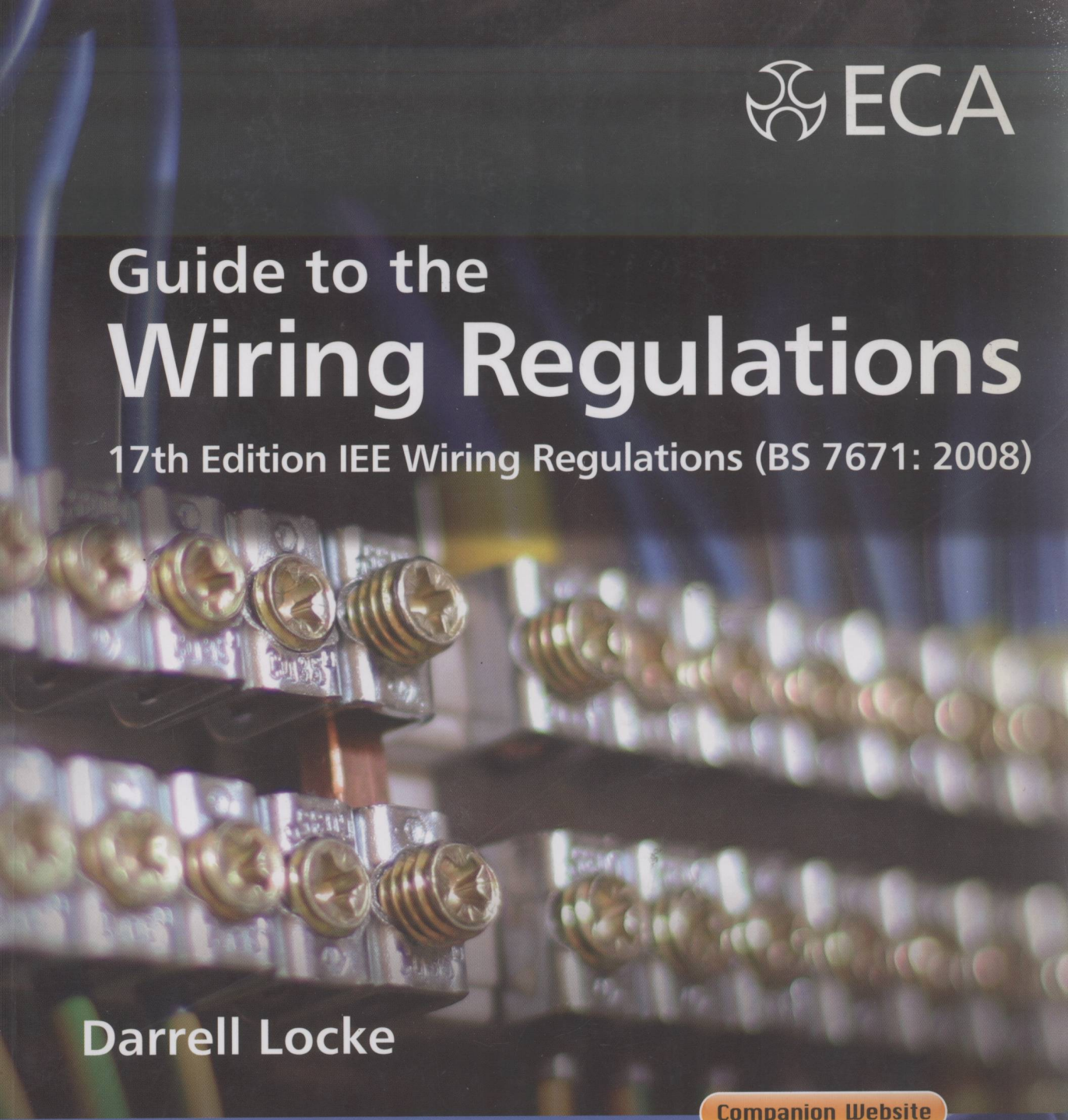

ECA

Guide to the Wiring Regulations

17th Edition IEE Wiring Regulations (BS 7671: 2008)

Darrell Locke

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Guide to the Wiring Regulations

Representing the best in electrical
engineering and building services

Foreword by Giuliano Digilio

Head of Technical Services, Electrical Contractors' Association (ECA)

The IEE Wiring Regulations and more lately BS 7671 have always been important for electrical contractors and for installation designers, and they are a key factor in the implementation of electrical safety within the UK and indeed overseas. The IEE Wiring Regulations go back to the end of the 19th century, almost to the time of the very first electrical installation within the UK.

