

Introduction

1.2.6 The Building Regulations

England and Wales. The Building Regulations 2010

The Building Regulations 2010 (Statutory Instrument 2010 No. 2214) are made under powers provided in the Building Act 1984 and currently apply in England and Wales, but not Scotland or Northern Ireland.

The purpose of the Building Regulations is to provide for the health and safety of people in and around buildings and also provide for matters such as energy conservation and access and use.

In the Building Regulations the term “building work” means:

- a) the erection or extension of a building,
- b) the provision or extension of a controlled service or fitting in or in connection with a building,
- c) the material alteration of a building, or a controlled service or fitting,
- d) work required by regulation 6 (requirements relating to material change of use),
- e) the insertion of insulating material into the cavity wall of a building,
- f) work involving the underpinning of a building.

Schedule 1 of the Building Regulations describes the requirements relating to building work and material change of use as described in Regulations 4 & 6. These requirements are divided into the following parts:

Part A (Structural safety)

Part B (Fire safety)

Part C (Resistance to contaminants and moisture)

Part D (Toxic substances)

Part E (Resistance to sound)

Part F (Ventilation)

Part G (Sanitation, hot water safety and water efficiency)

- Part H** (Drainage and waste disposal)
- Part J** (Heat producing appliances)
- Part K** (Protection from falling)
- Part L** (Conservation of fuel and power)
- Part M** (Access to and use of buildings)
- Part N** (Glazing safety)
- Part P** (Electrical safety)

To provide the construction industry with guidance on how these requirements of the Building Regulations can be met, for each of the parts previously listed, the Department for Communities and Local Government (DCLG) publishes a series of Approved Documents.

The Approved Documents may be downloaded free-of-charge from

www.planningportal.gov.uk/buildingregulations/approveddocuments/

Two editions of Approved Document P, dealing with electrical safety, are available:

- the 2006 Edition,
- the 2013 Edition, which applies to work in England from 6 April 2013.

It should be noted that the power to make Building Regulations for Wales has been transferred to Welsh Ministers from 31st December 2011. The Building Regulations 2010 and related guidance such as the Approved Documents published prior to that date will continue to apply in Wales until Welsh Ministers decide that changes should be made. As a result of this transfer of power, for electrical installations in dwellings, the approved document used in England is different to that used in Wales. In England, the 2013 edition of Approved Document P is used whilst, in Wales, apart from 'excepted energy buildings¹', the 2006 edition is used.

¹Excepted energy buildings, as defined in *The Welsh Ministers (Transfer of Functions) (No. 2) Order 2009*, are energy infrastructure buildings and, for these buildings, the 2013 edition of Approved Document P is applicable.

3.4 The intake position

Fig 3.4, Fig 3.5, and Fig 3.6 give diagrammatic representations of the interface between the distributor's and the consumer's electrical equipment for TN-S, TN-C-S and TT systems, respectively. Typical arrangements for both overhead and underground supplies are shown.

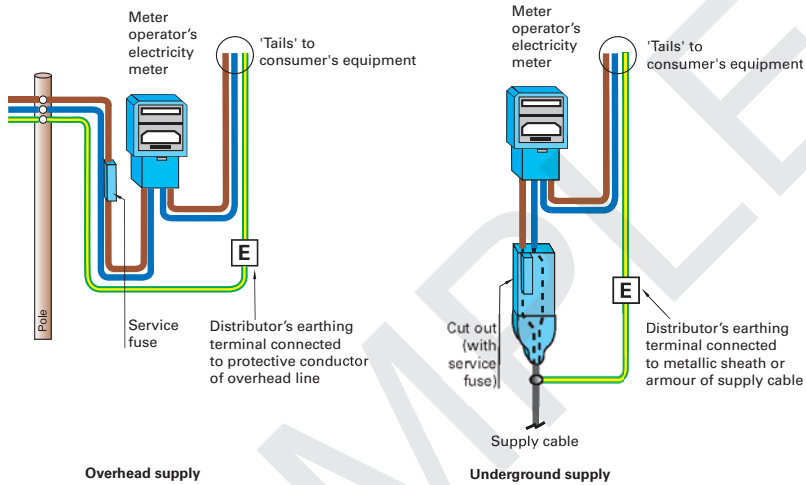


Fig 3.4 TN-S system.

