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Information technology - Cabling installation - Part 3: Installation planning and practices outside buildings

Informationstechnik - Installation von Kommunikationsverkabelung - Teil 3: Installationsplanung und -praktiken im Freien

Technologies de l'information - Installation de câblage - Partie 3: Planification et pratiques d'installation à l'extérieur des bâtiments

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35.110	Omreževanje	Networking

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NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50174-3

October 2013

ICS 35.110

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English version

**Information technology -
Cabling installation -
Part 3: Installation planning and practices outside buildings**

Technologies de l'information -
Installation de câblage -
Partie 3: Planification et pratiques
d'installation à l'extérieur des bâtiments

Informationstechnik -
Installation von
Kommunikationsverkabelung -
Teil 3: Installationsplanung und
Installationspraktiken im Freien

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Foreword

This document (EN 50174-3:2013) has been prepared by CLC/TC 215 "Electrotechnical aspects of telecommunication equipment".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-09-02
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-09-02

This document supersedes EN 50174-3:2003.

EN 50174 comprises three parts:

- EN 50174-1, *Information technology — Cabling installation — Part 1: Installation specification and quality assurance*;
- EN 50174-2, *Information technology — Cabling installation — Part 2: Installation planning and practices inside buildings*;
- EN 50174-3, *Information technology — Cabling installation — Part 3: Installation planning and practices outside buildings* (the present document).

All three parts support the specification, implementation and operation of information technology cabling. There are specific requirements for cabling systems that are in accordance with the design requirements of EN 50173 series. However, the three parts also apply to cabling systems of any design including those in accordance with standards such as EN 50098-1 or EN 50098-2.

This part, EN 50174-3, is concerned with the planning and installation of information technology cabling using metallic cabling and optical fibre cabling outside buildings; it is not confined to the border of a particular premises and includes wide area information technology cabling of any kind. It provides guidance as to the responsibilities of those involved and is intended to be referenced in relevant contracts.

EN 50174-3:2003 (the 1st edition) has been completely revised in the light of the technical evolution and the feedback received from the users of the 1st edition. Major changes include:

- a) restructuring of the contents to align with the structure of EN 50174-1:2009 and EN 50174-2:2009 (including their associated amendments); in particular, the pertinent requirements and recommendations have been clearly distinguished and are presented in separate subclauses;
- b) where appropriate, text has been aligned with that of EN 50174-1 and EN 50174-2;
- c) requirements and recommendations for wide area information technology cabling have been elaborated in greater detail;
- d) a new Annex A on EMC and protection (the existing Annex A is renumbered as Annex B) and a new Annex C on the application of responsibilities have been added.

Introduction

The importance of services delivered by information technology cabling infrastructure is similar to that of utilities such as heating, lighting and electricity supplies. As with those utilities, interruptions to service can have a serious impact. Poor quality of service due to lack of planning, use of inappropriate components, incorrect installation, poor administration or inadequate support can threaten an organisation's effectiveness.

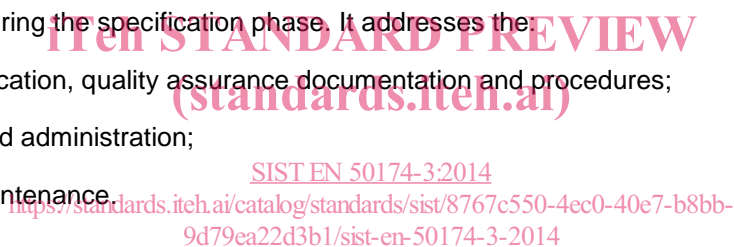
There are four phases in the successful implementation of information technology cabling. These are:

- a) design;
- b) specification – the detailed requirement for the cabling, including the planning of its accommodation and associated building services addressing specific environments (e.g. electromagnetic) together with the quality assurance requirements to be applied;
- c) installation – in accordance with the requirements of the specification;
- d) operation – the management of connectivity and the maintenance of transmission performance during the life of the cabling.

This European Standard is in three parts and addresses the specification, installation and operational aspects. EN 50173 series and other application standards cover design issues.

EN 50174-1 is used during the specification phase. It addresses the

- installation specification, quality assurance documentation and procedures;
- documentation and administration;
- operation and maintenance.