The ECA is fully committed to the development of standards for the national BS 7671 committee as well as corresponding work in both the European Committee for Electrotechnical Standardisation (CENELEC) and the International Electrotechnical Commission (IEC). This includes a considerable amount of work in the preparation for BS7671: 2008.

I am pleased that you have purchased the ECA *Guide to the Wiring Regulations* and I trust that this quality publication will aid to enhance the understanding and knowledge within the electrical industry for both electrical contractors and electrical designers.

Preface

This book discusses the requirements of BS 7671: 2008, also known as the IEE Wiring Regulations 17th Edition, published during January 2008.

The aim of the guide is to provide an explanation of the theory and reasons behind the Regulations, their meaning and the intent of their drafting. The book provides advice and guidance, demystifying the 'requirements' wherever possible. Practical and original solutions have been provided, which are often not found in other industry guidance.

The guide is a valuable resource for all users of BS 7671 including apprentices, electricians who perhaps want to 'dig a bit deeper' into the background of the Regulations, together with electrical technicians, installation engineers and design engineers. Most individuals who have any involvement with BS 7671 will find the book of considerable help and benefit in their everyday work.

To derive use and benefit from the book it is assumed that readers have knowledge of electrical installation engineering to a basic level. However, 'defined scope' installers and those at similar levels will also gain from working through the book thanks to its clear diagrams. Given these prerequisites, the book can be used as a learning text for the 17th Edition Wiring Regulations as long as readers have a copy of the Standard itself. Indeed, a copy of BS 7671: 2008 is required as a reference document when using this book, and readers should at least familiarize themselves with the terminology and definitions used in the basic Standard.

Guide to the Wiring Regulations is intended to be read on a chapter-by-chapter basis by those involved at the level of designing and constructing installations. This is something that is not easy to achieve with books on this subject as accessing the basic Standard itself can be quite daunting and heavy going.

A particular emphasis or expansion has been made to those subjects that are often confused by readers of BS 7671. In this respect the text does not wander off to discuss ancillary subjects; the text stays focused on providing an understanding of those concepts demanded of BS 7671 so that design and installation decisions can be made by readers.

The book's coverage is comprehensive, and all Parts of the Regulations have been addressed within the topic lead chapters. Design aspects have been included as they are integral to installations. Often, individuals or organizations consider themselves to be either pure designers or pure installers. However, even by the act of an 'installer' in selecting equipment that was unspecified by the designer, e.g. selecting cables or other equipment, an element of design is being carried out. The same concept is true of domestic installers who select 'standard designs' but perhaps feel that they do not design. These individuals are considered to be designers even where the design is not calculated for each installation. The adoption of a 'standard design' or a 'standard cable size' by the installer is in fact design by the installer.

The book is arranged into topic lead chapters, at the heart of which are Chapters C (Circuitry) and D (Selection and Erection of Equipment). Although the titles of these chapters seem simple enough, they are comprehensive and encompass about 70% of the Regulations.

Most requirements of the Regulations have been condensed and summarized using tables aided by clear, simple diagrams. Some tables seem quite long but they are still very condensed compared with the regulations that they summarize. As an example, the new Section 559 in BS 7671 includes 44 regulations, but these are summarized in a 15-row table. The nature of the Regulations is that they must state all facts. However, the repetition of the most basic information in the guide was not considered beneficial; for example, where the regulation is written in the following style:

'cables shall be large enough for the anticipated current'

This type of regulation is either not expanded upon in the guide or it is explained as follows:

'cables shall be 6 mm^2 minimum'.

The book includes five printed appendices and further appendices are available as downloads from the companion website. Appendices that have been included on the Companion Website were either considered to be non-essential for most readers,

or were items that may be subject to change at a future date. The Companion Website can be found at: http://www.wiley.com/go/eca_wiringregulations

Although more experienced readers may wish to jump to Chapter C, the introductory Chapters A and B are worth spending some time on. Within these chapters, the legal standing of BS 7671: 2008 is discussed together with its relationship with key UK law in the area of electrical installations. The general requirements of BS 7671: 2008 are also summarized within these chapters.

Acknowledgements

I would like to thank my wife Julie and my children for their patience, particularly throughout 2007, when much of the drafting of this book took place.

