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Introduction to the draft for public comment (DPC)

This draft for public comment on BS 7671:2008 is based on IEC/CENELEC standards. The UK's ability to change the requirements is limited, however within that constraint comments are welcome.

All comments must be received by the IET before 28th February 2007 and must be made on the official form which can be found on the IET website at www.theiet.org/DPC or www.bsi-global.com/British_Standards/Getting_involved/DPCs/instructions.xalter.

Copies of the DPC may be obtained from:

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BS 7671: 2008 Requirements for Electrical Installations is to be issued on January 1st 2008 and is intended to come into effect on June 1st 2008. Installations designed after 1st June 2008 are to comply with BS 7671:2008.

BS 7671: 2008 will contain updated text for the following, which are not included in this DPC:

- (i) Foreword
- (ii) Editions
- (iii) Constitution
- (iv) Preface
- (v) Note by the Health and Safety Executive
- (vi) Appendix 1, British Standards to which reference is made in the Regulations
- (vii) Index.

BS 7671: 2008 includes changes necessary to maintain technical alignment with CENELEC harmonization documents. A summary of the main changes are listed below.

Note 1: This is not an exhaustive list.

Note 2: Particular attention is drawn to Section 701. This section now allows socket-outlets (other than SELV and shaver supply units to BS EN 60742) to be installed in locations containing a bath or shower 3m horizontally beyond the boundary of zone 1.

Regulation 131.6 adds requirements to protect against voltage disturbances and implement measures against electromagnetic influences. In doing so, the design shall take into consideration the anticipated electromagnetic emissions, generated by the installation or the installed equipment, which shall be suitable for the current-using equipment used with, or connected to, the installation.

Regulation 132.13 requires that documentation for the electrical installation, including that required by Chapter 51 and Part 6, is provided for every electrical installation.

Chapter 35 adds requirements for safety services, which recognises the need for safety services as they are frequently regulated by statutory authorities whose requirements have to be observed, e.g. emergency escape lighting, fire alarm systems, installations for fire pumps, fire brigade lifts and smoke and heat extraction equipment.

Chapter 36 Continuity of service, requires that an assessment shall be made for each circuit of any need for continuity of service considered necessary during the intended life of the installation.

Chapter 41 Protection against Electric Shock now refers to basic protection, which is protection under normal conditions (previously referred to as protection against direct contact), and fault protection, which is protection under fault conditions (previously referred to as protection against indirect contact). Part 41 now includes those requirements previously given in Section 471 of BS 7671:2001.

Chapter 41 now requires that for the protective measure of automatic disconnection of supply for an a.c. system, additional protection by means of a residual current device with a rated residual operating current ($I_{\Delta n}$) not exceeding 30 mA and an operating time not exceeding 40 ms at a residual current of 5 $I_{\Delta n}$ be provided for socket-outlets with a rated current not exceeding 20 A that are for use by ordinary persons and are intended for general use, and for mobile equipment with a current rating not exceeding 32 A for use outdoors. This additional protection is now to be provided as additional protection in the event of failure of

the provision of basic protection and/or the provision for fault protection or carelessness by users of the installation. Note that certain exceptions are permitted – refer to Regulation 411.3.3.

Chapter 41 includes Tables 41.2, 41.3 and 41.4 for earth fault loop impedances (replacing Tables 41B1, 41B2 and 41D). These new Tables are based on a nominal voltage of 230 V (not 240 V), hence the values are slightly changed (reduced). It has been clarified that where an RCBO is referred to in these Tables, the overcurrent characteristic of the device is being considered.

Chapter 41 includes a new Table 41.5 giving maximum values of earth fault loop impedance for residual current devices to BS EN 61008 and BS EN 61009.

FELV is recognized as a protective measure and the new requirements are detailed in Regulation 411.7.

Chapter 41 includes the UK reduced low voltage system. Requirements are given in Regulation 411.8.

Chapter 42 Protection against thermal effects includes requirements in 422 Precautions where particular risks of fire exist (These requirements were previously stated in Section 482 of BS 7671:2001).

