statutory guidance refers).

In accordance with Annex A of the statutory guidance for rented properties, the landlord must ensure that periodic inspection and testing is undertaken by persons competent in such work. Consequently, where the landlord intends to employ a contractor that is not registered with an accredited body, such as NICEIC, they should use the Checklist provided in Annex A to confirm evidence of competency.

**Note:** Smoke alarms should be included in the electrical safety inspection (Section 13(1f) of the Repairing Standard refers).

Annex 9 of this publication, provides further details on the statutory guidance and good practices recommended in the: *Scottish Government Statutory Guidance on Electrical Installations and Appliances in Private Rented Property*.

The statutory guidance can be downloaded from the following website: [www.gov.scot](http://www.gov.scot)

The NICEIC produces publications which provide practical advice and guidance on the inspection and testing of electrical installations, completion of electrical certificates and reports, and Portable Appliance Testing (PAT).

For information on periodic inspection and testing, PAT and a range of other training courses that NICEIC offers in Scotland refer to: [www.niceic.com/contractor/training/scotland-training](http://www.niceic.com/contractor/training/scotland-training)
Houses of multiple occupancy (HMOs)

A HMO is a property that is shared by three or more tenants who aren’t members of the same family, and includes houses, flats, bedsits and other types of residential accommodation such as hostels and student halls of residence. Accommodation within a building that is separate but has shared toilet, personal washing or cooking facilities is taken to form part of a single HMO.

In addition to the Repairing Standard, a HMO is required to satisfy other standards, such as the Tolerable standard, of the housing (Scotland) Act 2006.

To ensure HMOs are managed properly and meet all the required safety standards, the landlord must obtain a licence from the local authority. Previously, mandatory HMO licensing operated under the Civic Government (Scotland) Act 1982, but is now incorporated under Part 5 of the Housing (Scotland) Act 2006. One important change that has been introduced under Part 5 is that local authorities are required to take account of the statutory guidance issued by Scottish Ministers: Licensing of houses in multiple occupation: Statutory guidance for Scottish local authorities.

In accordance with Part 4 of the statutory guidance, local authorities should be satisfied that appropriate and up-to-date documentation is available for each HMO, which shows that the electrical system and any appliances provided by the owner have been inspected and tested by competent persons and declared safe for use (item 4.10.7 refers).

Licensing of houses in multiple occupation: Statutory guidance for Scottish local authorities, can be downloaded from: www.gov.scot/Topics/Built-Environment/Housing/privaterent/government/la guidance

Note: Every HMO must have adequate fire precautions, including provision for detection and giving warning in case of fire, and escape from the building (Section 2 of this guide refers).
4.5.3 Installations operating above low voltage

To avoid the risk of harm, any circuit which is designed to operate at a voltage higher than low voltage should be provided with a cut-off switch for use in emergency in accordance with the recommendations of BS 7671, as amended.

A firefighter’s switch, in a conspicuous position, should be provided in the low voltage side of any circuit supplying exterior electrical installations or internal discharge lighting installations (including luminous tube signage) operating at a voltage exceeding low voltage.

**Firefighter’s switch**

*Note: Low voltage is a voltage exceeding extra-low but not exceeding 1000 V AC or 1500 V DC measured between conductors or 600 V AC or 900 V DC measured between conductors and Earth.*
Requirements of BS 7671

Requirements for firefighter’s switches are contained in Section 537.4 of BS 7671. Regulations 537.4.2.1 states that it is preferred to have a single firefighter’s switch controlling every exterior installation operating at a voltage exceeding low voltage within a single premises and similarly, it is preferred to have a single firefighter’s switch controlling every internal discharge lighting installation operating at a voltage exceeding low voltage within a single premises. Furthermore, where both interior and exterior discharge lighting installations exist within a single premises they should be controlled separately.

**Note:** Regulation 537.4.2 does not include a portable discharge lighting luminaire or a sign having a rating not exceeding 100 W (fed from a socket-outlet).

Regulation 537.4.2.2 gives specific requirements for the siting of firefighter’s switches and associated advisory notices, which may be summarised as follows:

- For an exterior installation, the switch should be mounted outside the building and its function, either on account of its position or by the posting of appropriate notices at both the installation and switch, should be clear.

- For an interior installation, the switch should be in the main entrance to the building, unless an alternative position is agreed with the local fire authority.

The switch should be placed in a conspicuous position, reasonably accessible to firefighter’s, and mounted at a height not more than 2.75 m above the ground or other surface immediately below the switch, unless an alternative position is agreed with the local fire authority. Where more than one switch is installed on any one building, each switch should be clearly marked to aid identification of the installation, or part installation, it controls.

**Note:** Requirements regarding the actual switch are contained in Regulation 537.4.4.
4.6 Electrical fixtures (domestic only)

Mandatory Standard 4.6 - Every building must be designed and constructed in such a way that electric lighting points and socket outlets are provided to ensure the health, safety and convenience of occupants and visitors.

4.6.0 Introduction

The provision of lighting and power should be appropriate for the building and its occupants. In particular, providing an adequate number of socket-outlets in buildings not only reduces the risk of any individual socket-outlet being overloaded, but also reduces the need to use extension leads.

4.6.1 Lighting

A dwelling should have at least one electric lighting point in every circulation space, kitchen, bathroom, toilet and other space having a floor area of 2 m² or more. Whilst, lighting serving a stairway, should be provided with control switching arrangements at, or nearby, each storey.
4.6.2 Lighting in common areas of domestic buildings

Artificial lighting should be provided in common areas of buildings to minimise the risk of slips, trips and falls and prevent collisions with obstacles. A minimum uniform lighting level of 100 lux, at floor level, should be provided on stairways and landings, and at least 50 lux should be provided in other circulation areas.

Note: Such lighting should operate automatically during the hours of darkness.

So that light switches in common access corridors or stairways or other communal areas are accessible, and operable by disabled people, switches should be positioned between 900 mm and 1200 mm above floor level (Clause 4.8.5 refers).

4.6.3 Door entry systems

A door entry system should be installed at the principal means of access to a communal building, positioned between 0.9 m and 1.2 m above floor level. The system should include a remote door release, intercom at the point of entry and a call unit within each dwelling served by that entrance.
A door entry unit positioned at a common entrance should include an inductive coupler compatible with the ‘T’ setting on a personal hearing aid, and a visual indicator to show that a call has been received.

4.6.4 Socket-outlets

To minimise the fire, shock and trip hazards associated with the use of multi-way adaptors and extension leads, the following number of 13 A socket-outlets should be provided, as a minimum, in a dwelling:

- four socket-outlets within each apartment (room), and
- six socket-outlets within the kitchen, at least three of which should be situated above the worktop level in addition to any socket-outlets provided for floor-standing white goods or built-in appliances, and
- an additional four socket-outlets anywhere in the dwelling, including at least one within each circulation area of each level or storey.

*Note: Single or twin socket-outlets may be installed to give the recommended number of outlets in each space.*

Requirements of BS 7671

Section 559 covers luminaires and lighting installations intended to be part the fixed installation. Among the requirements regarding connection to the fixed wiring, Regulation 559.5.1.207 requires that such lighting installations should be appropriately controlled. An explanation of symbols that are used in luminaires, controlgear and for the installation of luminaires is provided in Table 55.3.

Outdoor lighting* and extra-low voltage lighting installations are classified as special installations in BS 7671, so requirements for these installations are contained in Section 714 and Section 715, respectively.

*Except temporary festoon lighting, or luminaires fixed to the outside of the building and supplied from the fixed internal installation.*
Examples of symbols contained in Table 55.3

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luminaire with limited surface temperature <em>(BS EN 60598 series)</em></td>
<td></td>
</tr>
<tr>
<td>Recessed luminaire not suitable for direct mounting on normally flammable surfaces</td>
<td></td>
</tr>
<tr>
<td>Surface mounted luminaire not suitable for direct mounting on normally flammable surfaces</td>
<td></td>
</tr>
<tr>
<td>Rated maximum ambient temperature <em>(BS EN 60598 series)</em></td>
<td></td>
</tr>
<tr>
<td>Minimum distance from lighted objects (m) <em>(BS EN 60598 series)</em></td>
<td></td>
</tr>
<tr>
<td>Luminaire for use with high pressure sodium lamps that require an external ignitor <em>(BS EN 60598 series)</em></td>
<td></td>
</tr>
<tr>
<td>Short-circuit proof (both inherently and non-inherently) safety isolating transformer <em>(BS EN 60598 series)</em></td>
<td></td>
</tr>
<tr>
<td>Electronic convertor for an extra-low voltage lighting installation</td>
<td></td>
</tr>
</tbody>
</table>

Section 553 contains requirements for accessories including plugs and socket-outlets. Table 55.1 contains the type, rating and standard for various types of plugs and socket-outlets used for low voltage circuits.
4.7 Aids to communication (non-domestic)

**Mandatory Standard 4.7** - Every building must be designed and constructed in such a way that it is provided with aids to assist those with a hearing impairment.

### 4.7.0 Introduction

The intention of this standard is to assist people with a hearing impediment in communication where this is made more difficult by physical conditions or layout within a building.

### 4.7.1 Hearing enhancement systems

People with hearing impairment should be able to access facilities and participate fully in activities such as conferences, meetings and entertainments.

Hearing enhancement systems such as induction loop, infrared or radio transmission should be provided in the following locations:

- any auditorium or other space, with fixed seating, where an audience or spectators will be present, and
- any room with a floor area more than 60 m² that is intended to include uses such as meetings, lectures, classes or presentations, and
- any location where a person is separated from a vendor or service provider by a physical barrier such as a glazed screen, and
- the principal reception desk, public counter or information point in any building to which the public have access. In larger buildings, with multiple entrances, there may be a number of these in different locations.