This part, EN 50174-3, and EN 50174-2 are intended to be used by the personnel directly involved in the planning aspects (of the specification phase) and installation phase. EN 50174-2 is applicable inside buildings and EN 50174-3 is applicable outside buildings.

This European Standard is applicable to all types of information technology cabling outside buildings, including generic cabling systems designed in accordance with EN 50173 series. The requirements and recommendations of this European Standard may be applied to cabling that is defined as part of the building.

The planning of the pathway systems, spaces and structures within the core and access network cabling as described in Figure 2 that are owned by access providers is excluded except for requirements and recommendations that provide basic safety, function and environmental objectives for mechanical, ingress and climatic characteristics (i.e. excluding pathway dimensions, distribution of spaces and similar constraints based on specific transmission methods).

This European Standard is also relevant to:

- architects, building designers and builders;
- main contractors;
- designers, suppliers, installers, inspectors (auditors), maintainers and owners of information technology cabling;
- public network providers and local service providers;
- end users.

This part, EN 50174-3, contains requirements and recommendations relating to the installation planning and practices by defining:

- i) planning strategy (road map) and guidance depending on the application, electromagnetic environment, building infrastructure and facilities, etc.;
- ii) planning and installation requirements for metallic and optical fibre information technology cabling depending on the application, electromagnetic environment, building infrastructure and facilities, etc.;
- iii) the practices and procedures to be adopted to ensure that the cabling is installed in accordance with the specification.

Figure 1 and Table 1 show the schematic and contextual relationships between the standards produced by CLC/TC 215 for information technology cabling, namely:

- 1) this part and other parts of EN 50174 series;
- 2) generic cabling design (EN 50173 series);
- 3) application dependent cabling design (e.g. EN 50098 series);
- 4) testing of installed cabling (EN 50346);
- 5) equipotential bonding requirements (EN 50310).

