IN THIS ARTICLE we look at the impact that some of the changes expected in BS 7671:2008, the IEE Wiring Regulations (17th Edition), will have on the design, erection and verification of electrical installations. This article is generally based on the Draft for Public Comment and therefore the actual requirements may change.

1. Section 701 Locations containing a bath or shower.

Regulation 701.411.3.3 now requires that additional protection shall be provided for all circuits of the location, by the use of one or more RCDs having the characteristics specified in Regulation 415.1.1. This is a significant change.

Previously, only fixed current using equipment (other than electric showers) located in zone 1 required 30mA RCD protection and current using equipment (other than fixed current using equipment – such as a washing machine, if suitable for use in a bathroom, connected through a fused connection unit) in zone 3 required 30mA RCD protection.

Regulation 701.411.3.3 means that all circuits, including lighting, electric showers, heated towel rails, etc., will require 30mA RCD protection.

Another significant change is introduced by Regulation 701.512.3. This now permits 230v socket outlets to be installed in a room containing a bath or shower providing they are installed 3 m horizontally from the boundary of zone 1. This change resolves the ambiguity that existed between locations containing a bath or shower and a bedroom containing a shower.

Regulation 701.515.2 introduces a further significant change regarding supplementary equipotential bonding. The Regulation states that where the location containing a bath or shower is in a building with a protective equipotential bonding system in accordance with Regulation 411.3.1.2, supplementary equipotential bonding may be omitted where all of the following conditions are met:

(i) All final circuits of the location comply with the requirements for automatic disconnection according to 411.3.2, and
(ii) All final circuits of the location have additional protection by means of an RCD in accordance 701.411.3.3, and
(iii) All extraneous-conductive-parts of the location are effectively connected to the protective equipotential bonding according to 411.3.1.2.

2. Chapter 52 Selection and erection of wiring systems. Cables concealed in a wall or partition.

A new series of regulations has been introduced concerning cables concealed in a wall or partition. These new Regulations introduce the concept of skilled person and instructed person. They also introduce the requirement for RCD protection.

It is now required to protect cables concealed in a wall or partition (at a depth of less than 50mm) by a 30 mA RCD where the installation is not intended to be under the supervision of a skilled or instructed person if the normal methods of protection including use of cables with an earthed metallic covering, earthed conduit/trunking or mechanical protection cannot be employed.

Irrespective of the depth, a cable in a partition where the construction includes metallic parts other than fixings shall be protected by a 30mA RCD.

For example, this means (in a domestic installation) where insulated and sheathed cables are concealed in a wall at a depth of less than 50mm and have no mechanical protection, they need to be installed within the safe zones and need to be protected by a 30mA RCD.
3. Chapter 41 Protection against electric shock.

3.1 socket-outlets

Chapter 41 now requires in Regulation 411.3.3 that for the protective measure of automatic disconnection of supply for an a.c. system, additional protection by means of a 30 mA RCD shall be provided for socket-outlets with a rated current not exceeding 20 A that are for use by ordinary persons. The 17th Edition defines an ordinary person as “a person who is neither a skilled person nor an instructed person”.

An exception is permitted for socket-outlets for use under the supervision of skilled or instructed persons. The 17th Edition defines a skilled person as “a person with technical knowledge or sufficient experience to enable him/her to avoid dangers which electricity may create”. An instructed person is defined as “a person adequately advised or supervised by skilled persons to enable him/her to avoid dangers which electricity may create”. Therefore this exception would apply, for example, in some commercial or industrial locations.

A further exception is permitted for a specific labelled or otherwise suitably identified socket-outlet provided for connection of a particular item of equipment. This, for example, could be a socket outlet for a freezer in a domestic kitchen.

However, the Regulations require that an RCD shall be so selected and the electrical circuits so subdivided that any protective conductor current which may be expected to occur during normal operation of the connected load(s) will be unlikely to cause unnecessary tripping of the device. For example, this could mean the installation of RCBOs instead of Split Load consumer units in a domestic installation.

This requirement is a significant change from the 16th Edition which had fewer requirements for RCD protection, for example, these were:

- supplementary protection in every circuit likely to supply portable equipment for use outdoors, and
- indirect shock protection where the earth fault loop impedance (Ze) is insufficiently low to operate a fuse or circuit-breaker within the prescribed time.