The installation of such a system should enhance sound communicated to the user, whether received directly through a personal hearing aid, or through additional equipment supplied as part of the system. It should preserve the characteristics of the source whilst suppressing reverberation and extraneous noise and should not be affected by environmental interference such as from lighting or other electrical installations.
General advice on provision and installation of listening equipment and selection of systems is available from the Royal National Institute for Deaf People website: www.actiononhearingloss.org.uk

4.8 Danger from accidents (domestic and non-domestic)

Mandatory Standard 4.8 - Every building must be designed and constructed in such a way that:

a. people in and around the building are protected from injury that could result from fixed glazing, projections or moving elements on the building

b. fixed glazing in the building is not vulnerable to breakage where there is the possibility of impact by people in and around the building

c. both faces of a window and rooflight in a building are capable of being cleaned such that there will not be a threat to the cleaner from a fall resulting in severe injury

d. a safe and secure means of access is provided to a roof (applies to non-domestic buildings only) and

e. manual controls for ventilation and for electrical fixtures can be operated safely.

4.8.5 Access to manual controls

To ensure safe and convenient use electrical socket-outlets, switches, and other outlets and controls (including fire alarm call points and timer controls or programmers) should be located at least 350 mm from any internal corner, projecting wall or similar obstruction, and positioned at the following heights:

- light switches should be positioned at a height of between 900 mm and 1100 mm above floor level, and
- standard switched or unswitched socket-outlets and outlets for other services such as telephone or television should be positioned at least 400 mm above floor level.

Fixtures should be at least 150 mm above the projecting surface of an obstruction, such as a worktop. Where socket-outlets are concealed, such as to the rear of white goods in a kitchen, separate switching should be provided in an accessible position to allow appliances to be isolated before general maintenance or cleaning is undertaken.
Mounting heights

**Note:** Electrical accessories and controls should not be sited at more than 1.2 m above floor level (unless the need for a higher location can be demonstrated).
This section of the Technical Handbooks is specifically aimed at providing protection against the transmission of sound between attached buildings, or the walls and floors of differently occupied areas of the same building and certain rooms in dwellings.

Those undertaking electrical work, particularly the installation of recessed downlighters, should ensure such work is carried out in a manner that does not adversely affect the sound insulation properties of building structures.

**Note:** Where electrical equipment, such as downlighters, are recessed into ceilings it can reduce the fire integrity of the building structure. Therefore, reference should also be made to the guidance given in Section 2.2 (Fire) of this publication, regarding the penetration of separating and compartment floors/walls.

### 5.1 Noise separation (domestic and non-domestic)

**Mandatory Standard 5.1** - Every building, which is divided into more than one area of different occupation, must be designed and constructed in such a way to limit the transmission of source noise from normal domestic type activities, between such areas, to a level that will not threaten the health of, or cause inconvenience to the building occupants.

**Note:** This standard only applies to a building in different occupation incorporating; attached dwellings or attached residential buildings, or a roof, walkway or access deck located directly above an area that is either a dwelling or a residential building.

### 5.1.3 Example constructions

Example constructions have been developed to support the Technical Handbooks and are available on the BSD website: [www.gov.scot](http://www.gov.scot)
Section 3, (Clause 3.e) of the BSD guidance document: *Example Constructions and Generic Internal Constructions*, recommends that downlighters should:

- be at centres of not less than 0.75 m,
- have openings no greater than 100 mm diameter or 100 mm x 100 mm, and
- be installed at no more than one downlighter per 2 m² of total ceiling area in each room.

**Downlighters (recessed lighting)**

Downlighters installed at a greater density than one per 2 m² should be supported by test evidence undertaken in accordance with Annex B6 of *Example Constructions and Generic Internal Constructions*.

**Note:** For guidance on the installation of downlighters, and flush mounted accessories, within domestic premises, refer to the Electrical Safety First Best Practice Guide No 5: Electrical installations and their impact on the fire performance of buildings: Part 1 - Domestic premises, which can be downloaded from www.electricalsafetyfirst.org.uk
5.1.7 Noise from services

Services, in particular air conditioning units and ventilation systems, have the potential to transmit noise. Therefore, no service pipes or ducts should pass through a separating wall between a dwelling and a common stairway, common passage or service enclosure unless the pipes and ducts are protected as recommended in Section 2 (Fire) of the Technical Handbooks.

In any separating floor being built to one of the specified constructions, no openings should be formed, apart from openings for service ducts, pipes, or chimneys which are protected as recommended by Section 2 Fire and Section 3 Environment, and are enclosed above and below the floor as described in the notes on floor penetrations for each of the recommended floor constructions.

Requirements of BS 7671

Materials used to prevent or minimise sound transmission will, in many cases also be good insulators. Regulation 523.9 states that where a cable is to be installed in a space where thermal insulation is likely to be placed, the cable should where possible be fixed in a position such that it will not be covered by the insulation. Where this is not possible, it may be necessary to increase the cross-sectional area of the cable as appropriate.

Where a thermoplastic insulated and sheathed flat cable with protective conductor (twin and earth cable) is installed in a thermally insulated wall or above a thermally insulated ceiling with the cable being directly in contact with a thermally conductive surface on one side, the cable should be taken as being installed to Reference Methods 100 to 103. The appropriate columns within the table 4D5 given in Appendix 4 of BS 7671 should be employed with reference to current-carrying capacity.
Cables installed in a thermally insulated wall

Where a cable is totally surrounded by thermal insulation for less than 0.5 m the current carrying capacity of the cable shall be reduced depending on the cross-sectional area of the cable (csa), length surrounded by the insulation and the thermal properties of the installation. Table 52.2 of BS 7671 contains rating factors that may be applied to cables having conductors of csa up to 10 mm².

Where a cable is likely to be totally surrounded by thermally insulating material for more than 0.5 m, its current-carrying capacity should be taken, in the absence of more precise information as 0.5 times the current-carrying capacity of that cable if installed clipped direct (Reference Method C).

**Cable surrounded by thermal insulation**

(a) A cable in a thermally insulating wall or above a thermally insulating ceiling, and in contact with a thermally conductive surface on one side

(b) A cable totally surrounded by thermally insulating material

Key:
- A cable (or conduit containing cable(s))
- Thermally insulating material
6. Energy
6.0.1 Background

The Climate Change (Scotland) Act 2009 introduced a statutory framework for reducing greenhouse gas emissions in Scotland, with an interim target of a 42% reduction in carbon dioxide (CO₂) emissions compared to 1990 by 2020, and an 80% reduction target for 2050.

Reducing the energy used in buildings is a key target, so the aim of the standards contained in Section 6 of the Technical Handbooks is to deliver buildings that are more energy efficient and reduce carbon emissions. Especially, emissions produced from the use of building services such as heating, lighting, ventilation and air conditioning systems.

Achieving these targets requires greater emphasis to be placed on the factors that can effect the performance of building services, such as the type of design, specification choices, installation and commissioning of the installed work.

In support of this, BSD publishes a Domestic and Non-domestic, Building Services Compliance Guide for Scotland (BSCG), which contain detailed guidance on achieving compliance with the minimum energy efficiency performance standards for fixed building services recommended by Standards 6.3 to 6.6 of the Technical Handbooks.

The documents cover the design, installation and commissioning of building services both conventional and low carbon systems for the purpose of heating, ventilation and lighting and should be referenced as indicated in the following section.

It should be appreciated that higher levels than the minimum standards recommended in the BSCGs are required to achieve compliance with Mandatory Standard 6.1. Likewise higher levels are also required for products to be recognised as renewable technologies, or for compliance with Microgeneration Certification Scheme (MCS) standards.

Note: The BSCGs replicate guidance published in support of building standards elsewhere in the UK and support standardisation of the specification and expected performance of fixed building services throughout the UK. The documents can be accessed from: www.gov.scot
6.1 Carbon dioxide emissions (domestic and non-domestic)

**Mandatory Standard 6.1** - *Every building must be designed and constructed in such a way that:*

a. *the energy performance is estimated in accordance with a methodology of calculation approved under regulation 7(a) of the Energy Performance of Buildings (Scotland) Regulations 2008 and*

b. *the energy performance of the building is capable of reducing carbon dioxide emissions.*

**This standard does not apply to:**

a) alterations and extensions to buildings, other than:
   - alterations and extensions to stand-alone buildings having an area less than 50 m² that would increase the area to 50 m² or more,
   - extensions to non-domestic buildings where the extension will have an area which is both greater than 100 m² and greater than 25 % of the area of the existing building, and
   - alterations to buildings involving the fit-out of the building shell which is the subject of a continuing requirement.

b) conversions of buildings

c) non-domestic buildings and buildings that are ancillary to a dwelling that are stand-alone having an area less than 50 m²

d) buildings, which will not be heated or cooled, other than by heating provided solely for the purpose of frost protection, or

e) limited life buildings which have an intended life of less than 2 years.
6.1.0 Introduction (domestic and non-domestic Technical Handbooks)

The aim of this standard is to reduce CO₂ emissions produced by the use of heating, lighting, and ventilation in new dwellings and large extensions. In view of this, designers should consider energy performance as a complete package rather than looking only at individual elements such as insulation or boiler efficiency, and give consideration to integrating low carbon equipment (LCE), such as photovoltaic, solar water heating or combined heat and power and heat pumps, within their designs.

Photovoltaic system

It should be noted that there are a number of EU Directives that directly or indirectly control the energy efficiency of building services, such as:


This EU legislation is intended to promote the improvement of energy performance of buildings, by requiring EU countries to set minimum energy performance requirements for new buildings and renovations. Key aspects include the use of Energy Performance Certificates (EPCs) and inspection schemes for heating and air conditioning systems.
Building services, such as air conditioning systems, should be commissioned in accordance with Clauses 6.7 and 6.8 of the Technical Handbooks.

Note: Regulation 17 of the Building (Scotland) Act 2003 states the continuing requirements for air conditioning systems (refer to Clause 0.17 of the Handbooks).

The Renewable Energy Directive 2009/28/EC

This Directive sets mandatory targets to promote the use of energy from renewable resources. The target for the UK is to achieve 15% of energy generation from renewable resources by 2020.

The Ecodesign Directive 2009/125/EC

Energy using products must satisfy the energy efficient requirements of this Directive before they can obtain a CE Mark and be placed on the market. This Directive is complemented by the Labelling Directive, which labels the energy efficiency of electrical products using an energy scale of A-G (Refer to Chapter 7 - Sustainability).

Note: The CE mark is one method of establishing the suitability of a product and is assigned in accordance with the Construction Product Regulation (CPR) refer to Clause 0.85 of the Technical Handbooks.

Requirements of BS 7671

Requirements for the connection of a low voltage generating set to operate in parallel with the distributor’s public electricity supply are contained under Regulation Group 551.7. However, a solar photovoltaic (PV) supply system is classed as a special installation (installation of increased risk) and so the general requirements will need to be modified or supplemented by the particular requirements contained in Section 712 of BS 7671 – Solar Photovoltaic (PV) Power Supply Systems.
The NICEIC solar PV learning guide provides guidance on the installation of solar photovoltaic microgeneration systems (those having an output not exceeding 16 A).

The NICEIC Microgeneration Certification Scheme (MCS) is approved to register installers in the following areas:

- Solar Thermal Hot Water
- Heat Pumps
- Solar PV
- Biomass
- Micro and Small Wind Turbines

The NICEIC MCS Scheme covers design installation and testing of environmental technology installation work associated within dwellings.

*Note:* MCS standards exceed the recommended minimum standards contained in the BSCGs.
6.1.1 Dwellings (domestic)

Standard 6.1 is aimed at reducing the carbon emissions produced in new dwellings. The energy rating of new dwellings can be calculated using the Government’s standard energy assessment software package SAP, and the calculated carbon emission rate for the proposed dwelling (DER) should not exceed the target emissions rate (TER) of the ‘notional dwelling’ (Clause 6.1.1 to 6.1.5 of the domestic Technical Handbook refers).

Alternatively, ‘A simplified approach’ as detailed in Clause 6.1.6 may be used to achieve the required building energy performance.

**Note:** An Energy Performance Certificate (EPC) is required, on completion of the dwelling, to meet Standard 6.9. of the Technical Handbook.

Where a new dwelling has accommodation with a total floor area not exceeding 50 m$^2$ that is intended for use by the occupants in a business or professional capacity, such as an office, surgery or consulting room, the accommodation should be considered to be part of the dwelling. For conservatories and other ancillary stand-alone buildings of 50 m$^2$ or more, the guidance and methodology for calculating energy performance contained in the non-domestic Technical Handbook should be followed.

6.2.4 Limiting uncontrolled air infiltration (and 6.2.6 of the non-domestic Technical Handbook)

Buildings should be designed to deliver the intended thermal performance without comprising air quality. Therefore, lowering of air infiltration rates to improve energy performance should not compromise the ventilation required, as detailed in Section 3 of the Technical Handbooks, for:

- the health of the occupants
- the removal of moisture
- the safe operation of combustion appliances, and
- any smoke control system (designed in accordance with Section 2 of the Technical Handbooks).
Infiltration rates of less than $5\text{m}^3/\text{h/m}^2 @ 50 \text{ Pa}$ in dwellings may give rise to problems with internal air quality and condensation so additional measures such as a mechanical ventilation system may be required (refer to Clauses 13.14.2 and 3.14.11 of this guide).

**Note:** To determine whether the air infiltration rates in completed dwellings correspond to the design levels, air-tightness testing should be carried out, in accordance with BS EN ISO 9972 (Clause 6.2.5 of the domestic and Clause 6.2.7 of the non-domestic Technical Handbooks refer).

### 6.1.1 Simplified Building Energy Model SBEM (non-domestic)

SBEM is an approved software calculation tool that can be used to calculate CO$_2$ emissions for new buildings and large extensions. It is available on the National Calculation Methodology website [www.ncm.bre.co.uk/index.jsp](http://www.ncm.bre.co.uk/index.jsp)

Similar to the domestic model, to achieve compliance with Standard 6.1 the calculated building emission rate (BER) should not exceed the target emissions rate (TER) for the ‘notional building’. Where the BER exceeds the target rate the designer can review the building services and make improvements to increase operating efficiency, such as incorporating some ‘enhanced management and control’ such as power factor correction equipment.

Alternative calculation tools may be used, particularly where the building design is considered to be complex. A list of approved software calculation tools can be accessed at: [www.gov.scot](http://www.gov.scot)

**Note:** Information regarding the particular software package used needs to be submitted as part of the building warrant application.
6.3 Heating system (domestic and non-domestic)

Mandatory Standard 6.3 - Every building must be designed and constructed in such a way that the heating and hot water service systems installed are energy efficient and are capable of being controlled to achieve optimum energy efficiency.

This standard does not apply to:

- buildings which do not use fuel or power for controlling the temperature of the internal environment, or
- heating provided solely for the purpose of frost protection.

Minimum performance standards for fixed heating systems in new and existing buildings are contained in the domestic and non-domestic versions of the BSCG, respectively.

Note: For new buildings to achieve compliance with Standard 6.1, the minimum (backstop) levels given in the BSCGs for appliance efficiencies and controls will normally be exceeded.

DOMESTIC TECHNICAL HANDBOOK

6.3.0 Introduction

The following guidance applies to primary heating systems in dwellings and should be considered along with the guidance contained in Section 3 - Environment, regarding the heating of dwellings. While use of renewable sources, such as solar thermal or biomass systems, are recommended for providing energy for heating purposes, whichever system type is installed it should have the necessary controls to ensure it operates in an energy efficient manner.

6.3.1 Performance of fixed heating systems in new and existing dwellings

Section 4 (Electric heating) of the Domestic BSCG provides guidance on fixed electric heating systems in dwellings for both new and existing buildings.
Recommended minimum standards for electric boilers serving wet central heating systems to meet the relevant energy efficiency requirements of the Scottish Building Regulations are contained in Tables 16, 17, 18 and 19 of Section 4.

Minimum standards recommended for the control of primary and secondary electric heating systems, other than those served by electric boilers, are shown opposite (Table 20 of Section 4 refers).

*Note:* For guidance on the specification and control of electric heat pumps, refer to Section 9 of the Domestic BSCG.

**Solar water heating:** inherently energy efficient, having low or zero carbon dioxide emissions and minimal running costs. Guidance on the specification of indirect solar water heating for dwellings is provided in Section 11 of the *Domestic BSCG*.

**Electric floor heating:** guidance on the specification of floor heating systems in new dwellings is provided in Section 7 of the *Domestic BSCG*, which recommends that electric floor heating systems are designed and installed in accordance with Section 753 of *BS 7671*, as amended (Table 31(1c) refers).

Table 33 in Section 7 provides recommended minimum standards for construction and control of electric floor heating systems. For under-tile electric floor heating systems programmable room thermostats with a manual override feature are recommended, as a minimum, to allow space temperature to be controlled and floor void temperature to be limited in each area for safety and comfort.
Minimum standards recommended for the control of primary and secondary electric heating systems, other than those served by electric boilers

<table>
<thead>
<tr>
<th>Type of electric heating system</th>
<th>Control type</th>
<th>Minimum standard</th>
</tr>
</thead>
</table>
| Warm air systems                | Time and temperature control, either integral to the heater or external Zone control | Provided by: a) a time switch/programmer and room thermostat, or b) a programmable room thermostat.  
Dwellings with a total floor not exceeding 150 m² should have at least two space heating zones with independent temperature control, one of which is assigned to the living area.  
Dwellings with a total floor exceeding 150 m² should have at least two space heating zones with independent temperature and time control. Time control may be provided using: a) multiple heating zone programmers, or b) a single multi-channel programmer, or c) programmable room thermostats, or d) separate timers to each circuit, or e) a combination of (c) and (d).  
In single-storey, open-plan dwellings in which the living area is greater than 70 % of the total floor area, sub-zoning of temperature control is not appropriate. |
| Panel heaters                   | Local time and temperature control  | a) Time control provided by a programmable time switch integrated into the appliance or a separate time switch.  
b) Individual temperature control provided by: integral thermostats, or separate room thermostats or programmable room thermostats.  
Note: Panel heater systems provide instantaneous heat. |
NON-DOMESTIC TECHNICAL HANDBOOK

6.3.0 Introduction

Accurate control of heating systems is essential for energy efficiency. Heating systems should have sufficient zone, time and temperature controls to ensure they operate efficiently and only provide the desired temperature when the building is occupied. However, heating systems should also be designed to allow operating controls to be overridden when heating is needed to protect the building’s structure, services or contents from frost or condensation damage.

6.3.1 Performance of fixed heating systems in new and existing buildings

Recommended minimum performance standards for space heating and hot water systems, heating appliances and controls for new and existing buildings are contained in the Non-domestic BSCG.