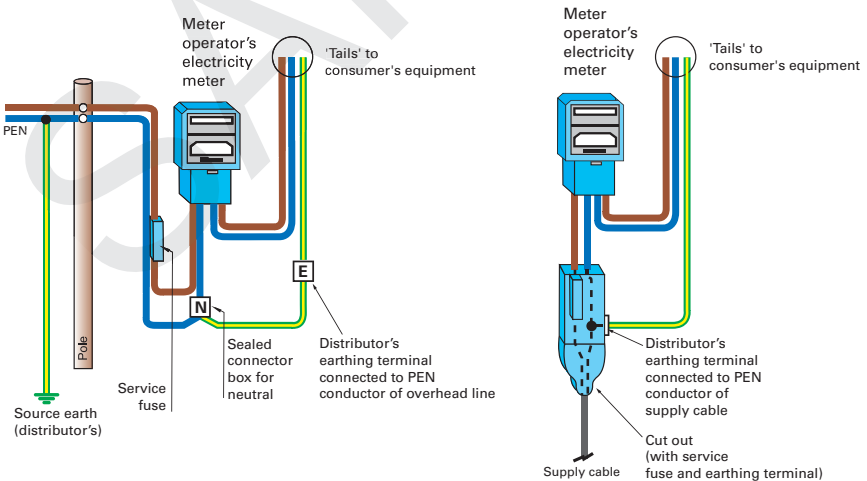


Fig 3.5 TN-C-S system.

Factors relating to installation of wiring systems and cables

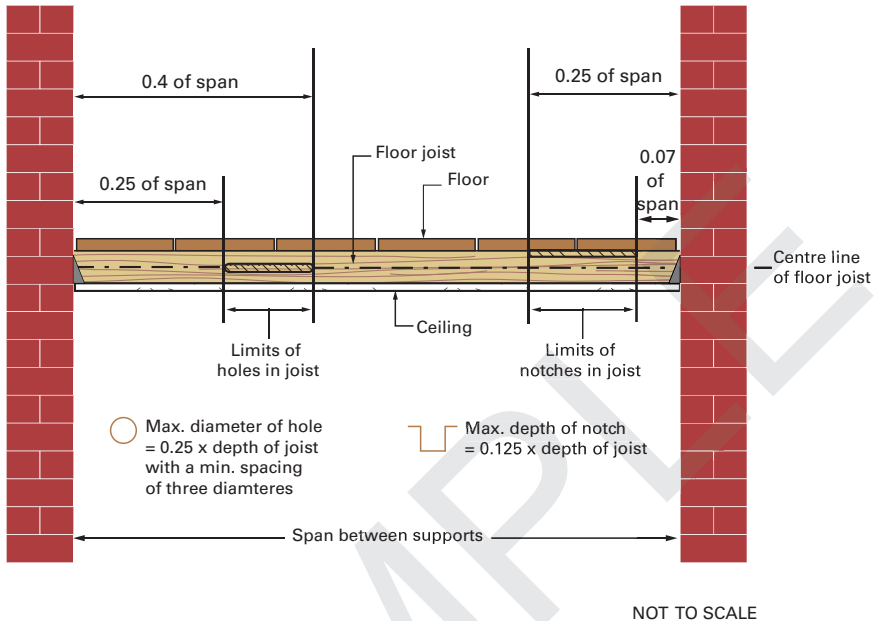


Fig 11.11 Acceptable positions for holes and notches in solid timber joists

Notches should:

- be no deeper than 0.125 times the depth of a joist; and
- not be cut closer to the support than 0.07 of the span, nor further away than 0.25 times the span.

Holes should be:

- no greater diameter than 0.25 times the depth of the joist; should be drilled at the neutral axis²; and
- not less than 3 diameters (centre to centre) apart; and
- located between 0.25 and 0.4 times the span from the support.

²The neutral axis of a joist lies along its centre line and is where the joist has neither a compressive or tensile stress.

It should be noted that notches or holes should not be cut in roof rafters, other than at supports where the rafter may be birdsmouthed³ to a depth not exceeding 0.33 times the rafter depth.

11.6.2 Chases in walls

The following requirements for chases in walls are given in paragraph 2C30 of Approved Document A (2004 edition, incorporating 2010 and 2013 amendments):

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.

Horizontal chases should not be deeper than $\frac{1}{6}$ of the thickness of the wall or leaf.

Chases should not be so positioned as to impair the stability of the wall, particularly where hollow blocks are used.

