IEC 60364-5-54

Edition 3.0 2011-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

Low-voltage electrical installations –
Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Installations électriques basse-tension –
Partie 5-54: Choix et mise en œuvre des matériels électriques – Installations de mise à la terre et conducteurs de protection

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-

THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2011 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.
If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.
Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: www.iec.ch/searchpub

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: www.iec.ch/online_news/justpub

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

- Electropedia: www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: www.iec.ch/webstore/custserv

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:
Email: csc@iec.ch
Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e3883d48ac40/iec-60364-5-54-2011

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

- Catalogue des publications de la CEI: www.iec.ch/searchpub/cur_fut-f.htm

Le Catalogue en-ligne de la CEI vous permet d'effectuer des recherches en utilisant différents critères (numéro de référence, texte, comité d'études,…). Il donne aussi des informations sur les projets et les publications retirées ou remplacées.

- Just Published CEI: www.iec.ch/online_news/justpub

Restez informé sur les nouvelles publications de la CEI. Just Published détaille deux fois par mois les nouvelles publications parues. Disponible en-ligne et aussi par email.

- Electropedia: www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International en ligne.

- Service Clients: www.iec.ch/webstore/custserv/custserv_entry-f.htm

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions, visitez le FAQ du Service clients ou contactez-nous:
Email: csc@iec.ch
Tél.: +41 22 919 02 11
Fax: +41 22 919 03 00

IEC 60364-5-54

Edition 3.0 2011-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-[illegible]

Installations électriques basse-tension – Partie 5-54: Choix et mise en œuvre des matériels électriques – Installations de mise à la terre et conducteurs de protection

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX

X

ICS 29.020; 91.140.50

ISBN 978-2-88912-400-8

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

CONTENTS

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ac4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

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

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-a9881d48ac40/iec-60364-5-54-2011

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

This third edition cancels and replaces the second edition, published in 2002, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

– clarification of the definition of protective conductor;
– improved specification of mechanical characteristics of the earth electrode;
– introduction of earth electrode for protection against electric shock and lighting protection;
– annexes describing concrete-embedded foundation earth electrodes and soil-embedded earth electrode.

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

FDIS	Report on voting
64/1755/FDIS	64/1766/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 in accordance with the ISO/IEC Directives, Part 2.

The reader's attention is drawn to the fact that Annex E lists all of the "in-some-country" clauses on differing practices of a less permanent nature relating to the subject of this standard.

A list of all parts in the IEC 60364 series, under the general title: *Low-voltage electrical installations*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

INTRODUCTION

Clause numbering is sequential, preceded by the number of this Part. 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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

LOW-VOLTAGE ELECTRICAL INSTALLATIONS –

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

541 General

541.1 Scope

This part of IEC 60364 addresses the earthing arrangements and protective conductors including 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 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

IEC 60364-4-44:2007, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-5-51:2005, *Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules*

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

IEC 60439-2, *Low-voltage switchgear and controlgear assemblies – Part 2: Particular requirements for busbar trunking systems (busways)*

IEC 61439-1, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

IEC 61439-2, *Low-voltage switchgear and controlgear assemblies – Part 2: Power switchgear and controlgear assemblies*

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 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*

IEC 61140:2001, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61534-1, *Powertrack systems – Part 1: General requirements*

IEC 62305 (all parts) *Protection against lightning*

IEC 62305-3:2006, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

541.3 Terms and definitions

For the purposes of this document, the terms and definitions of IEC 61140, together with the following definitions, apply.