Section 7 - Direct electric space heating, of the compliance guide provides guidance on specifying a range of fixed electric heating systems that may be used to provide primary or secondary space heating in new and existing buildings.

Control of electric space heating systems served by electric boilers, should achieve the minimum standards recommended by Table 23 of Section 7, whilst for other types of electric heating systems the following minimum standards are recommended.
Recommended minimum standards for control of primary and secondary electric heating systems other than electric boilers

<table>
<thead>
<tr>
<th>Type of electric heating system</th>
<th>Type of Control</th>
<th>Minimum standard</th>
</tr>
</thead>
</table>
| Warm air                       | Time and temperature control, either integral to the heater or external | a) a time switch/programmer and room thermostat, or  
b) a programmable room thermostat.  
For buildings with a total usable floor area greater than 150 m² - more than one space heating circuit should be provided, each having separate timing and temperature controls using either:  
a) multiple heating zone programmers, or  
b) a single multi-channel programmer. |
| Radiant heaters                | Zone or occupancy control | Connection to a passive infrared detector.  
Note: Electric radiant heaters (including quartz or ceramic types) can provide zone heating or be used for a full heating scheme. |
| Panel/skirting heaters         | Local time and temperature control | a) Time control provided by a programmable time switch integrated into the appliance or a separate time switch.  
b) Individual temperature control provided by:  
• integral thermostats, or  
• separate room thermostats  
Note: panel heater systems provide instantaneous heat. |
| Storage heaters                | Charge control | Automatic control of input charge (based on the ability to detect the internal temperature and adjust the charging of the heater accordingly).  
Manual controls for adjusting the rate of heat release from the appliance such as adjustable damper or some other thermostatically-controlled means. |

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### Type of electric heating system

<table>
<thead>
<tr>
<th>Type of Control</th>
<th>Minimum standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local fan control</td>
<td>a) A switch integrated into the appliance, or b) a separate remote switch.</td>
</tr>
<tr>
<td>Individual temperature control</td>
<td>a) Integral switches, or b) separate remote switching.</td>
</tr>
</tbody>
</table>

Note: For guidance on the specification and control of electric heat pumps, refer to Section 3 of the Non-domestic BSCG.

#### 6.3.2 Consequential improvement

Where work subject to a building warrant includes a new fixed service or an alteration or extension to an existing system it provides an opportunity to review and improve the performance of fixed building systems. Guidance on the extent to which improvement should be made is given in Annex 6.D of the non-domestic Technical Handbook – Improvement to the energy performance of existing building services when carrying out building work.

Note: Improving heating systems in older buildings can be more practical than other types of energy efficiency measures (such as improving wall insulation) and can help to offset lower energy efficiencies in other areas.

### Requirements of BS 7671

Section 554 – Current-using equipment contains requirements for the following types of heaters:

- Electrode water heaters and boilers (Regulation Group 554.1)
- Heaters for liquids or other substances having immersed heating elements (Regulation 554.2.1)
- Water heaters having immersed and uninsulated heating elements (Regulation Group 554.3).

Requirements for circuits installed to control heating systems or wiring integral to a Building Management System (BMS) are contained in Section 557 - Auxiliary circuits.
6.5 Artificial and display lighting (domestic and non-domestic)

Mandatory Standard 6.5 - Every building must be designed and constructed in such a way that the artificial or display lighting installed is energy efficient and is capable of being controlled to achieve optimum energy efficiency.

This standard does not apply to process and emergency lighting components in a building, or alterations in dwellings or a building ancillary to a dwelling.

Note: Process lighting is that intended to illuminate specialist tasks within a space, rather than the space itself. Examples of specialist process lighting include theatre spotlights, lighting used for the recording process in television studios and lighting in hospital operating theatres.

Conversions - in the case of conversions, as specified in Regulation 4 of the Building (Scotland) Regulations 2004, the building shall meet the requirements of this standard in so far as is reasonably practicable, and in no case be worse than before the conversion (Regulation 12, Schedule 6 refers).

6.5.0 Introduction (domestic and non-domestic Technical Handbooks)

For the purposes of reducing CO₂ emissions and operating costs, lighting designs should incorporate a combination of natural lighting and low energy artificial lighting, such as LED lighting. Furthermore, consideration should be given to providing lighting systems that will cause minimal disruption to the building fabric and services should any future upgrading be required.

LED lighting – GU10 lamp

Note: Lighting schemes consisting solely of GLS tungsten filament lamps or tungsten halogen lamps will not satisfy this standard.
DOMESTIC TECHNICAL HANDBOOK

6.5.1 Fixed lighting

To meet the energy efficiency requirements of Standard 6.5, fixed internal and external lighting for new and existing dwellings should meet the recommended minimum standards contained in Table 42 of Section 12 of the Domestic BSCG.

Fixed internal lighting

As recommended by Table 42 at least 75% of fixed internal lighting installed in new and existing dwellings, excluding lighting in cupboards and wardrobes, should be low energy fittings, such as compact fluorescent fittings (CFLs) or light emitting diodes (LEDs) with a lamp luminous efficacy exceeding 45 lumens/circuit-watt, and a total light fitting output greater than 400 lamp lumens.

Note 1: Halogen lamps will be banned from September 2021 with fluorescent lamps to follow, cutting both emissions and saving consumers on their energy bills.

Note 2: Light fittings whose supplied power is less than 5 circuit-watts may be excluded.

Circuit-watt: is the power consumed in lighting circuits by lamps and, where applicable, their associated control gear (including transformers and drivers) and power factor correction equipment.

The installed light fittings may be either:

- dedicated fittings which have separate control gear and take only low energy lamps (for example, pin based lamps), or
- standard fittings supplied with low energy lamps with integrated control gear (for example, bayonet or Edison screw base lamps).

Note: The total recommended load for connection to a single switch should not exceed 100 circuit-watts (generally not more than six light fittings).
Fixed external lighting

Fixed external lighting, is lighting that is fixed to an external surface of the dwelling and supplied from the occupier’s electrical system, except lighting in common areas of blocks of flats and in other communal routes.
Fixed external lighting should be selected and installed so that its use of energy is efficient. Where such lighting is required it is recommended that light fittings having the following characteristics are installed:

- fittings rated at not more than 100 lamp-watts per light fitting, and having automatic control by both movement detection (for example a PIR) and photocell to ensure operation only when needed, such as when the area is occupied or during the hours of darkness, or
- fittings with an efficacy of at least 45 lumens per circuit-watt, which are automatically controlled so they operate only during the hours of darkness.

Additionally, manual switching is recommended to allow the operation of automatic controls to be overridden when necessary.

Further guidance is contained in, The Energy Saving Trust publication GIL 20: Low energy domestic lighting – www.energysavingtrust.org.uk

NON-DOMESTIC TECHNICAL HANDBOOK

6.5.1 lighting efficiency and controls

Guidance for fixed internal and external lighting in non-domestic buildings is given in Section 12 of the Non-domestic BSCG.

The guidance contained in Section 12 covers interior and display lighting, and recommends that lighting and controls in new and existing buildings should either meet the minimum lighting efficacies of Table 42 of the Non-domestic BSCG, or satisfy the Lighting Energy Numerical Indicator (LENI) calculation method described in Section 12.5.

As recommended by Table 42, artificial lighting should be designed to satisfy the following minimum standards of efficacy (averaged over the whole area of the applicable type of space in the building):

- General lighting in office, industrial and storage spaces should have an initial value of not less than 60 luminaire lumens per circuit-watt, which should be reduced, as shown in Table 42, according to the controls employed.
Technical Standard: 6.0 Energy

- General lighting in other types of space should have an average initial efficacy of not less than 60 lamp lumens per circuit-watt.

- Display lighting should have an average initial efficacy of not less than 22 lamp lumens per circuit-watt.

*Luminaire lumens per circuit-watt* - is the (lamp lumens x light output ratio (LOR)) summed for all the luminaires.

*Lamps lumens per circuit-watt* - is the total lamp lumens summed for all luminaires in the relevant areas of the building, divided by the total circuit-watts for all the luminaires.

*Note:* Lighting should be metered to record energy consumption (Table 43 refers).

For guidance on the control of fixed light fittings and lamps provided for corridors, stairs and other circulation areas refer to Standard 4.6 of this publication.

**Typical display lighting rig**
6.5.2 Consequential improvement

Where work subject to a building warrant includes a new system or an alteration or extension to an existing system it provides an opportunity to review and improve the overall system. Guidance on the extent to which improvement should be made is given in Annex 6.D of the non-domestic Technical Handbook – *Improvement to the energy performance of existing building services when carrying out building work*.

Requirements of *BS 7671*

Section 559 contains requirements for the selection and erection of luminaires and lighting installations and includes, among others, the following:

- Regulation 559.5.1.207 requires lighting installations to be appropriately controlled.
- Regulation 559.5.2 contains requirements to provide an adequate means of fixing luminaires.
- Regulation 559.8 contains requirements for protection against electric shock for circuits supplying display stands.
- Table 55.3 provides an explanation of symbols to *BS EN 60598 series* regarding the luminaire and associated controlgear and the installation of the luminaire.

*Note:* Particular requirements for outdoor lighting and extra-low voltage lighting are contained in Part 7 of *BS 7671 – Special installations or locations, in Sections 714 and 715 respectively.*
6.6 Mechanical ventilation and air conditioning (MVAC) (domestic and non-domestic)

**Mandatory Standard 6.6** – Every building must be designed and constructed in such a way that:

a. the form and fabric of the building minimises the use of mechanical ventilating or cooling systems for cooling purposes, and

b. the ventilating and cooling systems installed are energy efficient and are capable of being controlled to achieve optimum energy efficiency.