3.2 Disconnection times.

Chapter 41 now requires that final circuits not exceeding 32 A shall have a disconnection time not exceeding 0.4 seconds for a TN system with, for example, a nominal voltage to earth of 230 volts. However, with regard to TT systems, a statement is included with Table 41.1, Maximum disconnection times:-

“Where disconnection is achieved by an overcurrent protective device, and the protective equipotential bonding, or main equipotential bonding, is correctly installed, the maximum disconnection times applicable to a TN system may be used.”

With regard to TN systems, users of the Regulations will note that where the overcurrent protective device is a circuit-breaker, such as a device to BS EN 60898 and the earth fault loop impedance Ze is not greater than the values given in Table 41.3, the circuit will disconnect within 0.4 seconds then the requirements of the 17th Edition of BS 7671 will be met.

This reduction in disconnection time is a significant change from the 16th Edition. The current Edition requires that a circuit supplying socket-outlets, for example, shall have a 0.4 second disconnection time compared to a circuit supplying stationary equipment which must have a disconnection time not exceeding 5 s (413-02-13).

4.0 Voltage drop in consumers’ installations.

Chapter 52 introduces changes in the maximum voltage drop permitted and makes a clear division between the requirements of an installation supplied from a public LV supply and a private LV supply. The first two Regulations require that the voltage at the terminals of
any fixed current-using equipment shall be greater than the lower limit corresponding to the product standard relevant to the equipment or in the absence of a standard shall not to impair the safe functioning of that equipment; this is the same as the 16th Edition requirement.

The new Regulations recognise that the voltage drop requirements will be satisfied if the voltage drop between the origin of the installation (usually the supply terminals) and a socket-outlet or the terminals of fixed current-using equipment does not exceed that stated in Appendix 12.

This Appendix gives a maximum value of 3% for lighting and 5% for other uses for a low voltage installation supplied directly from a public low voltage distribution system. This is the most common situation.

For a low voltage installation, supplied directly from a private LV supply, the appendix gives a maximum value of 6% for lighting and 8% for other uses.

This is a significant change from the 16th Edition which permitted a maximum value of 4% voltage drop, irrespective of whether the installation was supplied from a public or private supply.

5.0 Section 702 - Swimming pools and other basins

Section 702 now includes basins of fountains, zones A, B and C in the 16th Edition are replaced by zones 0, 1 and 2 (however the actual zones remain the same) and a solution is included for the installation of 230 volt luminaires for swimming pools where there is no zone 2 (previously zone c).

The 17th Edition states that for swimming pools where there is no zone 2, lighting equipment supplied by other than a SELV source at 12 V a.c. rms or 30 V ripple-free d.c. may be installed in zone 1 on a wall or on a ceiling provided that the following requirements are fulfilled:

- the height from the floor is at least 2 m above the lower limit of zone 1.

In addition, every luminaire shall have an enclosure providing Class II or equivalent insulation and providing protection against mechanical impact of medium severity.

This is a significant change from the 16th Edition which only allowed SELV luminaires in zones A and B. It is not usually practicable to provide general illumination in a swimming pool by means of SELV luminaires and therefore the solution was to install ordinary luminaires at a height greater than 2.5 m above the floor/access level. However, when refurbishing older, smaller installations, there may be insufficient headroom to install the luminaires outside zone B and it may not be practicable to illuminate an area with 12 volt SELV luminaires. The 17th Edition will provide a solution to this problem.

Section 708 Electrical installations in caravan / camping parks and similar locations - Caravan pitch electrical supply equipment - socket-outlets

Section 708 now requires that each socket-outlet shall be protected individually by a residual current device with a rated residual operating current not exceeding 30 mA. The neutral shall always be disconnected by the residual current device.

This is a significant change from the 16th Edition which required that each socket-outlet must be protected individually by an overcurrent device which may be a fuse but is more usually a circuit-breaker, and either individually or in groups of not more than three socket-outlets by a 30mA RCD.

More information.

Important: this article only considers a small number of the changes expected in the 17th Edition. For more information refer to the IET website, www.theiet.org.