I also give particular thanks to Paul Cook, former staff member of IET, for his assistance with the Circuitry and Earthing and Bonding chapters, and to Leon Markwell, also former IET staff member, for his help with the Special Locations chapter.

I also thank James O'Neil, Director of Engineering of NG Bailey Limited, and Phil MacDonald, Principal Project Electrical Design Engineer of Shepherd Engineering Services, for acting as general readers, and Ken Morton, HM Principal Electrical Inspector, Health & Safety Executive, for his comments on Chapter B.

With thanks to David Thompson for the book design concept and for his creation of the illustrations.

Finally, I also wish to thank Simone Taylor, Nicky Skinner and their colleagues at the Wiley office, Chichester.

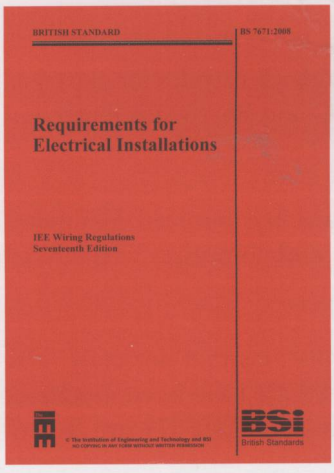
Darrell Locke, October 2007

Contents

BS 7671: 2008 – Introduction and Overview

A 1 Introduction to BS 7671: 2008

BS 7671: 2008 was published during January 2008 as a significant new Edition of this fundamental Standard.



Although the document is a British Standard, it is also known as (and jointly labelled as) the *IEE Wiring Regulations 17th Edition*; this is for copyright reasons. In spite of the fact that the IEE changed to the IET in 2006, the IET has maintained the brand of IEE, mainly for use in its Wiring Regulations documents and products. Indeed, the IEE logo appears on the front cover and the IET logo inside the front cover.

Throughout this book, BS 7671: 2008 is referred to as BS 7671: 2008, or variously as BS 7671, the Wiring Regulations, the Regulations, the 17th edition or the Standard, depending upon the particular context.

In essence, BS 7671: 2008 is virtually a European document. In fact, two parent documents as parts of the corresponding IEC standard have been used or adapted.

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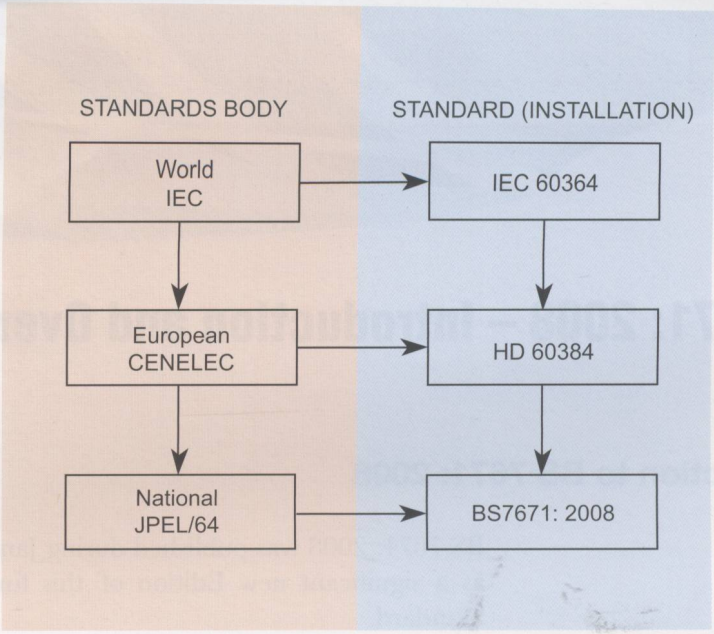

Figure A 1.1 Installation standards at world, European and national levels.

Both IEC and CENELEC have 'wiring regulation' standards or rules for electrical installations. The general structure of IEC, CENELEC and BS 7671 is illustrated in Figure A 1.1.

Many parts of the document originate in CENELEC in a 'harmonized document' (HD). The parent document is known as HD 60384 and comprises virtually all parts of the installation standard.

Within BS 7671: 2008 there are now only a few regulations that are truly 'UK only', although some of the CENELEC parts of HD 60384 have been modified, cut or expanded for BS 7671. Some of the appendices of BS 7671 are home-grown.

The Wiring Regulations committee has also used certain parts of the corresponding IEC document (IEC 60364) modified or virtually unmodified.

A list of the parts of the corresponding CENELEC parts of HD 60384 used in BS 7671: 2008 is shown in Table A 1.1.