**Note:** This standard does not apply to buildings which do not use fuel or power for ventilating or cooling the internal environment.

**DOMESTIC TECHNICAL HANDBOOK**

6.6.0 Introduction

Installing air conditioning or mechanical ventilation systems in dwellings, or buildings consisting of dwellings, for cooling purposes is not desirable as it leads to increased energy use and higher carbon dioxide emissions. However where such systems are installed, they should be energy efficient.

6.6.1 Form and fabric of the building

Dwellings should incorporate measures, such as natural ventilation, to restrict high internal temperatures from developing and necessitating the operation of mechanical ventilation or air conditioning systems to provide cooling.

Further information is available in the Energy Saving Trust publication CE129 - *Reducing Overheating - A Designer’s Guide*, refer to: [www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk)
6.6.2 Efficiency of mechanical ventilation and air conditioning systems in new and existing buildings

Where mechanical ventilation and air conditioning systems are required they should be designed and installed so as to operate efficiently. Guidance on achieving compliance with the energy efficiency requirements of functional Standard 6.6 is contained in the Domestic BSCG.

Mechanical ventilation

Section 8.2 of the Domestic BSCG recommends that mechanical ventilation systems are:

- installed in accordance with the Building Standards Supporting Guidance Domestic Ventilation 2nd edition, published by BSD, and
- comply with European Commission Regulation No 327/2011 implementing Directive 2009/125/EC with regard to ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500 kW, and
- meet the minimum standards for Specific Fan Power (SFP), heat recovery efficiency and controls in Table 34 of Section 8.2.

SFP should not exceed the following values:

**Maximum Specific Fan Power (SFP)**

<table>
<thead>
<tr>
<th>Extract system type</th>
<th>SFP (W/litres/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intermittent extract ventilation, and continuous supply ventilation</td>
<td>0.5</td>
</tr>
<tr>
<td>Continuous extract ventilation</td>
<td>0.7</td>
</tr>
<tr>
<td>Continuous supply and extract with heat recovery ventilation[^1]</td>
<td>1.5</td>
</tr>
</tbody>
</table>

[^1] The heat recovery efficiency of balanced mechanical ventilation systems incorporating heat recovery (MVHR) should not be less than 70 %.

The design and installation of ductwork can have a significant effect on the efficiency of a ventilation system (Clause 6.6.3 of the domestic Technical Handbook refers), so the relevant guidance contained in Section 9 of the DVG 2015, general recommendations for ductwork, should be followed.
Installation of flexible ductwork

**Note:** The Domestic Ventilation 2015 guide can be downloaded from: www.gov.scot

**NON-DOMESTIC TECHNICAL HANDBOOK**

### 6.6.0 Introduction

In order to optimise the efficiency of the mechanical ventilation and air conditioning (MVAC) equipment, attention should be given to the:

- form and fabric of the building, and
- energy efficiency of the installed equipment, and
- control of the equipment.
6.6.2 MVAC equipment efficiency, distribution systems and controls in new and existing buildings

Guidance on the efficiency of mechanical ventilation and air conditioning systems is given in the *Non-domestic BSCG*.

Appropriate means should be provided to manage, control and monitor the operation of equipment and systems. Control of MVAC should be in accordance with the advice and guidance given in *BS EN 15232: Energy performance of buildings* (refer to Table 37 of Section 10 of the *Non-domestic BSCG*).

6.6.3 Consequential improvement

Where work subject to a building warrant includes a new system or an alteration or extension to an existing system it provides an opportunity to review and improve the overall system. Guidance on the extent to which improvement should be made is given in Annex 6.D of the non-domestic Technical Handbook – *Improvement to the energy performance of existing building services when carrying out building work*.

6.7 Commissioning building services (domestic and non-domestic)

**Mandatory standard 6.7** - *Every building must be designed and constructed in such a way that energy supply systems and building services which use fuel or power for heating, lighting, ventilating and cooling the internal environment and heating the water, are commissioned to achieve optimum energy efficiency.*

This standard does not apply to:

a. major power plants serving the National Grid

b. the process and emergency lighting components of a building

c. heating provided solely for the purpose of frost protection or

d. energy supply systems used solely for industrial and commercial processes, leisure use and emergency use within a building.
6.7.1 Inspection and commissioning

Building services installations should be inspected and commissioned in accordance with manufacturers’ instructions to ensure optimum energy efficiency. Commissioning carried out in accordance with the CIBSE commissioning codes [www.cibse.org](http://www.cibse.org) and BSRIA commissioning guides [www.bsria.co.uk](http://www.bsria.co.uk) are considered to meet the objectives of the guidance.

Guidance on inspection and assessment of air conditioning systems is contained in the CIBSE Technical Memorandum 44 (TM44) *Inspection of air conditioning systems*.

**Requirements of BS 7671**

Part 6 of *BS 7671* contains requirements for inspection and testing electrical installation work (refer to Section 2.4 Safety – of this publication).

Regulation 641.1 requires that the installed work is fully inspected before testing is undertaken, and the part of the installation being inspected is disconnected from the supply.

Regulation 642.2 requires confirmation that the installed electrical equipment complies with the relevant British or Harmonised Standard, and is selected and installed in accordance with *BS 7671* (including manufacturers’ instructions) and is not damaged or defective.

NICEIC certificates (and report forms) contain schedules of items to be inspected, which must be completed and signed.
6.8 Written information (domestic and non-domestic)

Mandatory Standard 6.8 - The occupiers of a building must be provided with written information by the owner:

a. on the operation and maintenance of the building services and energy supply systems and

b. where any air-conditioning system in the building is subject to regulation 17, stating a time-based interval for inspection of the system.

This standard does not apply to:

- major power plants serving the National Grid
- buildings which do not use fuel or power for heating, lighting, ventilating and cooling the internal environment and heating the water supply services
- the process and emergency lighting components of a building
- heating provided solely for the purpose of frost protection
- lighting systems in a domestic building or
- energy supply systems used solely for industrial and commercial processes, leisure use and emergency use within a building.

6.8.1 Written information (domestic and non-domestic)

The intention of this standard is to support the energy efficient operation of building services, therefore, to encourage optimum energy efficiency, written information should be made available to the occupier on the operation and maintenance of the heating, ventilation, cooling and hot water service systems.

Regulation 17 imposes a continuing requirement to regularly inspect air conditioning systems. Both new and existing systems should be inspected by an accredited expert at intervals ranging between 3 to 5 years (Clause 0.17.3 of the General sections of the Technical Handbooks refer).
For non-domestic buildings, a logbook containing information about all aspects of energy system operation and maintenance should be provided in order to support the building user to optimise the use of fuel. The logbook should include detailed information on building services plant and controls.

CIBSE Technical Memorandum 31 (TM31) www.cibse.org provides guidance on the presentation of a logbook, and the logbook information should be presented in this or a similar manner.

**Note:** In addition to the information provided under Clause 6.8.1, for each new dwelling Clause 6.8.2 requires a quick start guide to be provided, identifying all installed building services, the location of controls and stating how systems should be used for optimum efficiency. Further information is contained in Section 7 of the Technical Handbooks - Sustainability.

### 6.8.3 Work on existing buildings (and 6.8.2 non-domestic)

Where alterations are carried out to building services on a piecemeal basis, the alterations may not result in optimum energy efficiency being attained for the whole system. In this case, the person responsible for the commissioning should provide a list of recommendations to improve the overall energy efficiency of the system to the occupier or owner of the building.
6.10 Metering (non-domestic)

**Mandatory Standard 6.10** - Every building must be designed and constructed in such a way that each building or part of a building designed for different occupation is fitted with fuel and power meters.

This standard does not apply to:

a. domestic buildings,

b. district or block heating systems where each part of the building designed for different occupation is fitted with heat meters, or

c. heating fired by solid fuel or biomass.

6.10.1 and 6.10.2 Metering and sub-metering

Meters which are easily accessible to the building operator should be provided in all buildings to record fuel and power use, and in all but the simplest buildings sub-metering should be provided to allow fuel and power consumption, such as electric, gas and oil, to be monitored.

**Note:** Where existing buildings contain units in different occupation, each unit should have metering installed (Clause 6.10.3 of the non-domestic Technical Handbook refers).

Metering should be based upon guidance on the development and implementation of a metering strategy within CIBSE TM 39 - building energy metering - www.cibse.org/

A metering strategy should consider the cost, practicality, and value of the information gained by detailed metering against potential future energy savings.
7. Sustainability (domestic and non-domestic)

**Mandatory Standard 7.1** - Every building must be designed and constructed in such a way that:

a. with regard to a dwelling, or school building containing classrooms, a level of sustainability specified by the Scottish Ministers in respect of carbon dioxide emissions, resource use, building flexibility, adaptability, and occupant well-being is achieved,

b. with regard to a non-domestic building other than a school building containing classrooms, a level of sustainability specified by the Scottish Ministers in respect of carbon dioxide emissions is achieved, and

c. a statement of the level of sustainability achieved is affixed to the dwelling or non-domestic building.

This standard does not apply to:

a. alterations and extensions to buildings,

b. conversions of buildings,

c. buildings that are ancillary to a dwelling that are stand-alone having an area less than 50 m$^2$,

d. buildings which will not be heated or cooled other than by heating provided solely for the purpose of frost protection,

e. buildings intended to have a life not exceeding the period specified in Regulation 6, or

f. conservatories.