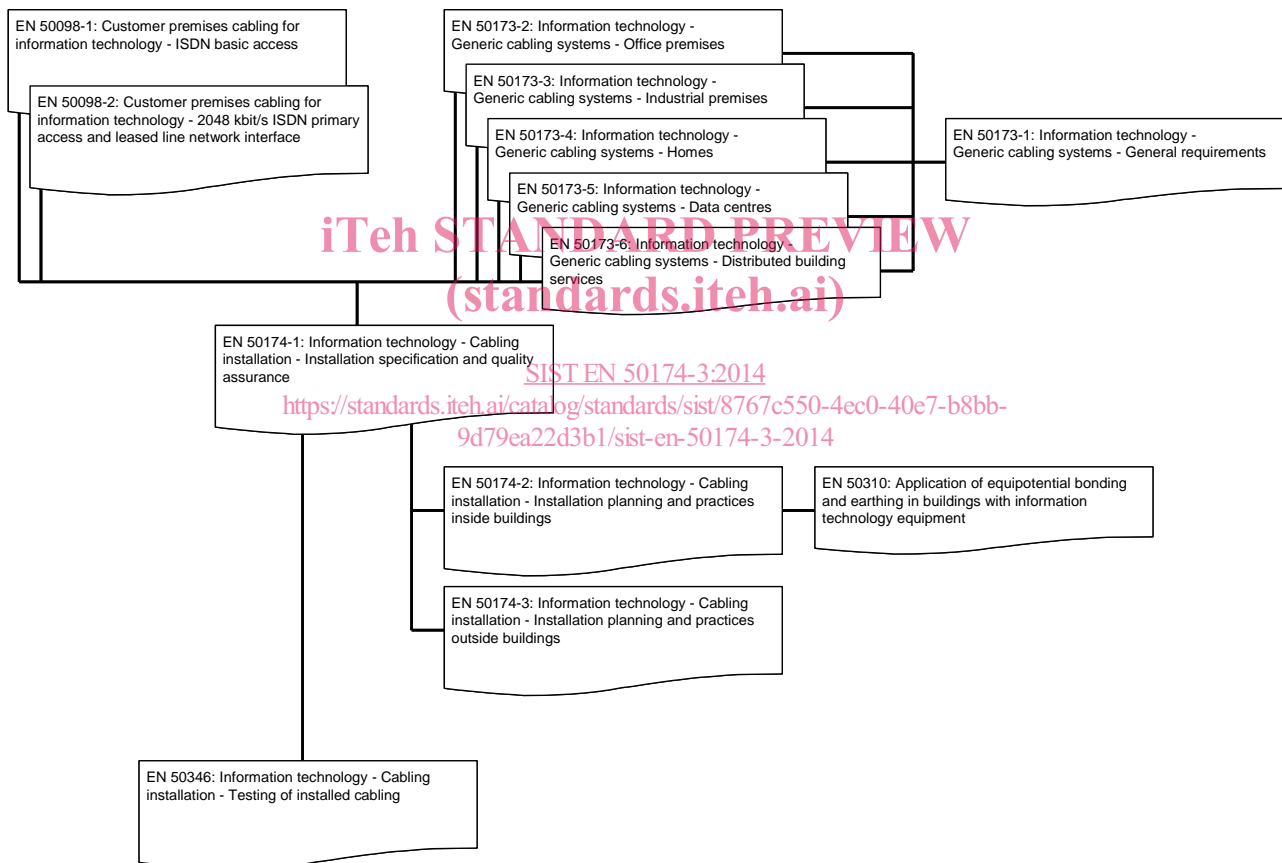


Figure 1 — Schematic relationship between EN 50174 series and other relevant standards

**Table 1 — Contextual relationship between EN 50174 series
and other standards relevant for information technology cabling systems**

Building design phase	Generic cabling design phase	Specification phase	Installation phase	Operation phase
EN 50310 6. Earthing networks	EN 50173 series except EN 50173-4 4: Structure 5: Channel performance 7: Cable requirements 8: Connecting hardware requirements 9: Requirements for cords and jumpers A: Link performance limits and EN 50173-4 4 and 5: Structure 6: Channel performance 8: Cable requirements 9: Connecting hardware requirements 10: Requirements for cords and jumpers A: Link performance limits	EN 50174-1 4: Requirements for specifying installations of information technology cabling 5: Requirements for installers of information technology cabling		EN 50174-1 4: Requirements for specifying installations of information technology cabling
		Planning phase		
		EN 50174-2 4: Requirements for planning installations of information technology cabling 6: Segregation of metallic information technology cabling and power supply cabling 7: Electricity distribution systems and lightning protection	EN 50174-2 5: Requirements for the installation of information technology cabling 6: Segregation of metallic information technology cabling and power supply cabling	
		and EN 50174-3 and (for equipotential bonding) EN 50310	and EN 50174-3 and (for equipotential bonding) EN 50310 and EN 50346 4: General requirements 5: Test parameters for balanced cabling 6: Test parameters for optical fibre cabling	

1 Scope and conformance

1.1 Scope

This European Standard specifies requirements and provides recommendations for the following aspects of information technology cabling:

- a) planning;
- b) installation practice.

This European Standard is applicable to all types of information technology cabling outside buildings including generic cabling systems designed in accordance with EN 50173 series. The requirements and recommendations of this European Standard may be applied to cabling that is defined as part of the building.

The requirements and recommendations of Clauses 4, 5 and 6 of this European Standard are subject to any site-specific requirements and recommendations of Clause 7.

The planning of the pathway systems, spaces and structures within the core and access network cabling as described in Figure 2 that are owned by access providers is excluded except for requirements and recommendations that provide basic safety, function and environmental objectives for mechanical, ingress and climatic characteristics (i.e. excluding pathway dimensions, distribution of spaces and similar constraints based on specific transmission methods).

The installation practices applicable to all cabling installation methods are included by the provision of the necessary planning requirements and recommendations associated with each one with the exception of information technology cabling installed:

- around or within aerial power supply or associated earth conductors;
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- on infrastructures carrying power supplies in excess of AC/DC 25 kV.

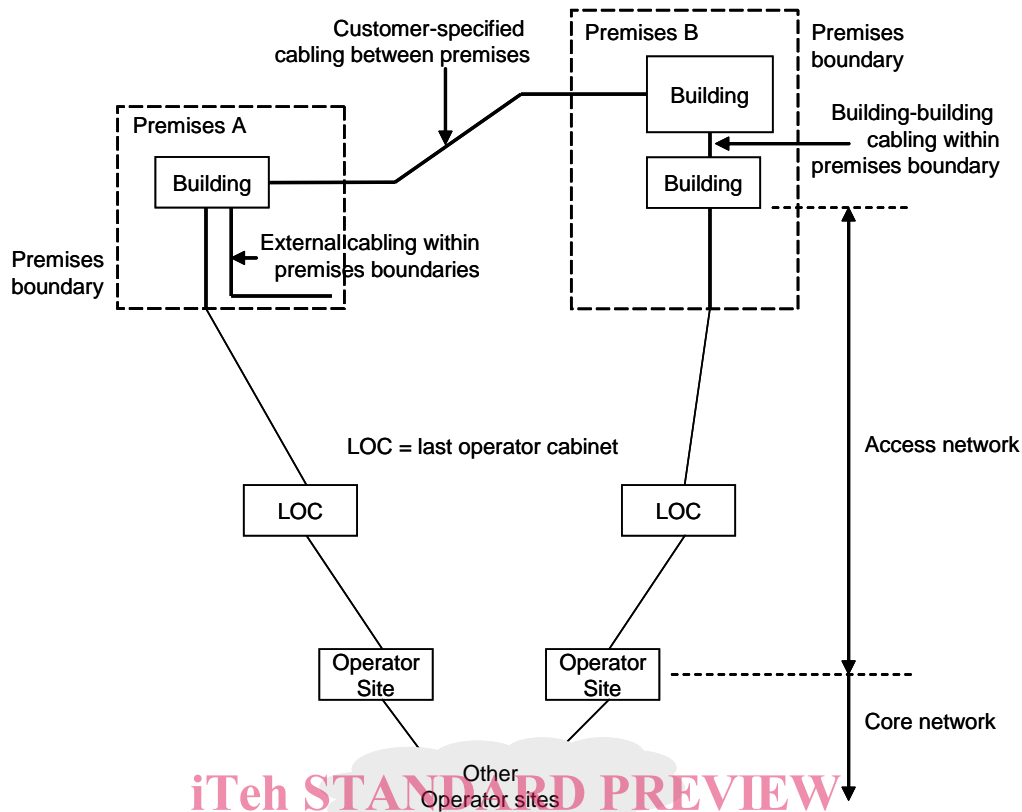
This European Standard:

- 1) details the considerations for satisfactory installation and operation of information technology cabling;
- 2) excludes specific requirements applicable to other cabling systems (e.g. power supply cabling); however, it takes account of the effects other cabling systems may have on the installation of information technology cabling (and vice versa) and gives general advice;
- 3) excludes those aspects of installation associated with the transmission of signals in free space between transmitters, receivers or their associated antenna systems (e.g. wireless, radio, microwave or satellite).

This European Standard is applicable to certain hazardous environments. It does not exclude additional requirements which are applicable in particular circumstances, defined by e.g. electricity supply and electrified railways.

The requirements within this European Standard do not cover any additional requirements for the information technology cables installed in hazardous or stressful environments e.g. electricity supply and electric railway locations (see Clause 7).

Examples of areas covered by this European Standard are shown in Figure 2.



NOTE Pathways and spaces between premises A and B are assumed to be designed to meet specific networking objectives, whereas the pathways and spaces between the premises boundary and the buildings in the premises, if provided by the premises owner, are aimed to be more generic to meet the needs of multiple access providers and transmission systems within their access networks.

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Figure 2 — Examples of areas covered by this document

1.2 Conformance

For a cabling installation to conform to this European Standard:

- the planning of the installation shall meet the requirements of Clause 4;
- the installation practices shall meet the requirements of Clause 5;
- local regulations, including safety, shall be met.

The responsibilities for specific elements of conformance may be made by national-specific amendment of Annex C.

2 Normative references

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

EN 124:1994 ¹⁾, *Gully tops and manhole tops for vehicular and pedestrian areas - Design requirements, type testing, marking, quality control*

EN 12613, *Plastics warning devices for underground cables and pipelines with visual characteristics*

¹⁾ To be replaced by series EN 124, which is at draft stage.

