



NEGARA BRUNEI DARUSSALAM

**BRUNEI DARUSSALAM STANDARD  
PIAWAI BRUNEI DARUSSALAM**

**PBD IEC 60364-5-54:2002  
IEC 60364-5-54:2002  
Edition 2.0**

**ELECTRICAL INSTALLATIONS OF BUILDINGS -  
PART 5-54: SELECTION AND ERECTION OF ELECTRICAL  
EQUIPMENT - EARTHING ARRANGEMENTS, PROTECTIVE  
CONDUCTORS AND PROTECTIVE BONDING CONDUCTORS**

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**ENERGY DIVISION, PRIME MINISTER'S OFFICE  
IN COLLABORATION WITH MINISTRY OF DEVELOPMENT  
NEGARA BRUNEI DARUSSALAM**

## **FOREWORD**

This Brunei Darussalam Electrical Standard was prepared by the Technical Committee on Electrical Standards (TECO), Energy Division at Prime Minister's Office in collaboration with the Authority for Building and Construction Industry (ABCi), Ministry of Development, Brunei Darussalam with the objective of developing the National Electrical Standards for electrical products, systems, equipments and facilities for the local industry and consumers with reference to international standards, guidelines and procedures. In developing the national electrical standards, the aim is to promote quality, technical integrity, health, safety and environmental standards for the local industries and consumers.

This Brunei Darussalam Electrical Standard is an adoption of the International Electro Technical Commission IEC 60364-5-54: 2002 (Edition 2) standard and implements it as the Brunei Darussalam National Standard.

Attention is drawn to the fact that this Brunei Darussalam Electrical Standard does not confer any immunity from legal obligations in any contract for compliance to the Standard.

The National Electrical Standards are subject to periodical review according to the current needs of the local industries and consumers to keep abreast of progress in the industries and consumers concerned. Suggestions of amendments will be recorded and in due course brought to the notice of the committees concerned.

## **COMMITTEE MEMBERS**

The Technical Committee on Electrical Standards (TECO) was tasked by the Energy Division at the Prime Minister's Office in collaboration with the Authority for Building and Construction Industry (ABCI), Ministry of Development, Brunei Darussalam for the preparation of this Brunei Darussalam Electrical Standard. The members of the Technical Committee are as follows:

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| 1. Awg Haji Abd Shawal Yaman<br>(Chairman)        | Energy Division, Prime Minister's Office  |
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| 5. Awg Simon K A Leong<br>(Assistant Secretary 2) | KR Kamarulzaman & Associates  |
| 6. Awg Haji Md Azrul Azrin Hj Md Zain             | Energy Division, Prime Minister's Office  |
| 7. Awg Md Amir Sharifuddin Haji Ali               | Department of Electrical Services, PMO  |
| 8. Awg Khairul Ezam Hj Mohd Zain                  | ABCI, Ministry of Development   |
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## **SUB-COMMITTEE NO. 5 MEMBERS**

The Sub-Committee No. 5 (SC5) is the working groups for the Electrical Wiring Code of Practice who assisted in the preparation for the adoption of the Brunei Darussalam Electrical Standard. The members of the Sub-Committee No. 5 are :

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PIAWAI BRUNEI DARUSSALAM – BRUNEI DARUSSALAM STANDARD

# INTERNATIONAL STANDARD

BASIC SAFETY PUBLICATION

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**Electrical installations of buildings –  
Part 5-54: Selection and erection of electrical equipment – Earthing  
arrangements, protective conductors and protective bonding conductors**

IEC 60364-5-54:2002

**PBD IEC 60364-5-54: 2010 (Published by IEC in 2002)**  
This IEC International Standard has been adopted by CPRU, Ministry of Development,  
Negara Brunei Darussalam as a national standard under the IEC Affiliate Country Programme