7.0 Introduction

The aim of Section 7 is to encourage the sustainable design and construction of buildings by embedding sustainability into the Building Regulations.

The measures of sustainability covered by Section 7 can be divided as follows:

- Energy efficiency: reducing the energy consumption of buildings.
- Material use and waste: designing for well-being.
The standards within Sections 1-6 of the Technical Handbooks deliver a level of sustainability in a number of areas particularly energy efficiency, so in recognition of this, compliance with the functional standards set out in Sections 1-6 of the Technical Handbooks achieves a Bronze level of sustainability. Furthermore, to encourage building designers to exceed the minimum standards further optional upper levels of sustainability, Silver or Gold, can be achieved by meeting the required level in the following aspects:

1. CO₂ emissions
2. Energy for space heating
3. Energy for water heating
4. Water use efficiency
5. Optimising performance
6. Flexibility and adaptability
7. Well-being and security
8. Material use and waste

For details on the the levels of sustainability and the individual aspects listed refer to Section 7 of the Technical Handbooks.

Sample of sustainability label

The label should be located in an accessible position such as a meter cupboard (Clause 7.1.0 of the Technical Handbooks refer).

Note: A Bronze Active label shows that in addition to achieving the standards set out in Sections 1-6 of the Technical Handbooks, the building also includes low or zero carbon technology such as photovoltaic panels or heat pumps to satisfy Standard 6.1.
Annex 1 - Exempted buildings and services, fittings and equipment (regulation 3, Schedule 1 of the Building (Scotland) Regulations 2004 refers)

There is no need for a building warrant and standards do not apply to such classes other than the exceptions as stated in the following table.

Electrical work associated with any of the building types or works (listed in the following table) other than the exceptions listed does not require a warrant and is not required to meet regulations 8 to 12 of the Scottish Building Regulations. Reference must also be made to regulation 5, Schedule 3 of the Building (Scotland) Regulations 2004 (see Annexes 2 and 3 of this guide) for further exemptions from the need for a building warrant.

WARNING: Notwithstanding this exemption from a warrant and compliance with the building regulations, BS 7671 applies to all electrical installations. The responsibility for ensuring compliance with this British Standard lays with the building owner and/or his/her contractor.

<table>
<thead>
<tr>
<th>Buildings or work controlled by other legislation (types 1-3)</th>
<th>Except - sub-paragraphs (1) and (2) do not include any building or, as the case may be, any part of a building as is referred to in, respectively, sub-paragraph or (2) in relation to which –</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Any building in which explosives are manufactured or stored under a licence granted under the Explosives Regulations 2014 where the whole building is used for that manufacture or storage.</td>
<td>a. no minimum separation distance is required to be maintained by virtue of regulation 27(2)(a) or (3) of the Explosives Regulations 2014, or</td>
</tr>
<tr>
<td>2 Where only a part of a building is used for the manufacture or storage of explosives under a licence granted under the Explosive Regulations 2014, that part of the building where the licence specifies that that manufacture or storage may take place.</td>
<td>b. a minimum separation distance of 0 metres is prescribed by virtue of regulation 27(1) of, and Schedule 5 to the Explosive Regulations 2014 and the requirement for the assent of the local authority under regulation 13(3) of those Regulations did not apply by virtue of regulation 13(4)(a) of those Regulations.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2</td>
<td>A building erected on a site which is subject to licensing under the Nuclear Installations Act 1965.</td>
</tr>
<tr>
<td></td>
<td>Except - A dwelling, residential building, office, canteen or visitor centre.</td>
</tr>
<tr>
<td>3</td>
<td>A building included in the schedule of monuments maintained under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979.</td>
</tr>
<tr>
<td></td>
<td>Except - A dwelling or residential building.</td>
</tr>
<tr>
<td></td>
<td><strong>Protective Works (type 4)</strong></td>
</tr>
<tr>
<td>4</td>
<td>Protective works subject to control by regulation 13.</td>
</tr>
<tr>
<td></td>
<td><strong>Buildings or work not frequented by people (types 5-8)</strong></td>
</tr>
<tr>
<td>5</td>
<td>A building into which people cannot or do not normally go.</td>
</tr>
<tr>
<td></td>
<td>Except - a) A building within 6 metres or the equivalent of its height (whichever is the less) of the boundary.</td>
</tr>
<tr>
<td></td>
<td>b) A wall or fence.</td>
</tr>
<tr>
<td></td>
<td>c) A tank, cable, sewer, drain or other pipe above or below ground for which there is a requirement in these Regulations.</td>
</tr>
<tr>
<td>6</td>
<td>Detached fixed plant or machinery or a detached building housing only fixed plant or machinery, the only normal visits to which are intermittent visits to inspect or maintain the fixed plant or machinery.</td>
</tr>
<tr>
<td></td>
<td>Except - A building within 1 metre of a boundary.</td>
</tr>
<tr>
<td></td>
<td><strong>Agricultural and related buildings (types 7 &amp; 8)</strong></td>
</tr>
<tr>
<td>7</td>
<td>An agricultural greenhouse or other building of mainly translucent material used mainly for commercial growing of plants.</td>
</tr>
<tr>
<td></td>
<td>Except - A building used to any extent for retailing (including storage of goods for retailing) or exhibiting.</td>
</tr>
<tr>
<td><strong>Building (Scotland) Regulations</strong></td>
<td></td>
</tr>
<tr>
<td>-----------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>8</strong> A single-storey detached building used for any other form of agriculture, fish farming or forestry.</td>
<td></td>
</tr>
<tr>
<td><strong>Except</strong> -</td>
<td></td>
</tr>
<tr>
<td>a) A building used to any extent for retailing (including storage for retailing) or exhibiting.</td>
<td></td>
</tr>
<tr>
<td>b) A building exceeding 280 square metres in area.</td>
<td></td>
</tr>
<tr>
<td>c) A building within 6 metres or the equivalent of its height (whichever is the less) of a boundary.</td>
<td></td>
</tr>
<tr>
<td>d) A dwelling, residential building, office, canteen or visitor centre.</td>
<td></td>
</tr>
<tr>
<td>e) A dungstead or farm effluent tank.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Works of civil engineering construction (type 9)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9</strong> A work of civil engineering construction, including a dock, wharf, harbour, pier, quay, sea defence work, lighthouse, embankment, river work, dam, bridge, tunnel, filter station or bed, inland navigation, reservoir, water works, pipe line, sewage treatment works, works provided to meet a requirement gas holder or main, electricity supply line and supports, any bridge embankment or other support to railway lines and any signalling or power lines and supports, and a fire practice tower.</td>
</tr>
<tr>
<td><strong>Except</strong> -</td>
</tr>
<tr>
<td>a) A bridge or tunnel forming part of an escape route or an access route provided to meet a requirement of these regulations.</td>
</tr>
<tr>
<td>b) A private sewage treatment works provided to meet a requirement of these regulations.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Buildings of a specialised nature (type 10-12)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10</strong> A building essential for the operation of a railway including a locomotive or carriage shed, or for the operation of any other work of civil engineering contained in type 9 and erected within the curtilage of such a railway or work.</td>
</tr>
<tr>
<td><strong>Except</strong> -</td>
</tr>
<tr>
<td>a) A signalling and control centre for a railway or dock.</td>
</tr>
<tr>
<td>b) A building to which the public is admitted, not being a building exempted by type 11 of this Schedule.</td>
</tr>
<tr>
<td>c) A dwelling, residential building, office, canteen, or warehouse.</td>
</tr>
</tbody>
</table>
### Annex

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Exceptions</th>
</tr>
</thead>
</table>
| 11      | Single-storey detached road or rail passenger shelter or a telephone kiosk which in so far as it is glazed complies with the requirements of regulation 9 and paragraph 4.8 of Schedule 5. | Except -  
a) A building having a floor area exceeding 30 square metres.  
b) A building containing a fixed combustion appliance installation.                                                              |
| 12      | A caravan or mobile home within the meaning of the Caravan Sites and Control of Development Act 1969[^7], or a tent, van or shed within the meaning of Section 73 of the Public Health (Scotland) Act 1897. | Except -  
Any wastewater disposal system serving a building of this type.                                                                                                                                 |
|         | **Small buildings (type 13)**                                                                                                                                                                                 |                                                                                                                                                                                                           |
| 13      | A detached single-storey building having an area not exceeding 8 square metres.                                                                                                                                 | Except -  
a) A dwelling or residential building.  
b) A building ancillary to and within the curtilage of a dwelling.  
c) A building within 1 metre of a boundary.  
d) A building containing a fixed combustion appliance installation or sanitary facility.  
e) A wall or fence. |
|         | **Construction and development buildings (type 14 & 15)**                                                                                                                                                     | Except -  
A building containing sleeping accommodation.                                                                                                                                                         |
| 14      | A building used only by people engaged in the construction, demolition or repair of any building or structure during the course of that work.                                                             |                                                                                                                                                                                                           |
| 15      | A building used in connection with the letting or sale of any building under construction until such time as the letting or sale of all related buildings is complete. | Except -  
A building containing sleeping accommodation.                                                                                                                                                      |
### Temporary buildings (type 16)

16 A building which, during any period of 12 months, is either erected or used on a site -

- a) for a period not exceeding 28 consecutive days;
- b) or for a number of days not exceeding 60, and any alterations to such buildings.

### Buildings ancillary to houses (types 17-19)

17 A detached single-storey building ancillary to and within the curtilage of a house.

- Except -
  - a) A building exceeding 8 square metres in area
  - b) A building within 1 metre of the house unless it is at least 1 metre from any boundary.
  - c) A building containing sleeping accommodation.
  - d) A building containing a flue, a fixed combustion appliance installation or sanitary facility.
  - e) A wall or fence.

18 A single-storey building attached to an existing house, which is ancillary to the house and consists of a **conservatory** or **porch** which insofar as it is glazed complies with the requirements of regulation 9 and paragraph 4.8 of Schedule 5.

- Except -
  - a) A building exceeding 8 square metres in area.
  - b) A building containing a flue, a fixed combustion appliance installation or sanitary facility.
  - c) A building within 1 metre of a boundary.

19 Any single-storey building which is detached, or is attached to an existing house and which is ancillary to the house and consists of a **greenhouse**, **carport** or **covered area**.

- Except -
  - a) A building exceeding 30 square metres in area.
  - b) A building containing a flue, a fixed combustion appliance installation or sanitary facility.
### Buildings ancillary to flats or maisonettes (type 20)

<table>
<thead>
<tr>
<th>20</th>
<th>A detached single-storey building ancillary to and within the curtilage of a flat or maisonette.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Except -</td>
</tr>
<tr>
<td></td>
<td>a) A building exceeding 8 square metres in area.</td>
</tr>
<tr>
<td></td>
<td>b) A building within 3 metres of the flat or maisonette or within 3 metres of any other part of the building containing the flat or maisonette.</td>
</tr>
<tr>
<td></td>
<td>c) A building containing a flue, a fixed combustion appliance installation or sanitary facility.</td>
</tr>
<tr>
<td></td>
<td>d) A wall or fence.</td>
</tr>
<tr>
<td></td>
<td>e) A swimming pool deeper than 1.2 m.</td>
</tr>
</tbody>
</table>

### Paved areas (type 21)

<table>
<thead>
<tr>
<th>21</th>
<th>A paved area or hardstanding.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Except -</td>
</tr>
<tr>
<td></td>
<td>a) A paved area or hardstanding exceeding 50 square metres in area.</td>
</tr>
<tr>
<td></td>
<td>b) A paved area forming part of an access to meet a requirement of these regulations.</td>
</tr>
</tbody>
</table>
### Annex 2 – Guidance on electrical work not requiring a warrant - Domestic buildings

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*Note: Although exempt from the warrant the work listed still needs to comply with the Building Regulations.*

<table>
<thead>
<tr>
<th>DOMESTIC BUILDINGS</th>
<th>WORK TO EXISTING BUILDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type [1]</td>
</tr>
<tr>
<td><strong>WORK ACTIVITY</strong></td>
<td></td>
</tr>
<tr>
<td>Repairs and replacement</td>
<td></td>
</tr>
<tr>
<td>Re-wiring [2]</td>
<td>24</td>
</tr>
<tr>
<td>Electrical fixtures, e.g. luminaries</td>
<td>24</td>
</tr>
<tr>
<td>New work</td>
<td></td>
</tr>
<tr>
<td>Electrical work affected by demolition or alteration of the roof, external walls or elements of structure</td>
<td>1</td>
</tr>
<tr>
<td>Electrical work adversely affecting a separating wall, e.g. recessed sockets</td>
<td>1</td>
</tr>
<tr>
<td>New power socket-outlets</td>
<td>1</td>
</tr>
<tr>
<td>Mains operated fire alarm system</td>
<td>1</td>
</tr>
<tr>
<td>Electrical work to automatic opening ventilators (including auto-detection)</td>
<td>1</td>
</tr>
<tr>
<td>Electrically operated locks</td>
<td>1</td>
</tr>
<tr>
<td>Wiring to artificial lighting</td>
<td>1</td>
</tr>
<tr>
<td>DOMESTIC BUILDINGS</td>
<td>WORK TO EXISTING BUILDINGS</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Wiring to emergency lighting</td>
<td>1 required not required required</td>
</tr>
<tr>
<td>Electrical work associated with sprinkler system</td>
<td>1 required not required required</td>
</tr>
<tr>
<td>Electrical work associated with new boiler (large)</td>
<td>1 required not required required</td>
</tr>
<tr>
<td>Electrical work associated with new boiler (small)</td>
<td>6 not required not required not required</td>
</tr>
<tr>
<td>Electrical work associated with new shower</td>
<td>11, 12 not required not required not required</td>
</tr>
<tr>
<td>Electrical work associated with new extract fan</td>
<td>13 not required not required not required</td>
</tr>
<tr>
<td>Extra-low voltage installations</td>
<td>22 not required not required not required</td>
</tr>
</tbody>
</table>

**Note 1:** Building work type as referenced in Schedule 3.

**Note 2:** A building warrant is not required for rewiring where it is a repair or replacement works to a level equal to the installation (or part thereof) being repaired or replaced.
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**Note:** Although exempt from the warrant the work listed still needs to comply with the Building Regulations.

<table>
<thead>
<tr>
<th>NON-DOMESTIC BUILDINGS</th>
<th>WORK TO EXISTING BUILDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK ACTIVITY</td>
<td>non-residential buildings with a storey, or creating a storey, not more than 7.5 m</td>
</tr>
<tr>
<td></td>
<td>type [1] no public access</td>
</tr>
<tr>
<td>Repairs and replacement</td>
<td></td>
</tr>
<tr>
<td>Re-wiring [3]</td>
<td>24 not required</td>
</tr>
<tr>
<td>New work</td>
<td></td>
</tr>
<tr>
<td>Electrical work affected by demolition or alteration of the roof, external walls or elements of structure</td>
<td>2 required</td>
</tr>
<tr>
<td>Electrical work adversely affecting a separating wall, e.g. recessed sockets</td>
<td>2 required</td>
</tr>
<tr>
<td>Electrical work adversely affecting a loadbearing wall</td>
<td>2 required</td>
</tr>
<tr>
<td>New power socket-outlets</td>
<td>2 not required</td>
</tr>
<tr>
<td>Automatic fire detection system</td>
<td>2 not required</td>
</tr>
<tr>
<td>Electrical work to automatic opening ventilators</td>
<td>2 not required</td>
</tr>
<tr>
<td>Electrical work to automatic fire dampers</td>
<td>2 not required</td>
</tr>
<tr>
<td>Electrically operated locks</td>
<td>2 not required</td>
</tr>
</tbody>
</table>
## Annex

<table>
<thead>
<tr>
<th>NON-DOMESTIC BUILDINGS</th>
<th>WORK TO EXISTING BUILDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORK ACTIVITY</td>
<td>non-residential buildings with a storey, or creating a storey, not more than 7.5 m</td>
</tr>
<tr>
<td></td>
<td>type [1]</td>
</tr>
<tr>
<td>Wiring to emergency lighting</td>
<td>2</td>
</tr>
<tr>
<td>Outdoor luminous tube signs [4]</td>
<td>2</td>
</tr>
<tr>
<td>Electrical work associated with new boiler (large)</td>
<td>2</td>
</tr>
<tr>
<td>Electrical work associated with new boiler (small)</td>
<td>6</td>
</tr>
<tr>
<td>Electrical work associated with new shower</td>
<td>11, 12</td>
</tr>
<tr>
<td>Electrical work associated with new extract fan</td>
<td>13</td>
</tr>
<tr>
<td>Extra low voltage installations</td>
<td>22</td>
</tr>
</tbody>
</table>

**Note 1:** Building work type as referenced in Schedule 3.

**Note 2:** Non-residential buildings to which the public does not have access may include:
- Existing offices
- Existing storage buildings
- Existing industrial buildings e.g. factories and workshops
- Existing assembly and entertainment buildings not open to the public e.g. some educational buildings and private members clubs

Non-residential buildings to which the public has access may include:
- Existing assembly and entertainment buildings open to the public e.g. community schools, pubs and clubs.

**Note 3:** A building warrant is not required for rewiring where it is a repair or replacement works to a level equal to the installation (or part thereof) being repaired or replaced.

**Note 4:** Subject to the Town and Country Planning (Control of Advertisement) (Scotland) Regulations 1984.
Annex 4 - Conversions

With reference to Schedule 2 of the Building (Scotland) Regulations 2004, the following listed items are examples that might be considered conversions subject to the requirements of the regulations, changes in the occupation or use of a building:

a) to create a dwelling, dwellings or a part thereof, such as barn or warehouse conversions, or indeed changing an attic space into a room

b) ancillary to a dwelling to increase the area of human occupation, such as changing a garage into a room

c) which alters the number of dwellings in the building, such as the sub-division of a large property into flats or indeed turning attached properties into a single dwelling

d) a domestic building into any other type of building, such as changing a house into shop with storage space above

e) a residential building to any other type of building, such as changing a hotel into a block of flats

f) a residential building which would involve a significant alteration of the characteristics of the persons who occupy, or who will occupy the building, or which significantly increase the number of people occupying, or expected to occupy, the building, such as the use of a hotel as a residential care home

g) a building so that it becomes a residential building, such as the conversion of office space into a hostel

h) an exempt building to a building that is not so exempt, such as converting a light house into a dwelling or indeed into a visitor centre or similar open to the public

i) a building to allow access to the public where previously there was none, such as the conversion of a farm building into a shop

j) a building to accommodate parts in different occupation where previously it was not so occupied, such as the use of a single shop for use by two different businesses.
Annex 5 – The Building (Scotland) Regulations 2004 (applicable to electrical installation work)

The following regulations from the Building (Scotland) Regulations 2004 are applicable to electrical installation work:

Regulation 8 Fitness and durability of materials and workmanship

1. ‘Work to every building designed, constructed and provided with services, fittings and equipment to meet a requirement of regulations 9 to 12 must be carried out in a technically proper and workmanlike manner, and the materials used must be durable and fit for their intended purpose.’

