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Information technology — Data centre facilities and infrastructures —

Part 2: Building construction

Technologie de l'information — Installation et infrastructures de centres de traitement de données —

Partie 2: Construction des bâtiments

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability, IT and data centres*.

This first edition cancels and replaces ISO/IEC TS 22237-2:2018, which has been technically revised.

The main changes are as follows:

— the interrelationship between this document and ISO/IEC 22237-6 concerning constructional prerequisites for the implementation of security concepts and desired security systems has been more clearly presented;

— the document has been restructured;

  — Clause 6, “Site configuration”, has been split and relevant subclauses have been moved into a new Clause 7, “Outside spaces”;

  — Clause 7, “Building construction”, has been completely revised to present all requirements and recommendations in a single Clause 8;

  — Clause 8, “Data centre spaces and access routes”, has been revised to focus on the design of data centre spaces (now Clause 9);

  — a new Clause 10, “Construction of data centre spaces”, has been added;

  — the content of Clause 9, “Fire compartments, fire barriers and fire suppression systems”, has been revised (now Clause 11);

  — Annex A on additional requirements and recommendations has been removed;

  — Annex B on physical protection against external hazards has been revised as Annex A “Building materials”;

— a new Annex B summarizing the requirements and recommendations of Clause 5 has been added.

A list of all parts in the ISO/IEC 22237 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

Introduction

The unrestricted access to internet-based information demanded by the information society has led to an exponential growth of both internet traffic and the volume of stored/retrieved data. Data centres house and support the information technology and network telecommunications equipment for data processing, data storage and data transport. They are required both by network operators (delivering those services to customer premises) and by enterprises within those customer premises.

Data centres need to provide modular, scalable and flexible facilities and infrastructures to easily accommodate the rapidly changing requirements of the market. In addition, the energy consumption of data centres has become critical, both from an environmental point of view (reduction of carbon footprint), and with respect to economic considerations (cost of energy) for the data centre operator.

The implementation of data centres varies in terms of:

a) purpose (enterprise, co-location, co-hosting or network operator facilities);

b) security level;

c) physical size; and

d) accommodation (mobile, temporary and permanent constructions).

NOTE Cloud services can be provided by all data centre types mentioned.

The needs of data centres also vary in terms of availability of service, the provision of security, and the objectives for energy efficiency. These needs and objectives influence the design of data centres in terms of building construction, power distribution, environmental control, telecommunications cabling and physical security. Effective management and operational information are required to monitor achievement of the defined needs and objectives.

The ISO/IEC 22237 series specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation and maintenance of facilities and infrastructures within data centres. These parties include:

1) owners, operators, facility managers, ICT managers, project managers and main contractors;

2) consultants, architects, building designers and builders, system/installation designers, auditors, test and commissioning agents;

3) suppliers of equipment; and

4) installers and maintainers.

The inter-relationship of the various documents within the ISO/IEC 22237 series at the time of publication is shown in Figure 1.