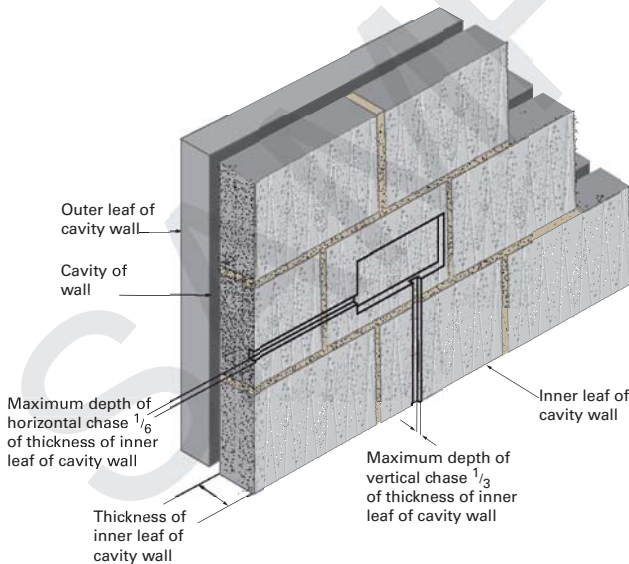


Fig 11.12 Examples of chases in the leaf of a cavity wall

³A woodworking joint generally used to connect a roof rafter to the top plate of a supporting wall

Special installations and locations

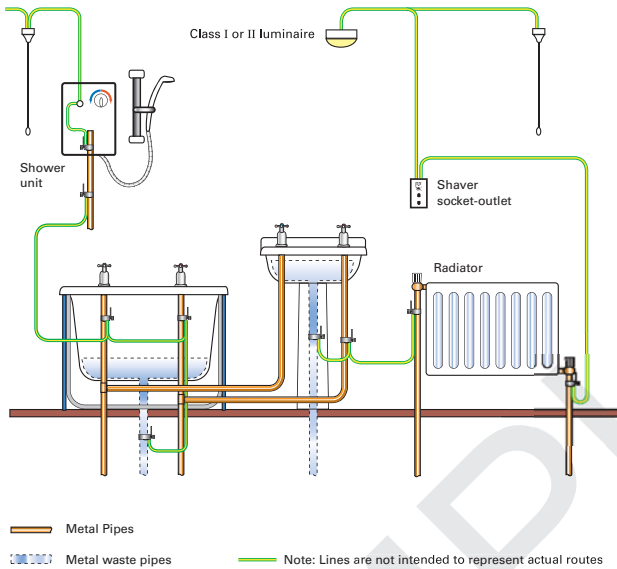


Fig 12.7 Examples of supplementary bonding applied in a location containing a bath

The requirements for supplementary equipotential bonding in a location containing a bath or shower apply only to the accessible extraneous-conductive-parts and to the protective conductor terminals of equipment.

The required supplementary bonding may be carried out either within the location containing the bath or shower or outside where it may be more aesthetically acceptable (such as in an adjoining roof void or an airing cupboard opening into, or adjoining, the room) but preferably close to the point of entry of the extraneous-conductive-parts into the room. (Regulation 701.415.2).

Metallic pipes solidly and reliably connected to each other within or adjacent to the special location (such as soldered pipes in an adjoining airing cupboard) might not need further supplementary bonding to each other.

A metallic bath generally requires supplementary bonding. Connections between hot and cold and waste pipes might only provide intermittent or fortuitous contact.

Supplementary bonding connections, as with all electrical connections or joints, should be:

- accessible for inspection, testing and maintenance (Regulation 526.3) apart from connections or joints made in one of the ways exempted by that Regulation, and
- identified by a permanent label at the point of connection of every bonding conductor to an extraneous-conductive-part (Regulation 514.13).

