Electrical Contractors’ Association

Presents

BS 7671 2008:
Amendment No 1
BS 7671: 2008 – Amendment No 1, 2011

IEE Wiring Regulations
Now called IET Wiring Regulations
History

- 1882 – first edition of the Wiring Regulations
- Remained as IEE domain until 1981 when they were aligned to some degree with IEC/European Wiring Regulations
- 1992 – Became BS 7671 adopting the harmonised documents (HDs) formalising harmonisation
- 2008 – BS 7671:2008
  Requirements for Electrical Installations
  IEE Wiring Regulations 17th Edition
- Now BS 7671: 2008 Amd 1: 2011
- Applies in UK for most electrical installations up to 1000V ac or 1500 V dc
The Wiring Regulations were first issued in 1882 by the Society of Telegraph Engineers and of Electricians, consisting of four pages and 21 Regulations:

**History of BS 7671**

The Wiring Regulations were first issued in 1882 by the Society of Telegraph Engineers and of Electricians, consisting of four pages and 21 Regulations:

### RULES AND REGULATIONS FOR THE PREVENTION OF FIRE RISKS ARISING FROM ELECTRIC LIGHTING

**N.B.**—The value of frequently testing the wires cannot be too strongly urged. It is an operation, skill in which is easily acquired and applied. The escape of electricity cannot be detected by the sense of smell, as can gas, but it can be detected by apparatus far more certain and delicate. Leakage not only wastes waste, but in the presence of moisture it means destruction of the conductor and its insulating covering, by electric action.

**III. LAMPS.**

18. Arc lamps should always be guarded by proper lamp and, prevent danger from falling incandescent pieces of carbon, and from escaping sparks. Their globes should be protected with wire netting.

19. The lamps, and all parts which are to be handled, should be insulated from the circuit.

**IV. DANGER TO PERSON.**

20. To secure persons from danger inside buildings, it is essential to arrange the conductors and fittings, that no one can be exposed to the shocks of alternating currents exceeding 60 volts, and that there should never be a difference of potential of more than 200 volts between any two points in the same room.

21. If the difference of potential within any house exceeds 200 volts, whether the source of electricity be external or internal, the house should be provided outside with a "switch," so arranged that the supply of electricity can be cut off.

By Order of the Council.

F. H. WEBB, Secretary.
BS 7671:2008 – Amendment No 1, 2011

- First Wiring Regulations 1882
- New Amd 1 BS 7671: 2011
- Both placed importance on isolation
  - Regulation 7 1882 - Chapter 53 BS 7671 Amd 1 2011
- Mechanical Protection and labelling
  - Regulation 17 1882 - Chapters 51 and 52 BS 7671 Amd No 1, 2011
Temp of cables max allowed 150°f (65°C) in 1882
BS 7671:2008 cable normally 70°C

Note: in first regulations it highlights the importance of frequently ‘testing the wires’

This is now known as Periodic Inspection and Testing Chapter 62 BS 7671:2011
European changes

- The reason we have the 1st Amendment is the ongoing European harmonisation work
- CENELEC / EU ongoing work, EU member states required to implement in national standard
- This goes to JPEL/64 UK national committee then into our regs, BS 7671
- Note, proposals were issued for public comment on proposed changes, did you comment?
When is Amendment 1 expected to be introduced?

- Published on 1st July 2011
- From 30th June 2011 up to the 31st Dec 2011 designers have the choice of working to existing standards or the newly implemented Amd 1 but not both e.g. you cannot cherry pick!
- All installations designed after 31st Dec 2011 to comply with:
  BS 7671: 2008 17th Edition Amd 1

Note - this should be recorded on the installation certificate
Authority

- HSE recognises that installations which conform to BS7671: 2008 will be likely to achieve conformity with EAW Regs 1989. In Health and Safety law – GUILTY and the onus is to prove innocence. EAWR 1989 are statutory – they are generic in nature – they state what is required but do not describe in detail how to achieve this.

- BS 7671 17th 2008 Amd 1 standard applies to the Design, Erection and Verification of electrical installations and alterations and additions to existing installations

- Existing installations may have been designed and installed to conform to the standards set by earlier editions of BS 7671 or the IEE (IET) wiring regulations. This does not mean that they will fail to achieve conformity with the relevant part of the Electricity at Work Regulations 1989
Outline

- BS 7671 17th Edition Amd 1 2011 is set out similar to BS 7671 17th Edition 2008
- The Standard is divided into Parts and Chapters with appendices as before.
Outline

There are 7 parts as before:
• Part 1: Scope, Object and Fundamental Principles
• Part 2: Definitions
• Part 3: Assessment of General Characteristics
• Part 4: Protection for Safety
• Part 5: Selection and Erection of Equipment
• Part 6: Inspection and Testing
• Part 7: Special installations or locations, two new areas 710 & 729
• Appendices now numbered 1-16 (was 15)
Changes

• The changes to BS 7671 Amd 1 are significant in the areas that they apply to.

• Fortunately only a limited number of contractors will be affected by these changes as they are for specific or specialised areas of work.
Changes

- **New numbering system introduced for UK-only national regulations**
- In Amd 1 UK national regulations will end in 100, 101, 102, etc.
- Examples:
  - Reg 522.6.7 *now* 522.6.102
  - Reg 433.1.5 *now* 433.1.103

This will show regulations that are specific to the UK only and not used in the EU
Changes

- New definitions introduced into Part 2
- Part 1-7 remain unchanged in title but some have additional content
- Part 7 has two additional sections
Changes

- Appendices now total 16 in number
- New Appendix 16, Devices for protection against overvoltage
- Content from appendix 11 and 12 now moved into appendix 4
- Appendices 11 & 12 now blank for use at a later date
Changes

As before all appendices are informative other than Appendix 1 which is normative.

i.e. Appendix 1 is a requirement and all others are provided for guidance.
Things that have not changed!

There has been a lot of discussion about the draft proposals but some did not make the final copy.

• For example: Minor Works

  Omitting RCD protection for minor work when additional sockets and cables (in fabric of building) are installed from existing circuits when not under the supervision of skilled or instructed persons was not implemented, beware!!!!
Part 2: Some New Definitions

• Definition now given for:
  – Minor Works
  – Medical Location
  – Applied Part (within medical locations)
  – Bonding Network
  – Operating and maintenance gangway
Part 3

- Very few changes which are mainly editorial other than earthing system diagrams moved from Part 2 into Part 3
  - TN-S
  - TN-C-S
  - TT
Part 4

- Changes to tables 41.2 & 41.4 due to new fuse standard being introduced

<table>
<thead>
<tr>
<th>Was</th>
<th>Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>BS 1361</td>
<td>BS 88-3</td>
</tr>
<tr>
<td>BS 88 -2-2</td>
<td>BS 88-2</td>
</tr>
<tr>
<td>BS 88- 2-6</td>
<td>BS 88-2</td>
</tr>
</tbody>
</table>

- What is the effect?
Part 4

- **Effect**
- Changes to some Zs values
- Withdrawal of certain protective device ratings
- Change to some time current tables in Appendices
Section 443: Existing protection against overvoltage of atmospheric origin or due to switching

Some minor changes

- Main change regulation 443.1.1 now highlights Section 534 ref SPDs (Surge Protection Devices)
Part 4

Section 444 is new – Measures against electromagnetic disturbances. Why was this introduced?

- EMC requirements, an EU Directive, was issued in July 2007 which included requirements for fixed installations. Section 444 was introduced to help designers meet this EU Directive
- Designer and installers should undertake risk assessments
- Should you keep evidence in your design file?
Section 444

- The application of Section 444 will depend on the equipment installed in the electrical installation
- There is advice in Annex A444 on Section 444

See **BS EN 50174** Series (Information Technology. Cabling installation) & **BS EN 50310** (earthing & bonding in buildings with information technology equipment) if involved with ICT installations.

ECA guidance on EMC for electrical Installations and cable separation is available
Section 444

- Section 444 requires consideration of equipment potential for generating electromagnetic disturbances and their effect if any on other equipment.

- Potential Sources of electromagnetic disturbances within an installation could be…
Section 444

Other sources include:

- Switching devices for inductive loads
- Electric motors
- Welding machines
- Lifts
- Switch gear
- HV installations
Section 444

If you need EMC advice, please speak to your trade association

The ECA
Part 5

• Part 5 changes are mainly editorial other than new section 534 on:
• Surge Protection Devices (SPDs)!

(More on this later)
Part 5

• Example Regulation 510.2 now 510.3. Regulation numbering has changed but content has not.
Part 5 Changes

- New Reg 521.100 Prefabricated wiring systems to comply with BS 8488
- Reg 522.6.100 A cable installed under a floor or above a ceiling .......... additional item added
- (vi) Ref SELV or PELV protected circuits
Part 5 Changes

• Reg 526.3, Every connection shall be accessible for inspection and testing

(additional item added)

• (vi) Equipment complying with BS 5733 for a maintenance free accessory and marked with the symbol \textbf{MF} and installed in accordance with manufacturer’s instruction

The ECA recommends that you leave a marked up diagram showing location
Part 5 New Section 534

- It was introduced to harmonise with HD 60364-5-53
- Section 534 deals with the installation of surge protection devices (SPDs) where required
- An SPD is a device that is intended to limit transient overvoltages and divert surge currents to protect equipment
Part 5 New Section 534

Why now?

• More electronic and ICT equipment is in use
• More equipment sensitive to ‘spikes’ in use today
• BS EN 62305 (Lightning protection standard) now requires this to be a consideration
• Section 534 needs to be read fully in conjunction with Section 443 and Table 44.3
Part 5 New Section 534

There are 3 types of SPDs recognised:

• Type 1 SPD located @ main switch board
• Type 2 SPD located @ final and sub-boards
• Type 3 SPD located @ items of equipment
Part 5 New Section 534
Part 5

• Regulation 559.6.1.9, A lighting installation shall be appropriately controlled ..................
• Now refers designer and installer to Table 53.4
Part 6 & Appendix 6

Biggest change for most contractors is new Electrical Installation Condition Report including:

• The new Condition Report Inspection Schedule for Domestic and similar premises up to a 100 amp supply
• PIR now EICR
Part 6 & Appendix 6

- New coding – 3 codes, not 4
- We will still carry out Periodic Inspections of electrical installations
When to use a new inspection schedule within Amd No. 1?

• Designed for domestic and similar premises with up to a 100A supply

• What do I use for other than the above?
  – Further advice and guidance will be available from the ECA
Part 6 & Appendix 6

New codes now:
C1 Danger Present
C2 Potentially Dangerous

Note: if one or more genuine C1 or C2 is recorded, this will result in an unsatisfactory condition being recorded

C3 Improvement recommended
Chapter 62: Periodic Inspection & Testing

- Remember regulation 621.5 Periodic Inspection & Testing shall be undertaken by:
  
  a competent person

Proof of competence may be required.
If you do not have the necessary experience or are not confident, then perhaps you are not competent.
Part 6 & Appendix 6

ELECTRICAL INSTALLATION CONDITION REPORT

Section A. Details of the client/person ordering the report

Name: ____________________________
Address: ____________________________

Section B. Reason for producing this report

Amended or after inspection and testing were carried out

Section C. Details of the installation which is the subject of this report

Occupier: ____________________________
Address: ____________________________

Description of premises (not as appropriate)

Crecent: [ ]  Commercial: [ ] Industrial: [ ] Other: [ ] (include brief description)

Installation used for: [ ] Office [ ] Industrial use [ ] Shop [ ] Other: [ ]

Polices of additions/alterations: Yes [ ] No [ ] Last appearance: [ ] Yes, estimates not given [ ] No, estimates given

Insulation research available: Yes [ ] No [ ] Date of report submitted: [ ]

Section D. Extent and limitation of inspection and testing

Scope of the electrical inspection carried out by the report

Agreed: [ ] Extensions including the expansion (see Regulation 642.2)

Agreed with:

Operational limitations including the reason (see page nr. __)

The inspection and testing detailed in this report and accompanying schedules shall be carried out in accordance with IS 8071: 1996 [12]

A wiring Regulations as amended is [ ]

It is to be noted that during completion within buildings and outdoors, under floors, in roof spaces, and generally within the fabric of the building or underground, has not been inspected unless specifically agreed between the client and inspector prior to the inspection.