Chapter 43 Protection against overcurrent includes those requirements previously given in Section 471 of BS 7671:2001. Information on the overcurrent protection of conductors in parallel is given in Appendix 10.

Chapter 44 Protection against voltage disturbances, includes a new Section 442, Protection of low voltage installations against temporary overvoltages due to earth faults in the high voltage system and due to faults in the low voltage system. This new section provides for the safety of the low voltage system under fault conditions including faults in the high voltage system, loss of the supply neutral in the low voltage system and short-circuit between a line conductor and neutral in the low voltage installation.

Section 443 Protection against overvoltages of atmospheric origin or due to switching, retains the existing text from BS 7671 and adds Regulations enabling designers to use a risk assessment approach when designing installations which may be susceptible to overvoltages of atmospheric origin.

Chapter 52 Selection and erection of wiring systems now includes busbar trunking systems and powertrack systems. It is now permitted to protect cables concealed in a wall or partition by a 30 mA RCD if the normal methods of protection including use of cables with an earthed metallic covering, mechanical protection or the use of the safe zones cannot be employed. Table 52.2 Cable surrounded by thermal insulation gives slightly modified derating factors, to take account of the availability of material with improved thermal insulation.

Chapter 53 Protection, isolation, switching, control and monitoring. Simplification means that requirements previously in Chapter 46, Sections 476 and 537 of BS 7671:2001 are now in this single Chapter. Chapter 53 also includes a new Section 532 Erection of surge protection devices and a new Section 538 Monitoring devices.

Chapter 54 Regulation 542.2.4 permits the use of metallic water supply (other than supply utility) pipework as an earth electrode if precautions are taken against its removal and it has been considered for such a use.

Regulation 543.4.1 states that In Great Britain, regulation 8(4) of the Electricity Safety, Quality and Continuity Regulations 2002 prohibits the use of PEN conductors in consumers' installations. Where PEN conductors are used as part of a distributor's network, the distributor must comply with regulation 9 of the Electricity Safety, Quality and Continuity Regulations 2002.

Regulation 543.7 has earthing requirements for the installation of equipment having high protective conductor currents. Section 607 of BS 7671:2001 is now deleted and the technical requirements are included in this Regulation group.

Chapter 55 Other equipment, includes new additional requirements in Regulation 551.2 to ensure the safe connection of low voltage generating sets including small-scale embedded generators (SSEGs).

Section 559 Luminaires and lighting installations is a new series of Regulations giving requirements for fixed outdoor lighting installations, outdoor lighting installations, extra-low voltage lighting installations, lighting for display stands and highway power supplies and street furniture (previously in Section 611 of BS 7671:2001).

Chapter 56 Safety services, has been expanded in line with IEC standardization and includes requirements for emergency escape lighting and fire protection applications which include additional requirements for initial verification, testing and reporting and periodic inspection and testing and reporting.

Part 6 was Part 7 of BS 7671:2001. Changes have been made to the requirements for insulation resistance; when testing SELV and PELV circuits at 250 V, the minimum insulation resistance is raised to 0.5 M Ω ; for systems up to and including 500 V, including FELV, the minimum insulation resistance is raised to 1.0 M Ω .

Part 7 was Part 6 of BS 7671:2001. The structure of Part 7 Special installations or locations includes the following changes.

Section 607 in BS 7671:2001 relating to high protective conductor currents has been incorporated into Chapter 54.

Section 608 in BS 7671:2001 relates to caravans, motor caravans and caravan parks has been incorporated into Section 708: Electrical installations in caravan/camping parks and similar locations and Section 721: Electrical installations in caravans and motor caravans.

Section 611 of BS 7671:2001 relating to highway power supplies is now incorporated into Section 559.

The following major changes are incorporated in Part 7:

Section 701 Locations containing a bath tub or shower basin.

Zone 3 is no longer defined.

Each circuit in the special location must have 30 mA RCD protection.

Supplementary bonding is no longer required providing the installation has main bonding in accordance with Chapter 41.

This section now allows socket-outlets (other than SELV and shaver supply units to BS EN 60742) to be installed in locations containing a bath or shower 3m horizontally beyond the boundary of zone 1.

Section 702 Swimming pools and other basins. This special location now includes basins of fountains. Requirements applicable to PME supplies are included. Zones A, B and C in BS 7671:2001 are replaced by zones 0, 1 and 2.

Section 703 Rooms and cabins containing sauna heaters. Zones A, B, C and D in BS 7671:2001 are replaced by zones 1, 2 and 3.

Section 704 Construction and demolition site installations. The reduced disconnection times and the 25 V equation no longer appear.

Section 705 Agricultural and horticultural premises. The reduced disconnection times and the 25 V equation no longer appear. Additional requirements applicable to life support systems are included.

Section 706 Conducting locations with restricted movement, was Section 606 in BS 7671:2001.

Section 708 Electrical installations in caravan/camping parks and similar locations now includes the requirement that each socket-outlet must be provided individually with overcurrent and RCD protection.

The following new Sections are now included in Part 7:

Section 709 Marinas and similar locations

Section 711 Exhibitions, shows and stands

Section 712 Solar photovoltaic (pv) power supply systems

Section 717 Mobile or transportable units

Section 721 Electrical installations in caravans and motor caravans – previously in Section 608 of BS 7671:2001

Section 740 Temporary electrical installations for structures, amusement devices and booths at fairgrounds, amusement parks and circuses

Section 753 Floor and ceiling heating systems.

Appropriate changes have been made to **Appendices 1 to 7**, in particular the methods and tables used in **Appendix 4**.

The following new Appendices are now included:

Appendix 8 Current-carrying capacity and voltage drop for busbar trunking and powertrack systems

Appendix 9 Definitions – other systems

Appendix 10 Protection of conductors in parallel against overcurrent

Appendix 11 Effect of harmonic currents on balanced three-phase systems

Appendix 12 Voltage drop in consumers' installations

Appendix 13 Methods for measuring the insulation resistance/impedance of floors and walls to Earth or to the protective conductor system

Appendix 14 Measurement of fault loop impedance: consideration of the increase of the resistance of the conductors with the increase of temperature

Notes on the plan of the 17th Edition

The edition is based on the plan agreed internationally for the arrangement of safety rules for electrical installations.

The regulation numbering follows the pattern and corresponding references of IEC 60364. The numbering does not, therefore, necessarily follow sequentially. The numbering system used in Part 7 is explained in Section 700.

In the numbering system used, the first digit signifies a Part, the second digit a Chapter, the third digit a Section and the subsequent digits the Regulation number. For example, the Section number 413 is made up as follows:

PART 4 – PROTECTION FOR SAFETY

Chapter 41 (first chapter of Part 4) – PROTECTION AGAINST ELECTRIC SHOCK.

Section 413 (third section of Chapter 41) – PROTECTIVE MEASURE: ELECTRICAL SEPARATION

Part 1 sets out the scope, object and fundamental principles.

Part 2 defines the sense in which certain terms are used throughout the Regulations.

The subjects of the subsequent parts are as indicated below:

Part	Subject
3	Identification of the characteristics of the installation that will need to be taken into account in choosing and applying the requirements of the subsequent Parts. These characteristics may vary from one part of an installation to another and should be assessed for each location to be served by the installation.
4	Description of the basic measures that are available for the protection of persons, property and livestock, and against the hazards that may arise from the use of electricity.
5	Precautions to be taken in the selection and erection of the equipment of the installation.
6	Inspection and testing.
7	Special installations or locations – particular requirements.

The sequence of the plan should be followed in considering the application of any particular requirement of the Regulations. The general index provides a ready reference to particular regulations by subject, but in applying any one regulation the requirements of related regulations should be borne in mind. Cross-references are provided, and the index is arranged to facilitate this.

In many cases, a group of associated regulations is covered by a side heading which is identified by a two-part number, e.g. 547.3. Throughout the Regulations where reference is made to such a two-part number, that reference is to be taken to include all the individual regulation numbers which are covered by that side heading and include that two-part number.