- EN 50085-1, *Cable trunking systems and cable ducting systems for electrical installations — Part 1: General requirements*
- EN 50085-2 (all parts), *Cable trunking systems and cable ducting systems for electrical installations*
- EN 50173-1:2011, *Information technology — Generic cabling systems — Part 1: General requirements*
- EN 50173-2, *Information technology — Generic cabling systems — Part 2: Office premises*
- EN 50173-3, *Information technology — Generic cabling systems — Part 3: Industrial premises*
- EN 50173-4, *Information technology — Generic cabling systems — Part 4: Homes*
- EN 50173-5, *Information technology — Generic cabling systems — Part 5: Data centres*
- EN 50173-6, *Information technology — Generic cabling systems — Part 6: Distributed building services*
- EN 50174-1, *Information technology — Cabling installation — Part 1: Installation specification and quality assurance*
- EN 50310, *Application of equipotential bonding and earthing in buildings with information technology equipment*
- EN 50346, *Information technology — Cabling installation — Testing of installed cabling*
- EN 50411-2-2, *Fibre organisers and closures to be used in optical fibre communication systems — Product specifications — Part 2-2: Sealed pan fibre splice closures Type 1, for category S & A*
- EN 50411-2-3, *Fibre organisers and closures to be used in optical fibre communication systems — Product specifications — Part 2-3: Sealed inline fibre splice closures Type 1, for category S & A*
- EN 50411-2-4, *Fibre organisers and closures to be used in optical fibre communication systems — Product specifications — Part 2-4: Sealed dome fibre splice closures Type 1, for category S & A*
- EN 50411-2-5, *Fibre organisers and closures to be used in optical fibre communication systems — Product specifications — Part 2-5: Sealed closures for air blown fibre microduct, type 1, for category S & A*
- EN 50411-2-9, *Fibre organisers and closures to be used in optical fibre communication systems — Product specifications — Part 2-9: Non-sealed closures for air blown fibre microduct cable, for category S & A*
- EN 60079-0, *Explosive atmospheres — Part 0: Equipment — General requirements (IEC 60079-0)*
- EN 60079-14, *Explosive atmospheres — Part 14: Electrical installations design, selection and erection (IEC 60079-14)*
- EN 60079-17, *Explosive atmospheres — Part 17: Electrical installations inspection and maintenance (IEC 60079-17)*
- EN 60332-1-2, *Tests on electric and optical fibre cables under fire conditions — Part 1-2: Test for vertical flame propagation for a single insulated wire or cable — Procedure for 1 kW pre-mixed flame (IEC 60332-1-2)*
- EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*
- EN 60601-1-2, *Medical electrical equipment — Part 1-2: General requirements for basic safety and essential performance — Collateral standard: Electromagnetic compatibility — Requirements and tests (IEC 60601-1-2)*
- EN 60794-1-2:2003, *Optical fibre cables — Part 1-2: Generic specification — Basic optical cable test procedures (IEC 60794-1-2:2003)*
- EN 60794-3, *Optical fibre cables — Part 3: Sectional specification — Outdoor cables (IEC 60794-3)*
- EN 60794-3-10, *Optical fibre cables — Part 3-10: Outdoor cables — Family specification for duct, directly buried and lashed aerial optical telecommunication cables (IEC 60794-3-10)*
- EN 60794-3-11, *Optical fibre cables — Part 3-11: Outdoor cables — Product specification for duct, directly buried and lashed aerial single-mode optical fibre telecommunication cables (IEC 60794-3-11)*
- EN 60794-3-12, *Optical fibre cables — Part 3-12: Outdoor cables — Detailed specification for duct and directly buried optical telecommunication cables for use in premises cabling (IEC 60794-3-12)*

EN 60794-3-20, *Optical fibre cables — Part 3-20: Outdoor cables — Family specification for self-supporting aerial telecommunication cables (IEC 60794-3-20)*

EN 60794-3-21, *Optical fibre cables — Part 3-21: Outdoor cables — Detailed specification for optical self-supporting aerial telecommunication cables for use in premises cabling (IEC 60794-3-21)*

EN 60794-3-30, *Optical fibre cables — Part 3-30: Outdoor cables — Family specification for optical telecommunication cables for lakes, river crossings and coastal application (IEC 60794-3-30)*

EN 60794-3-40, *Optical fibre cables — Part 3-40: Outdoor cables — Family specification for sewer cables and conduits for installation by blowing and/or pulling in non-man accessible storm and sanitary sewers (IEC 60794-3-40)*