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
541 General.....	6
541.1 Scope .....	6
541.2 Normative references .....	6
541.3 Definitions .....	7
542 Earthing arrangements.....	8
542.1 General requirements.....	8
542.2 Earth electrodes .....	8
542.3 Earthing conductors .....	10
542.4 Main earthing terminal.....	11
543 Protective conductors.....	11
543.1 Minimum cross-sectional areas.....	11
543.2 Types of protective conductors .....	13
543.3 Electrical continuity of protective conductors.....	14
543.4 PEN conductors .....	14
543.6 Arrangement of protective conductors.....	15
543.7 Reinforced protective conductors for protective conductor currents exceeding 10 mA.....	15
544 Protective bonding conductors (equipotential bonding conductors).....	15
544.1 Protective bonding conductors for the connection to the main earthing terminal.....	15
544.2 Protective bonding conductors for supplementary bonding .....	15
 Annex A (normative) Method for deriving the factor $k$ in 543.1.2 (see also IEC 60724 and IEC 60949).....	16
Annex B (informative) Illustration of earthing arrangements, protective conductors and protective bonding conductors .....	19
 Bibliography .....	21
 Table 54.1 – Minimum size requirements for earth electrodes of commonly used material from the point of view of corrosion and mechanical strength where embedded in the soil for commonly used material.....	9
Table 54.2 – Minimum cross-sectional areas of earthing conductors buried in the soil.....	10
Table 54.3 – Minimum cross-sectional area of protective conductors .....	12
Table A.54.1 – Value of the parameters for different materials .....	16
Table A.54.2 – Values of $k$ for insulated protective conductors not incorporated in cables, and not bunched with other cables .....	17
Table A.54.3 – Values of $k$ for bare protective conductors in contact with cable covering but not bunched with other cables .....	17
Table A.54.4 – Values of $k$ for protective conductors as a core incorporated in a cable, or bunched with other cables or insulated conductors .....	17
Table A.54.5 – Values of $k$ for protective conductors as a metallic layer of a cable e.g. armour, metallic sheath, concentric conductor, etc.....	18
Table A.54.6 – Value of $k$ for bare conductors where there is no risk of damage to any neighbouring material by the temperature indicated .....	18

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL INSTALLATIONS OF BUILDINGS –**

**Part 5-54: Selection and erection of electrical equipment –  
Earthing arrangements, protective conductors  
and protective bonding conductors**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60364-5-54 has been prepared by IEC technical committee 64, Electrical installations and protection against electric shock.

This second edition replaces the first edition, published in 1980, its amendment 1 (1982), as well as some clauses of IEC 60364-5-548, published in 1996, and its amendment (1998), and constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
64/1231/FDIS	64/1249/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

It has the status of a basic safety publication in accordance with IEC Guide 104.

This publication has been drafted, as close as possible, in accordance with the ISO/IEC Directives, Part 3.

Annex A forms an integral part of this standard.

Annex B is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2007. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

## INTRODUCTION

Clause numbering is sequential, preceded by the number of this part (e.g. 541). Numbering of figures and tables takes the number of this part followed by a sequential number, i.e. Table 54.1, 54.2, etc. Numbering of figures and tables in annexes takes the letter of the annex, followed by the number of the part, followed by a sequential number, e.g. A.54.1, A.54.2, etc.

**ELECTRICAL INSTALLATIONS OF BUILDINGS –****Part 5-54: Selection and erection of electrical equipment –  
Earthing arrangements, protective conductors  
and protective bonding conductors****541 General****541.1 Scope**

This part of IEC 60364 addresses the earthing arrangements, protective conductors and protective bonding conductors in order to satisfy the safety of the electrical installation.

**541.2 Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050(195), *International Electrotechnical Vocabulary (IEV) – Part 195: Earthing and protection against electric shock*

IEC 60287-1-1, *Electric cables – Calculation of the current rating – Part 1-1: Current rating equations (100 % load factor) and calculation of losses – General*

IEC 60364-4-41, *Electrical installations of buildings – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-43, *Electrical installations of buildings – Part 4-43: Protection for safety – Protection against overcurrent*

IEC 60364-4-44, *Electrical installations of buildings – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-5-52, *Electrical installations of buildings – Part 5-52: Selection and erection of electrical equipment – Wiring systems*

IEC 60724, *Short-circuit temperature limits of electric cables with rated voltages of 1 kV ( $U_m = 1,2$  kV) and 3 kV ( $U_m = 3,6$  kV)*

IEC 60853-2, *Calculation of the cyclic and emergency current rating of cables – Part 2: Cyclic rating of cables greater than 18/30 (36) kV and emergency ratings for cables of all voltages*

IEC 60909-0, *Short-circuit currents in three-phase a.c. systems – Part 0: Calculation of currents*

IEC 60949, *Calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating effects*