Definitions used for earthing arrangements, protective conductors and protective bonding conductors are illustrated in Annex B and listed below:

541.3.1
exposed-conductive-part
conductive part of equipment which can be touched and which is not normally live, but which can become live when basic insulation fails

[IEC 60050-826:2004, 826-12-10]

541.3.2
extraneous-conductive-part
conductive part not forming part of the electrical installation and liable to introduce an electric potential, generally the electric potential of a local earth

[IEC 60050-825:2004, IEV 826-12-11]

541.3.3
earth electrode
conductive part, which may be embedded in the soil or in a specific conductive medium, e.g. concrete, in electrical contact with Earth

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 60050-826:2004, 826-13-05, modified]

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48acd0/iec-60364-5-54-2011

541.3.4
concrete-embedded foundation earth electrode
earth electrode embedded in concrete of a building foundation, generally in the form of a closed loop

[IEC 60050-826:2004, 826-13-08, modified]

541.3.5
soil-embedded foundation earth electrode
earth electrode buried in the soil under a building foundation, generally in the form of a closed loop

[IEC 60050-826:2004, 826-13-08, modified]

541.3.6
protective conductor
conductor provided for purposes of safety, for example protection against electric shock

[IEC 60050-826:2004, 826-13-22]

NOTE Examples of a protective conductor include a protective bonding conductor, a protective earthing conductor and an earthing conductor when used for protection against electric shock.

541.3.7
protective bonding conductor
protective conductor provided for protective-equipotential-bonding

[IEC 60050-826:2004, 826-13-24]

541.3.8
earthing conductor
conductor which provides a conductive path, or part of the conductive path, between a given point in a system or in an installation or in equipment and an earth-electrode network

[IEC 60050-826:2004, 826-13-12]

NOTE For the purposes of this part of IEC 60364, an earthing conductor is the conductor which connects the earth electrode to a point in the equipotential bonding system, usually the main earthing terminal.

541.3.9
main earthing terminal
main earthing busbar
terminal or busbar which is part of the earthing arrangement of an installation and enabling the electrical connection of a number of conductors for earthing purposes

[IEC 60050-826:2004, 826-13-15]

541.3.10
protective earthing conductor
protective conductor provided for protective earthing

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[IEC 60050-826:2004, 826-13-23]

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

541.3.11
functional earthing
earthing a point or points in a system or in an installation or in equipment, for purposes other than electrical safety

[IEC 60050-826:2004, IEV 826-13-10]

541.3.12
earthing arrangement
all the electrical connections and devices involved in the earthing of a system, installation or an equipment

[IEC 60050-195:2004, 195-02-20]

542 Earthing arrangements

542.1 General requirements

542.1.1 The earthing arrangements may be used jointly or separately for protective and functional purposes according to the requirements of the electrical installation. The requirements for protective purposes shall always take precedence.

542.1.2 Where provided, earth electrodes within an installation shall be connected to the main earthing terminal using an earthing conductor.

NOTE An installation does not need to have its own earth electrode.

542.1.3 Where the supply to an installation is at high voltage, requirements concerning the earthing arrangements of the high voltage supply and of the low-voltage installation shall also comply with Clause 442 of IEC 60364-4-44:2007.

542.1.4 The requirements for earthing arrangements are intended to provide a connection to earth which:

– is reliable and suitable for the protective requirements of the installation;
– can carry earth fault currents and protective conductor currents to earth without danger from thermal, thermo-mechanical and electromechanical stresses and from electric shock arising from these currents;
– if relevant, is also suitable for functional requirements;
– is suitable for the foreseeable external influences (see IEC 60364-5-51), e.g. mechanical stresses and corrosion.

542.1.5 Consideration shall be given to the earthing arrangements where currents with high frequencies are expected to flow (see Clause 444 of IEC 60364-4-44:2007).

542.1.6 Protection against electric shock, as stated in IEC 60364-4-41, shall not be adversely affected by any foreseeable change of the earth electrode resistance (e.g. due to corrosion, drying or freezing).

542.2 Earth electrodes

iTeh STANDARD PREVIEW

542.2.1 The type, materials and dimensions of earth electrodes shall be selected to withstand corrosion and to have adequate mechanical strength for the intended lifetime.

(standards.iteh.ai)

NOTE 1 For corrosion, the following parameters may be considered: the soil pH at the site, soil resistivity, soil moisture, stray and leakage a.c. and d.c. current, chemical contamination, and proximity of dissimilar materials.