Section E. Summary of the condition of the installation

General condition of the installation (in terms of electrical safety)

Overall assessment of the installation in terms of suitability for continued use

SATISFACTORY / UNSATISFACTORY [ ] (as appropriate)

Section F. Recommendations

If the overall assessment of the suitability of the installation for continued use above is stated as UNSATISFACTORY, the installer is recommended to report to the owner of the premises as follows:

Subsequently to the necessary remedial actions being taken, it is recommended that the installation is further inspected and tested by ____________________________

Section G. Declaration

If the electrical installation is satisfactory, the installer is responsible for the inspection and testing of the electrical installation (as indicated by the signatures below). Particulars of which are described above. Having carried out the inspection and testing, hereby declare that the installation is in accordance with the requirements of the relevant electrical safety and protection regulations.

Date ____________________________

Section A. Acknowledgments

Signature of Inspectors: ____________________________

Date ____________________________

Signature of Person(s) responsible for the inspection and testing: ____________________________

Date ____________________________

The signed copy is part of this document and this report is valid only when they are attached.
Part 6 & Appendix 6
# GENERIC SCHEDULE OF TEST RESULTS

<table>
<thead>
<tr>
<th>Circuit number</th>
<th>Circuit Description</th>
<th>Overcurrent device</th>
<th>Conductor details</th>
<th>Ring final circuit continuity (Ω)</th>
<th>Continuity (Ω) ((R_L + R_0)) or (R_2)</th>
<th>Insulation Resistance (MΩ)</th>
<th>Polarity</th>
<th>(Z_0) (Ω)</th>
<th>RCD (ms)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Where there are no spurs connected to a ring circuit this value is also the \((R_L + R_0)\) of the circuit.*
Part 7

There are two new Special Locations:

- 710 – Medical Locations and
- 729 – Operating and Maintenance Gangways
710 – Medical Locations

Applies to:
• Hospitals
• Private clinics
• Healthcare Centres
• Massage room
• See Section 710 for full list
710 – Medical Locations

Locations segregated into groups depending on procedure undertaken:

- **Group 0**
  No applied parts

- **Group 1**
  Failure of supply – no threat to safety

- **Group 2**
  Applied parts may be used
729 – Operating and Maintenance Gangways

• **Definition:** Operating and Maintenance Gangways

• Gangway providing access to facilitate operations such as switching, controlling, setting, observation and maintenance of electrical equipment.

• For designers and installers this section gives information on distance, width, height between equipment and/or building structure or building fabric.
729 - Operating and Maintenance Gangways

Restricted access areas where basic protection is provided by barriers or enclosures

Where basic protection is provided by barriers or enclosures in accordance with Chapter 41, the following minimum dimensions apply:

<table>
<thead>
<tr>
<th>Description</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gangway width including between: Barriers or enclosures and switch handles</td>
<td>700 mm</td>
</tr>
<tr>
<td>or circuit-breakers in the most onerous position, and Barriers or enclosures</td>
<td></td>
</tr>
<tr>
<td>or switch handles or circuit-breakers in the most onerous position and the</td>
<td></td>
</tr>
<tr>
<td>wall</td>
<td></td>
</tr>
<tr>
<td>Gangway width between barriers or enclosures or other barriers or enclosures</td>
<td>700 mm</td>
</tr>
<tr>
<td>and the wall</td>
<td></td>
</tr>
<tr>
<td>Height of gangway to barrier or enclosure above floor</td>
<td>2000 mm</td>
</tr>
<tr>
<td>Live parts placed out of reach, as Regulation 417.3</td>
<td>2500 mm</td>
</tr>
</tbody>
</table>

Note: Where additional workspace is needed, e.g. for special switchgear and controlgear assemblies, larger dimensions may be required.
New Appendix 16

- Informative
- Gives information in ref to SPDs, their installation and connection (ref Section 534)
Training available from the ECA:

- Full BS 7671 training course
- 1 day BS 7671 update course
- Online full BS 7671 training course
- Online 1st amendment update
  (Note: no exam for the 1st amendment update)
The End

Thank you
Any questions?