EN 60794-3-50, *Optical fibre cables — Part 3-50: Outdoor cables — Family specification for gas pipe cables and subducts for installation by blowing and/or pulling/dragging in gas pipes (IEC 60794-3-50)*

EN 60794-3-60, *Optical fibre cables — Part 3-60: Outdoor cables — Family specification for drinking water pipe cables and subducts for installation by blowing and/or pulling/dragging/floating in drinking water pipes (IEC 60794-3-60)*

EN 60794-4-20, *Optical fibre cables — Part 4-20: Aerial optical cables along electrical power lines — Family specification for ADSS (All Dielectric Self Supported) optical cables (IEC 60794-4-20)*

EN 60794-5-10²⁾, *Optical fibre cables — Part 5-10: Family specification for outdoor microduct optical fibre cables, microducts and protected microducts for installation by blowing (IEC 60794-5-10²⁾)*

EN 60794-5-20²⁾, *Optical fibre cables — Part 5-20: Family specification for outdoor microduct fibre units, microducts and protected microducts for installation by blowing (IEC 60794-5-20²⁾)*

EN 60825 (all parts), *Safety of laser products (IEC 60825)*

EN 60825-2, *Safety of laser products — Part 2: Safety of optical fibre communication systems (OFCS) (IEC 60825-2)*

EN 60950 (all parts), *Information technology equipment — Safety (IEC 60950)*

EN 60950-1, *Information technology equipment — Safety — Part 1: General requirements (IEC 60950-1)*

EN 61386-1, *Conduit systems for cable management — Part 1: General requirements (IEC 61386-1)*

EN 61386-2X (all parts), *Conduit systems for cable management — Part 2X: Particular requirements (IEC 61386-2X series)*

EN 61534 (all parts), *Powertrack systems (IEC 61534)*

EN 61537, *Cable management — Cable tray systems and cable ladder systems (IEC 61537)*

EN 61643 (all parts), *Low-voltage surge protective devices (IEC 61643)*

EN 61969-1, *Mechanical structures for electronic equipment — Outdoor enclosures — Part 1: Design guidelines (IEC 61969-1)*

EN 61969-2, *Mechanical structures for electronic equipment — Outdoor enclosures — Part 2: Coordination dimensions (IEC 61969-2)*

HD 384/HD 60364 (all parts), *Electrical installations of buildings / Low-voltage electrical installations (IEC 60364 series)*

HD 60364-4-444, *Low-voltage electrical installations — Part 4-444: Protection for safety — Protection against voltage disturbances and electromagnetic disturbances (IEC 60364-4-44:2007 (Clause 444), modified)*

HD 60364-5-534, *Low-voltage electrical installations — Part 5-53: Selection and erection of electrical equipment — Isolation, switching and control — Clause 534: Devices for protection against overvoltages (IEC 60364-5-53:2001/A1:2002 (Clause 534), modified)*

2) In preparation.

HD 60364-5-54, *Low-voltage electrical installations — Part 5-54: Selection and erection of electrical equipment — Earthing arrangements and protective conductors (IEC 60364-5-54)*

ITU-T K.68, *Operator responsibilities in the management of electromagnetic interference by power systems on telecommunication systems*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 50174-1 and the following apply.

Where the cabling is designed in accordance with standards in EN 50173 series, the additional definitions of those standards are applicable.

3.1.1

access network

functional elements (equipment and infrastructure) that enable communication between the core network and a customer network

[SOURCE: CLC/TR 50173-99-2:2012, 3.1.1]

3.1.2

access provider

operator or another entity providing the means to enable external telecommunications service provision to a subscriber

3.1.3

anchor wire

guy wire

tensioned cable designed to add stability to a supporting structure for information technology or other cabling

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3.1.4

access point

location in pathways where access is intended to be provided

Note 1 to entry: Examples are maintenance holes, hand holes, buried closures, spaces and structures.

3.1.5

campus

premises containing one or more buildings

[SOURCE: EN 50173-1:2011, 3.1.23]

3.1.6

catenary wire

wire hung at a specific tension between supporting structures for information technology cabling

3.1.7

core network

functional elements (that is equipment and infrastructure) that enable communication between operator sites and/or network data centres

3.1.8

hand hole

point off access to a pathway that is too small for a person to enter to perform work but that allows the routing of cables during the cable installation process such that bending and pulling requirements are met