2. All materials, services, fittings and equipment used to comply with a requirement of regulations 9 to 12 must, so far as reasonably practicable, be sufficiently accessible to enable any necessary maintenance or repair work to be carried out.’

Regulation 9 Standards applicable to construction

‘Construction shall be carried out so that the work complies with the applicable requirements of Schedule 5.’ (Building Standards applicable to design and construction.)

Relevant mandatory standards from Schedule 5 along with guidance are listed in Section 1 (Guidance on meeting the requirements of the mandatory standards from Schedule 5 of regulation 9 of the Building (Scotland) Regulations 2004).

Regulation 10 Standards applicable to demolition

1. ‘Every building to be demolished must be demolished in such a way that all service connections to the building are properly closed off and any neighbouring building is left stable and watertight.’
2. ‘When demolition work has been completed and, where no further work is to commence immediately, the person who carried out that work shall ensure that the site is –
   
a) immediately graded and cleared; or

b) provided with such fences, protective barriers or hoardings as will prevent access thereto.’

Regulation 11 Standards applicable to provision of services, fitting or equipment

‘Every service, fitting or piece of equipment provided so as to serve a purpose of the regulations shall be so provided in such a way as to further those purposes.’

Regulation 12 (refer to Conversions - Annex 4)
Annex 6 – Sample NICEIC Certification Scotland Certificate of Construction

PART 1: DETAILS OF THE APPROVED BODY, CLIENT AND INSTALLATION

Details of the Approved Body
- Registration No.
- Branch No.
- Trading Title
- Address
- Postcode
- Tel No.
- Fax No.

Details of Client
- Contractor Reference Number (CRN)
- Name
- Address
- Postcode
- Tel No.
- Fax No.

Details of the Installation
- Occuser:
- Address
- Postcode
- Tel No.
- Fax No.

PART 2: DETAILS OF THE ELECTRICAL INSTALLATION WORK TO BS 7671 COVERED BY THIS CERTIFICATE OF CONSTRUCTION

- Date works completed:
- Building use:
- Domestic: [ ]
- Non-Domestic: [ ]
- Mixed use: [ ]
- Is this part of a multiple: Yes or No: [ ]
- Plot: [ ]
- No. of: [ ]
- Is this the final plan: Yes or No: [ ]
- The installation is:
- New: [ ]
- An addition: [ ]
- An alteration: [ ]
- Where necessary, continue on a separate numbered page: Page No(s): [ ]

PART 3: DECLARATION

A) To be completed by the Approved Certifier of Construction
1. I, being the Approved Certifier, certify that the electrical installation included in the construction work described in PART 2 of this Certificate complies with the relevant parts of the Building (Scotland) Regulations 2004, as amended, and provided by the Scottish Government Building Standards Division as competent to certify the construction of such work.
2. I, being the Approved Certifier, certify that the person who has signed A) of PART 3 of this Certificate is an Approved Certifier of Construction (Electrical Installations to BS 7671). This body is registered by the Scottish Government Building Standards Division to provide certification services for Certification of Construction (Electrical Installations to BS 7671) and employs at least one approved certifier under the scheme.

B) To be completed by the Certification Co-ordinator of the Approved Body
1. I, being the Certification Co-ordinator, confirm that the person who has signed A) of PART 3 of this Certificate is an Approved Certifier of Construction (Electrical Installations to BS 7671). This body is registered by the Scottish Government Building Standards Division to provide certification services for Certification of Construction (Electrical Installations to BS 7671) and employs at least one approved certifier under the scheme.

Name (capitalised): [ ]
Signature: [ ]
Date: [ ]

*Where applicable
The following information is a summary of the key points contained in the Scottish Government Statutory Guidance on Electrical Installations and Appliances in Private Rented Property.

From December 1st, 2015, Private landlords in Scotland were required by law to ensure that a rented house achieves compliance with the Repairing Standard. This includes, amongst other requirements, ensuring the electrical safety of such properties is maintained through regular electrical safety inspections by competent persons.

Purpose of Electrical Safety Inspection

The purpose of an electrical safety inspection is to:

- confirm, so far as reasonably practicable that the electrical installation, including electrical fixtures and fittings, and appliances supplied by the landlord are safe for continued service, and

- identify any work relating to the electrical installation, or the appliances provided, that is required to ensure they are safe for continued service.

The electrical safety inspection

The safety inspection has two separate elements:

- An Electrical Installation Condition Report (EICR) on the safety of the electrical installation.

- A Portable Appliance Test (PAT) - on those appliances provided by the landlord for use by the tenant.

Any electrical installation, accessories or equipment which fails to pass the electrical safety inspection must be replaced or repaired immediately to comply with the Repairing Standard.

**Note:** An appliance that was purchased new less than one year before the date of the test does not require to be included in that PAT test.
Electrical Installation Condition Report EICR

The landlord is responsible for ensuring the person completing an EICR is competent to undertake the work. In Scotland, this will usually mean a person registered with an Approved Body to carry out such work, such as NICEIC. Where the person is not registered with an Approved Body the landlord should use the Checklist provided in Annex A of the statutory guidance to obtain evidence of their competency.

The EICR must cover the electrical installation wiring and fixed electrical equipment including:

- consumer unit(s)
- accessories (switches and socket-outlets)
- light fittings
- fixed electrical heating equipment (e.g. storage or panel heaters)
- boilers and other heat producing equipment
- hard-wired smoke and fire detectors.

Any tenant under a new tenancy must be provided with a copy of an EICR before the tenancy commences. However, an Electrical Installation Certificate may be provided in place of an EICR, provided that the date of next inspection indicated on the certificate has not elapsed.

An EICR is acceptable, whether or not information on appliances is included, as long as the remedial work required for safety issues identified as Code 1 or Code 2 items on the Report, have been addressed.


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\(^9\) *Electrical installation condition reporting: Classification Codes for domestic and similar electrical installations* (ESF Best Practice Guide no. 4), www.electricalsafetyfirst.org.uk/professional-resources
Portable Appliance Testing

The duty to carry out electrical safety inspections only applies to those appliances provided by the landlord for the tenants use.

Portable electrical appliances are items that can be moved, while either connected or disconnected from an electrical supply. They are generally connected via a plug, but a freestanding appliance, such as a cooker or gas boiler, should be tested even if it is permanently connected to the supply. All appliances not checked as part of the EICR, such as those integrated into kitchen units, should be PAT tested. Including items such as:

- electrical white goods (such as refrigerators and washing machines),
- electrical brown goods (such as televisions and DVD players),
- electric fires that are not fixed in place,
- kitchen appliances, such as toasters and kettles,
- hand held electrical equipment, such as hairdryers.

The PAT testing must be completed by a competent person, this means either:

- a skilled person (electrically) as defined in the third Amendment of BS 7671, or
- a person who has completed appropriate PAT training.

Frequency of the electrical safety inspection

An electrical safety inspection must be carried out:

- before a tenancy starts, and
- during the tenancy, at intervals of no more than 5 years from the date of the previous inspection.

Note: Intervals of less than 5 years are not precluded and may be required by the Inspector. A PAT test must be carried out annually on rented accommodation.
Unless specified, the electrical safety inspection does not have to be completed immediately before a new tenancy begins or every time a new tenancy starts, as long as an inspection has been carried out in the period of 5 years before the tenancy starts.

The date for retesting appliances is usually set during the PAT test and will usually be more frequent than five years. Where a PAT is not carried out at the same time as the EICR the Inspector should confirm that there is a record of appliance testing and the re-test date has not elapsed.

Copy of inspection

The landlord must receive and keep a copy of the EICR and PAT record for six years. A copy of the most recent EICR and PAT record must be given to the tenant before their tenancy starts. If an inspection is carried out during a tenancy a copy relating to that inspection must be given to the tenant.

Good Practice

In addition to the statutory guidance, it is recommended that a visual electrical safety check is carried out annually in a rented property. The purpose of the safety inspection is to check for signs of overheating, loose fixings, damaged or missing parts that may present a risk of injury or fire.

The visual checks should include:

- consumer units
- accessories light switches and socket-outlets
- visible cables
- electrical appliances for signs of damage and deterioration and to confirm that plugs and cables are secure.
For such purposes, the NICEIC *Domestic Visual Condition Report* may be used by NICEIC Approved Contractors.

Alternatively, Electrical Safety First provide a *Landlords Interim Checklist* which may be used by the landlord, or the landlords representative, to undertake a visual safety check on their rented premises. The checklist can be downloaded from [www.electricalsafetyfirst](http://www.electricalsafetyfirst).

Appliances should be checked for a CE Mark, which is product manufacturer’s claim that it meets all the requirements of European Union legislation. (Landlords should register appliances so that they receive notice should the appliance become subject to a recall by the manufacturer - [www.registermyappliance.org.uk](http://www.registermyappliance.org.uk)).

In addition, the operation of the following safety devices should be confirmed by pressing the integral test button:

- Residual Current Devices (quarterly check)
- Smoke or heat detectors
- Carbon monoxide detectors

For details on the provision of CO detectors refer to the: *Scottish Government Statutory Guidance for the provision of CO alarms in private rented housing* ([www.gov.scot](http://www.gov.scot)).

More information about the Repairing Standard and the other elements that need to be met is available in the Advice Pack for Private Landlords. The Advice Pack is available online at [www.gov.scot](http://www.gov.scot).

For details on inspection and testing courses and PAT training refer to: [www.niceic.com](http://www.niceic.com)