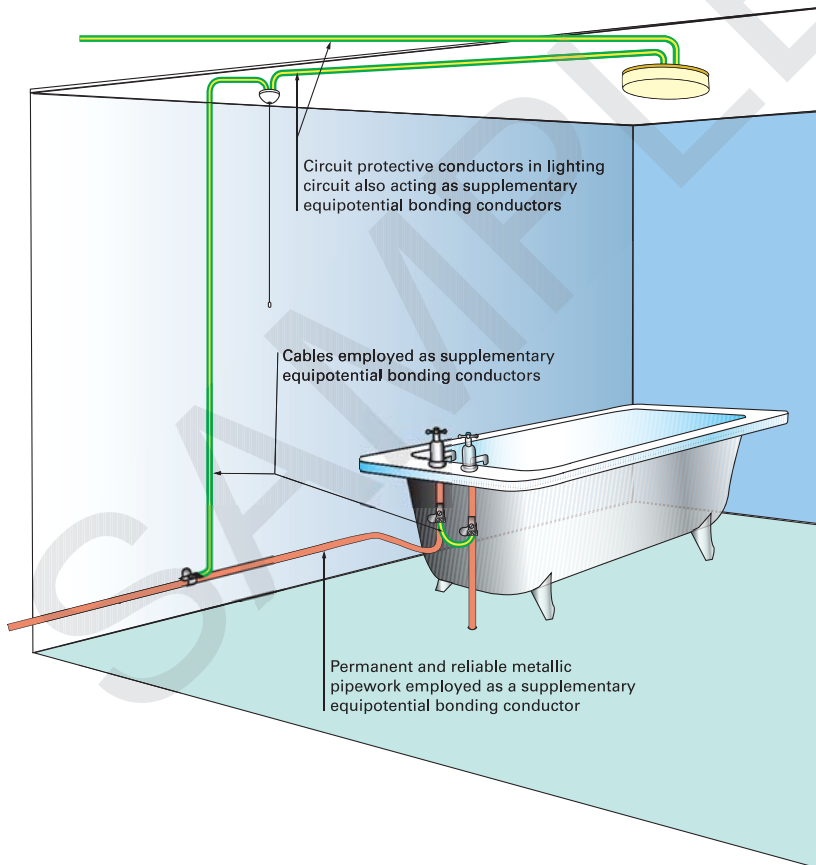


Fig 12.8 Supplementary bonding conductors in a bathroom

Final circuit information

Thermosetting insulated, and some types of mineral insulated, cables can operate with conductor temperatures well above 70 °C. Where such cables are to be connected to socket-outlets and fused connection units complying with *BS 1363*, the cables are to be selected so that the conductor operating temperature is not in excess of 70 °C. In this respect, the conductor size of thermosetting insulated cable must not be less than the size that would have been required for thermoplastic (PVC) insulated cable.

Similarly, the conductor size of mineral insulated cable must not be less than that required for a mineral insulated cable intended to operate at not more than 70 °C (that is, a mineral insulated cable that is bare and exposed to touch or has an overall thermoplastic (PVC) covering). The restriction of conductor temperature to not more than 70 °C may also apply to other equipment in an installation (Regulation 512.1.5 refers).

A4 Limiting lengths for final circuits

Maximum permitted circuit lengths for some common situations are listed as follows:

Table A2 Radial final circuits supplying lighting

Table A3 Radial final circuits supplying accessories to *BS 1363*

Table A4 Radial final circuits supplying a single load

Table A5 Ring final circuits supplying accessories to *BS 1363*

In all cases, the tabulated data relates to the following conditions

- The installation is supplied from a:
 - TN-S system with a maximum external earth fault loop impedance (Z_e) of 0.8 Ω , or
 - TN-C-S system with a maximum Z_e of 0.35 Ω , or
 - TT system with a residual current device for fault protection. The circuit earth fault loop impedance in ohms is not to exceed the applicable value given in Table 41.5 of *BS 7671*, as required by Regulation 411.4.3.
- Maximum circuit cable lengths given for a TN-C-S system may also be applied to a TT system with RCD protection.
- The consumer unit and the main earthing terminal of the installation are located at the origin of the installation.

- The nominal supply voltage is 230 V single-phase a.c.
- The ambient temperature does not exceed 30 °C.
- 70 °C thermoplastic (pvc) insulated and sheathed flat type cable having copper conductors, conforming to Table 8 of *BS 6004* is used.
- Circuit lengths are measured from the consumer unit to the most distant end of a radial circuit or the total route length for a ring final circuit.
- The maximum circuit cable length has been calculated to satisfy the requirements of *BS 7671* regarding voltage drop limitations and maximum disconnection times.
- In Table A2, a maximum voltage drop of 3 % of the 230 V nominal supply voltage has been allowed in the lighting circuits (Section 525 and Appendix 4 refer). See also Section 10.6 of this Guide.
- In Tables A3, A4 and A5, a maximum of 5 % of the 230 V nominal supply voltage has been allowed in the circuit (Section 525 and Appendix 4 refer). See also Section 10.6 of this Guide.
- Circuit cables are adequately spaced to give a current-carrying capacity (I_z) of at least the rated current (I_n) of the protective device (Regulation 433.1.1 refers). Where the protective device is a *BS 3036* fuse, I_z should be at least I_n divided by the 0.725 factor of Regulation 433.1.202.
- The grouping factors given in Table 4C1 of Appendix 4 in *BS 7671* allow for all the cables in the group to carry their design loads simultaneously and continuously. This is an unlikely event for circuits in household and similar premises, with the exception of cables to water heaters of storage tanks exceeding 15 litres capacity and electric space heating systems.
- With the exception of water heaters of storage tanks exceeding 15 litres and electric space heating, if the following rules are followed, derating for grouping is not necessary
 - 1) Cables are not grouped when installed in or under insulation, that is for installation methods 100, 101, 102, or 103.