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-
e56683d48ae40/iec-60364-5-54-2011

For materials commonly used for earth electrodes, the minimum sizes, from the point of view of corrosion and mechanical strength, when embedded in the soil or in concrete, shall be as specified in Table 54.1.

NOTE 2 The minimum thickness of protective coating is greater for vertical earth electrodes than for horizontal earth electrodes because of their greater exposure to mechanical stresses while being embedded.

If a lightning protection system is required, 5.4 of IEC 62305-3:2006 applies.

Table 54.1 – Minimum size of commonly used earth electrodes, embedded in soil or concrete used to prevent corrosion and provide mechanical strength

Material and surface	Shape	Diameter mm	Cross-sectional area mm^2	Thickness mm	Weight of coating g/m^2	Thickness of coating/ sheathing µm
Steel embedded in concrete (bare, hot galvanized or stainless)	Round wire	10				
	Solid tape or strip		75	3		
Steel hot-dip galvanized[c]	Strip[b] or shaped strip/plate – Solid plate – Lattice plate		90	3	500	63
	Round rod installed vertically	16			350	45
	Round wire installed horizontally	10			350	45
	Pipe	25		2	350	45
	Stranded (embedded in concrete)		70			
	Cross profile installed vertically		(290)	3		
Steel copper-sheathed	Round rod installed vertically	(15)				2 000
Steel with electro-deposited copper coating	Round rod installed vertically	14				250[e]
	Round wire installed horizontally	(8)				70
	Strip installed horizontally		90	3		70
Stainless steel[a]	Strip[b] or shaped strip/plate		90	3		
	Round rod installed vertically	16				
	Round wire installed horizontally	10				
	Pipe	25		2		
Copper	Strip		50	2		
	Round wire installed horizontally		(25)[d] 50			
	Solid round rod installed vertically	(12) 15				
	Stranded wire	1,7 for individual strands of wire	(25)[d] 50			
	Pipe	20		2		
	Solid plate			(1,5) 2		
	Lattice plate			2		

NOTE Values in brackets are applicable for protection against electric shock only, while values not in brackets are applicable for lightning protection and for protection against electric shock.

[a] Chromium ≥16 %, Nickel ≥5 %, Molybdenum ≥2 %, Carbon ≤0,08 %.

[b] As rolled strip or slit strip with rounded edges.

[c] The coating shall be smooth, continuous and free from flux stains.

[d] Where experience shows that the risk of corrosion and mechanical damage is extremely low, 16 mm² can be used.

[e] This thickness is provided to withstand mechanical damage of copper coating during the installation process. It may

iTeh STANDARD PREVIEW
(standards.iteh.ai)
IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ba4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

be reduced to not less than 100 μm where special precautions to avoid mechanical damage of copper during the installation process (e.g. drilled holes or special protective tips) are taken according to the manufacturer's instructions.

542.2.2 The efficacy of any earth electrode depends on its configuration and upon local soil conditions. One or more earth electrodes suitable for the soil conditions and the value of resistance to earth required shall be selected.

Annex D gives methods of estimation of earth electrode resistance.

542.2.3 The following are examples of earth electrodes which may be used:

– concrete-embedded foundation earth electrode;

NOTE For more information see Annex C.

– soil-embedded foundation earth electrode;
– metallic electrode embedded directly in soil vertically or horizontally (e.g. rods, wires, tapes, pipes or plates);
– metal sheath and other metal coverings of cables according to local conditions or requirements;
– other suitable underground metalwork (e.g. pipes) according to local conditions or requirements;
– welded metal reinforcement of concrete (except pre-stressed concrete) embedded in the earth.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

542.2.4 When selecting the type and embedded depth of an earth electrode, consideration shall be given to possible mechanical damage and to local conditions to minimize the effect of soil drying and freezing.

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

542.2.5 Consideration shall be given to electrolytic corrosion when using different materials in an earthing arrangement. For external conductors (e.g. earthing conductor) connected to a concrete-embedded foundation earth electrode, the connection made from hot-dip galvanized steel shall not be embedded in the soil.

542.2.6 The earthing arrangement shall not rely on a metallic pipe for flammable liquids or gases as the earth electrode and their buried length shall not be considered when dimensioning the earth electrode.

NOTE This requirement does not preclude the protective equipotential bonding via the main earthing terminal (541.3.9) of such pipes for compliance with IEC 60364-4-41.

Where cathodic protection is applied and the exposed-conductive-part of an item of electrical equipment supplied by a TT system is directly connected to the pipe, a metallic pipe for flammable liquids or gases may act as the sole earth electrode for this specific equipment.

542.2.7 Earth electrodes shall not be directly immersed in water of a stream, river, pond, lake or the like (see also 542.1.6).

542.2.8 Where an earth electrode consists of parts that must be connected together, the connection shall be by exothermic welding, pressure connectors, clamps or other suitable mechanical connectors.

NOTE Connections made by a wrapped iron wire only are not suitable for protection purposes.

542.3 Earthing conductors

542.3.1 Earthing conductors shall comply with 543.1.1 or 543.1.2. Their cross-sectional area shall be not less than 6 mm^2 for copper or 50 mm^2 for steel. Where a bare earthing conductor

is buried in the soil, its dimensions and characteristics shall also be in accordance with Table 54.1.

Where no noticeable fault current is expected to flow through the earth electrode (e.g. in TN systems or IT systems), the earthing conductor may be dimensioned according to 544.1.

Aluminium conductors shall not be used as earthing conductors.

NOTE Where a lightning protection system is connected to the earth electrode, the cross-sectional area of the earthing conductor should be at least 16 mm² for copper (Cu) or 50 mm² for iron (Fe) (see the IEC 62305 series).

542.3.2 The connection of an earthing conductor to an earth electrode shall be soundly made and electrically satisfactory. The connection shall be by exothermic welding, pressure connectors, clamps or other suitable mechanical connectors. Mechanical connectors shall be installed in accordance with the manufacturer's instructions. Where a clamp is used, it shall not damage the electrode or the earthing conductor.

Connection devices or fittings that depend solely on solder shall not be used independently, as they do not reliably provide adequate mechanical strength.

NOTE Where vertical electrodes are installed, means may be provided to allow the inspection of the connection and the replacement of the vertical rod.

542.4 Main earthing terminal

542.4.1 In every installation where protective equipotential bonding is used, a main earthing terminal shall be provided and the following shall be connected to it:

iTeh STANDARD PREVIEW
(standards.iteh.ai)

– protective bonding conductors;
– earthing conductors;
– protective conductors;
– functional earthing conductors, if relevant.

IEC 60364-5-54:2011
https://standards.iteh.ai/catalog/standards/sist/473a4ae4-6d31-4d1c-b985-e5883d48ac40/iec-60364-5-54-2011

NOTE 1 It is not intended to connect every individual protective conductor directly to the main earthing terminal where they are connected to this terminal by other protective conductors.

NOTE 2 The main earthing terminal of the building can generally be used for functional earthing purposes. For information technology purposes, it is then regarded as the connection point to the earth.

Where more than one earthing terminal is provided, they shall be interconnected.

542.4.2 Each conductor connected to the main earthing terminal shall be able to be disconnected individually. This connection shall be reliable and such that it can only be disconnected by means of a tool.

NOTE Disconnection means may conveniently be combined with the main earthing terminal, to permit measurement of the resistance of the earth electrode.

543 Protective conductors

NOTE Consideration should be given to requirements provided in Clause 516 of IEC 60364-5-51:2005.

543.1 Minimum cross-sectional areas

543.1.1 The cross-sectional area of every protective conductor shall satisfy the conditions for automatic disconnection of supply required in 411.3.2 of IEC 60364-4-41:2005 and be capable of withstanding mechanical and thermal stresses caused by the prospective fault current during the disconnection time of the protective device.