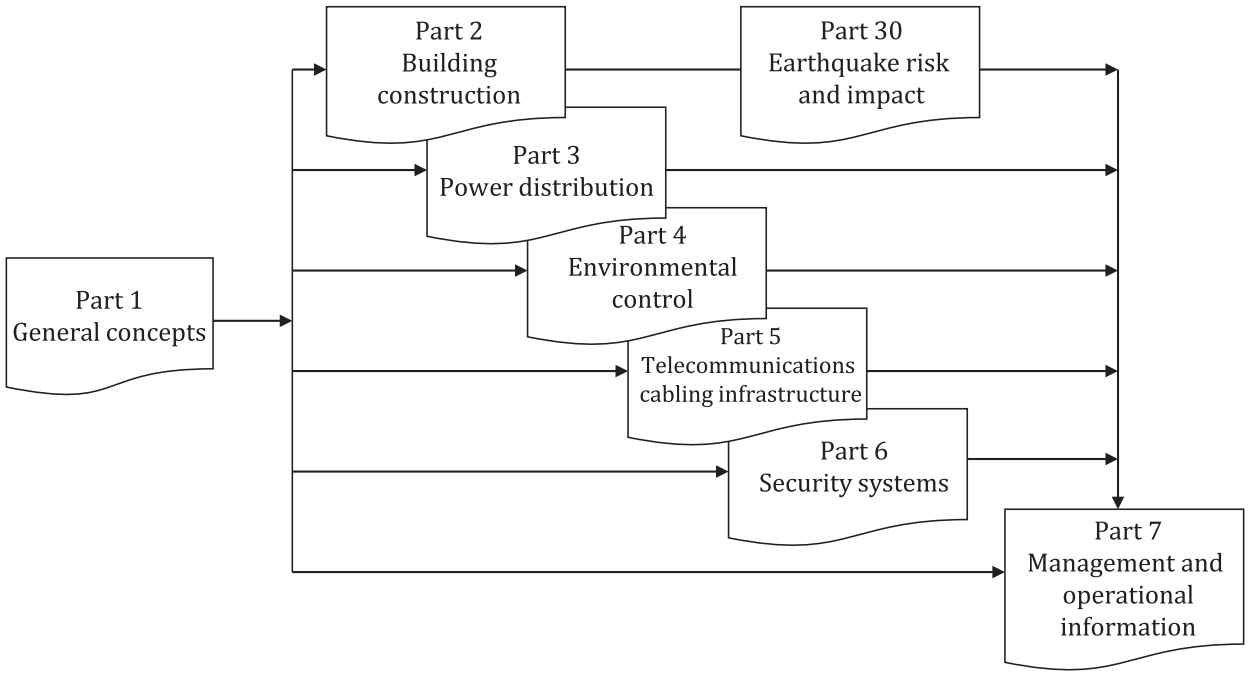

Figure 1 — Schematic relationship between the documents of the ISO/IEC 22237 series

ISO/IEC 22237-2 to ISO/IEC 22237-6 specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for "availability", "physical security" and "energy efficiency enablement", according to ISO/IEC 22237–1.

This document, ISO/IEC 22237-2, addresses the building design of data centres. It addresses physical security issues from a construction point of view, as opposed to ISO/IEC 22237-6, which specifies the pertinent security system requirements of those facilities and infrastructures (in accordance with the requirements of ISO/IEC 22237-1).

ISO/IEC TS 22237-7 addresses the operational and management information (in accordance with the requirements of ISO/IEC 22237-1).

This document is intended for use by and collaboration between architects, building designers and builders, system and installation designers.

The ISO/IEC 22237 series does not address the selection of information technology and network telecommunications equipment, software and associated configuration issues.

Information technology — Data centre facilities and infrastructures —

Part 2: Building construction

1 Scope

This document specifies requirements and recommendations for the construction of buildings and other structures which provide accommodation for data centres based on the criteria and classification for "physical security" within ISO/IEC 22237-1 in support of availability.

This document specifies requirements and recommendations for the following:

a) location and site selection (taking in to account natural environment and adjacencies);

b) protection from environmental risks;

c) site configuration;

d) building construction;

e) building configuration;

f) provision of access;

g) physical intrusion protection;

h) physical fire protection;

i) protection against damage from water;

j) quality construction measures.

Safety and electromagnetic compatibility (EMC) requirements are outside the scope of this document and are covered by other standards and regulations. However, information given in this document can be of assistance in meeting these standards and regulations.

Conformance of data centres to the present document is covered in Clause 4.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO/IEC 22237-1, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

ISO/IEC 22237-3, *Information technology — Data centre facilities and infrastructures — Part 3: Power distribution*

ISO/IEC 22237-4, *Information technology — Data centre facilities and infrastructures — Part 4: Environmental control*

ISO/IEC 22237-6, *Information technology — Data centre facilities and infrastructures — Part 6: Security systems*

ISO/IEC 30129, *Information technology — Telecommunications bonding networks for buildings and other structures*

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

ISO/IEC TS 22237-5, *Information technology — Data centre facilities and infrastructures — Part 5: Telecommunications cabling infrastructure*

ISO/IEC TS 22237-7, *Information technology — Data centre facilities and infrastructures — Part 7: Management and operational information*

ISO/IEC TS 22237-30, *Information technology — Data centre facilities and infrastructures — Part 30: Earthquake risk and impact analysis*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 22237-1 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1.1
effective height of free-standing barrier
h_e
shortest distance between any point on the top of the permanent part of the free-standing barrier (excluding any toppings) and the surface of the supporting ground when measured in the plane of the barrier

3.1.2
free-standing barrier
wall, fence, gate, turnstile or other similar self-supporting barrier, and their associated foundations, designed to prevent entry to a space of a given Protection Class

3.1.3
topping
construction, added to the top of a free-standing barrier, and designed to be an effective intruder-deterrent or for a decorative display of security

3.1.4
pathway
defined route of different media between identified points

Note 1 to entry: Examples of media are bus bars, cables, conduits, ducts, pipes.

3.1.5
raised access floor
system consisting of completely removable and interchangeable floor panels that are supported on an adjustable substructure to allow the area beneath the raised access floor panels to be used by building services

3.2 Abbreviated terms

For the purposes of this document the following abbreviated terms apply: