



# SLOVENSKI STANDARD

## SIST EN 50600-2-1:2014

01-maj-2014

---

**Informacijska tehnologija - Naprave in infrastruktura podatkovnega centra - 2-1.  
del: Konstrukcija stavbe**

Information technology - Data centre facilities and infrastructures - art 2-1: Building construction

Informationstechnik - Einrichtungen und Infrastrukturen von Rechenzentren - Teil 2-1: Gebäudekonstruktion

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 50600-2-1:2014](https://standards.iteh.ai/catalog/standards/sist/516c80fc-4d1b-4938-ac1d-94b1c271786/sist-en-50600-2-1-2014)

**Ta slovenski standard je istoveten z: EN 50600-2-1:2014**

---

**ICS:**

35.020	Informacijska tehnika in tehnologija na splošno	Information technology (IT) in general
35.110	Omreževanje	Networking
91.140.50	Sistemi za oskrbo z elektriko	Electricity supply systems

**SIST EN 50600-2-1:2014**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 50600-2-1:2014

<https://standards.iteh.ai/catalog/standards/sist/516c80fc-4d1b-4938-ac1d-94f31c271786/sist-en-50600-2-1-2014>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 50600-2-1**

March 2014

ICS 35.020; 35.110; 91.140.50

English version

**Information technology -  
Data centre facilities and infrastructures -  
Part 2-1: Building construction**

Technologies de l'information -  
Installation et infrastructures des centres  
de traitement de données -  
Partie 2-1: Construction des bâtiments

Informationstechnik -  
Einrichtungen und Infrastrukturen von  
Rechenzentren -  
Teil 2-1: Gebäudekonstruktion

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

This European Standard was approved by CENELEC on 2014-01-06. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**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**

## Contents

Foreword .....	4
Introduction.....	5
<b>1 Scope.....</b>	<b>7</b>
<b>2 Normative references.....</b>	<b>7</b>
<b>3 Terms, definitions and abbreviations .....</b>	<b>8</b>
<b>3.1 Terms and definitions .....</b>	<b>8</b>
<b>3.2 Abbreviations .....</b>	<b>9</b>
<b>4 Conformance .....</b>	<b>9</b>
<b>5 Location .....</b>	<b>9</b>
<b>5.1 Assessment of location.....</b>	<b>9</b>
<b>5.2 Geographical location.....</b>	<b>10</b>
<b>5.3 Natural environment .....</b>	<b>10</b>
<b>5.4 Adjacencies .....</b>	<b>10</b>
<b>5.5 Infrastructure factors .....</b>	<b>11</b>
<b>6 Site configuration.....</b>	<b>11</b>
<b>6.1 General .....</b>	<b>11</b>
<b>6.2 Site selection .....</b>	<b>12</b>
<b>6.3 Assessment of existing premises .....</b>	<b>13</b>
<b>6.4 Utilities .....</b>	<b>13</b>
<b>6.5 Access routes.....</b>	<b>13</b>
<b>6.6 Deliveries .....</b>	<b>14</b>
<b>6.7 Parking .....</b>	<b>14</b>
<b>6.8 Exterior installations.....</b>	<b>14</b>
<b>6.9 Perimeter.....</b>	<b>15</b>
<b>7 Building construction .....</b>	<b>15</b>
<b>7.1 Building structure .....</b>	<b>15</b>
<b>7.2 Foundations.....</b>	<b>16</b>
<b>7.3 Exterior walls .....</b>	<b>16</b>
<b>7.4 Interior walls providing boundaries of Protection Class .....</b>	<b>17</b>
<b>7.5 Roofs .....</b>	<b>17</b>
<b>7.6 Rain water drainage .....</b>	<b>18</b>
<b>7.7 Floors and Ceilings .....</b>	<b>18</b>
<b>7.8 Corridors and doors.....</b>	<b>19</b>
<b>8 Data centre spaces and access routes .....</b>	<b>19</b>
<b>8.1 Accommodation .....</b>	<b>19</b>
<b>8.2 Protection.....</b>	<b>21</b>
<b>8.3 Floors .....</b>	<b>22</b>
<b>8.4 Ceilings .....</b>	<b>23</b>
<b>8.5 Access to data centre spaces .....</b>	<b>23</b>
<b>8.6 Vapour density .....</b>	<b>23</b>

<b>9</b>	<b>Fire compartments, fire barriers and fire suppression systems</b> .....	<b>24</b>
<b>9.1</b>	<b>General</b> .....	<b>24</b>
<b>9.2</b>	<b>Fire barriers</b> .....	<b>24</b>
<b>9.3</b>	<b>Fire compartments for gaseous extinguishing systems</b> .....	<b>25</b>
<b>9.4</b>	<b>Fire suppression</b> .....	<b>25</b>
<b>10</b>	<b>Building configurations</b> .....	<b>26</b>
<b>10.1</b>	<b>Design phase</b> .....	<b>26</b>
<b>10.2</b>	<b>Inter-relationship of functional spaces</b> .....	<b>26</b>
<b>Annex A</b>	<b>(normative) Additional requirements and recommendations</b> .....	<b>28</b>
<b>A.1</b>	<b>Utilities</b> .....	<b>28</b>
<b>A.2</b>	<b>Personnel entrance and lobby</b> .....	<b>28</b>
<b>A.3</b>	<b>Docking bay</b> .....	<b>28</b>
<b>A.4</b>	<b>Other rooms</b> .....	<b>28</b>
<b>Annex B</b>	<b>(informative) Physical protection against external hazards</b> .....	<b>29</b>
<b>B.1</b>	<b>General</b> .....	<b>29</b>
<b>B.2</b>	<b>Building codes</b> .....	<b>29</b>
<b>B.3</b>	<b>Protection for IT equipment and data storage</b> .....	<b>29</b>
<b>Bibliography</b>	.....	<b>31</b>
<b>ITeh STANDARD PREVIEW</b> <b>(standards.iteh.ai)</b>		
<b>Figures</b>		
<b>Figure 1</b>	<b>— Schematic relationship between the EN 50600 standards</b> .....	<b>6</b>
<b>Figure 2</b>	<b>— Site of a Data Centre</b> .....	<b>12</b>
<b>Tables</b>		
<b>Table 1</b>	<b>— Load capacity guidance</b> .....	<b>22</b>

## Foreword

This document (EN 50600-2-1:2014) 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) 2015-01-06
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2015-01-06

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 50600-2-1:2014](https://standards.iteh.ai/catalog/standards/sist/516c80fc-4d1b-4938-ac1d-94f31c271786/sist-en-50600-2-1-2014)

<https://standards.iteh.ai/catalog/standards/sist/516c80fc-4d1b-4938-ac1d-94f31c271786/sist-en-50600-2-1-2014>

## 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 are housing and supporting 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, energy consumption of data centres has become critical both from an environmental point of view (reduction of carbon footprint) and with respect to economical 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;
- d) accommodation (mobile, temporary and permanent constructions).

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 and physical security. Effective management and operational information is required to monitor achievement of the defined needs and objectives.

This series of European Standards 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, facility managers, ICT managers, project managers, main contractors;
- 2) consultants, architects, building designers and builders, system and installation designers;
- 3) facility and infrastructure integrators, suppliers of equipment;
- 4) installers, maintainers.

At the time of publication of this European Standard, EN 50600 series will comprise the following standards:

EN 50600-1: *Information technology — Data centre facilities and infrastructures — Part 1: General concepts;*

EN 50600-2-1: *Information technology — Data centre facilities and infrastructures — Part 2-1: Building construction;*

EN 50600-2-2: *Information technology — Data centre facilities and infrastructures — Part 2-2: Power distribution;*

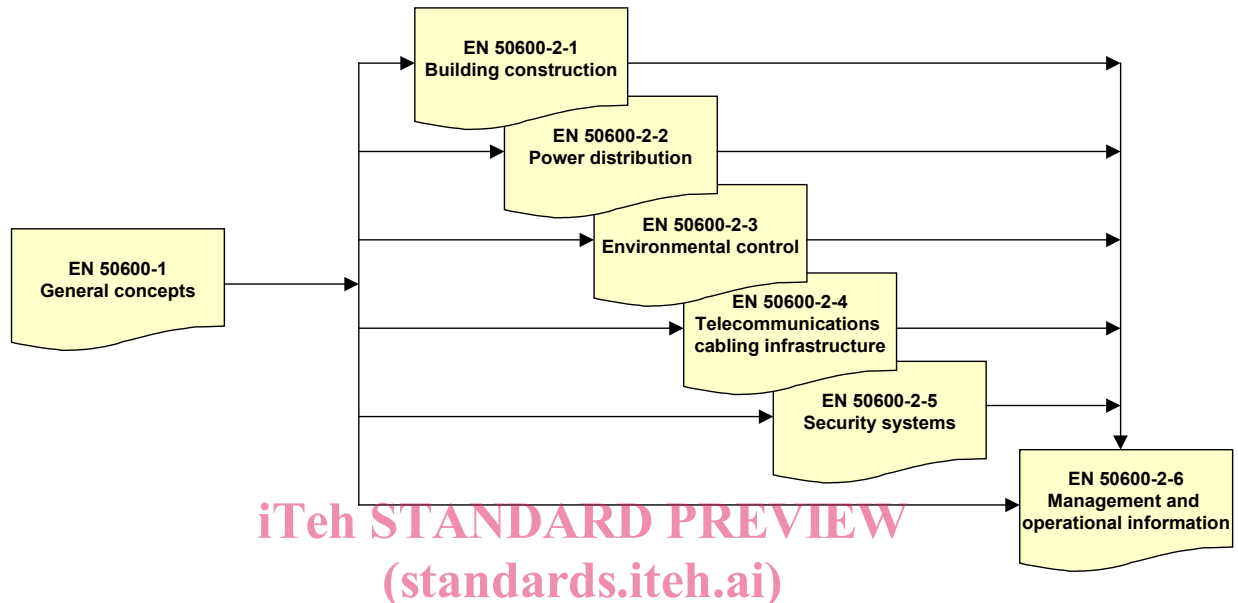
EN 50600-2-3: *Information technology — Data centre facilities and infrastructures — Part 2-3: Environmental control;*

EN 50600-2-4: *Information technology — Data centre facilities and infrastructures — Part 2-4: Telecommunications cabling infrastructure;*

EN 50600-2-5: *Information technology — Data centre facilities and infrastructures — Part 2-5: Security systems;*

EN 50600-2-6: *Information technology — Data centre facilities and infrastructures — Part 2-6: Management and operational information.*

The inter-relationship of the standards within the EN 50600 series is shown in Figure 1.



**Figure 1 — Schematic relationship between the EN 50600 standards**

[SIST EN 50600-2-1:2014](https://standards.iteh.ai/catalog/standards/sist/516c80fc-4d1b-4938-ac1d-44f1700338/en-50600-2-1-2014)

[https://standards.iteh.ai/catalog/standards/sist/516c80fc-4d1b-4938-ac1d-](https://standards.iteh.ai/catalog/standards/sist/516c80fc-4d1b-4938-ac1d-44f1700338/en-50600-2-1-2014)

44f1700338/en-50600-2-1-2014  
EN 50600-2-X standards specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for “availability”, “physical security” and “energy efficiency enablement” selected from EN 50600-1.

This European Standard addresses the building design of data centres; it addresses security issues from a constructional point of view, whereas EN 50600-2-5 specifies the pertinent security system requirements of those facilities and infrastructures (in accordance with the requirements of EN 50600-1).

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

This series of European Standards does not address the selection of information technology and network telecommunications equipment, software and associated configuration issues.



## 1 Scope

This European Standard addresses the construction of buildings and other structures which provide accommodation for data centres based upon the criteria and classification for “physical security” within EN 50600-1 in support of availability.

This European Standard specifies requirements and recommendations for the following:

- a) location and site selection;
- b) building construction;
- c) building configuration;
- d) fire protection;
- e) quality construction measures.

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

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

**iTeh STANDARD PREVIEW**

## 2 Normative references (standards.iteh.ai)

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 12825:2001, *Raised access floors*

EN 15004-1, *Fixed firefighting systems — Gas extinguishing systems — Part 1: Design, installation and maintenance (ISO 14520-1:2006, modified)*

EN 50174-1, *Information technology — Cabling installation — Part 1: Installation specification and quality assurance*

EN 50174-3, *Information technology — Cabling installation — Part 3: Installation planning and practices outside buildings*

EN 50310, *Application of equipotential bonding and earthing in buildings with information technology equipment*

EN 50600-1:2012, *Information technology — Data centre facilities and infrastructures — Part 1: General concepts*

EN 50600-2-2, *Information technology — Data centre facilities and infrastructures — Part 2-2: Power distribution*

EN 50600-2-3 <sup>1)</sup>, *Information technology — Data centre facilities and infrastructures — Part 2-3: Environmental control*

---

<sup>1)</sup> Draft for formal vote under preparation.

EN 50600-2-4 <sup>2)</sup>, *Information technology — Data centre facilities and infrastructures — Part 2-4: Telecommunications cabling infrastructure*

EN 50600-2-5 <sup>3)</sup>, *Information technology — Data centre facilities and infrastructures — Part 2-5: Security systems*

EN 62305 (all parts), *Protection against lightning (IEC 62305, all parts)*

### 3 Terms, definitions and abbreviations

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions in EN 50600-1 and the following apply.

##### 3.1.1

###### **access floor**

system consisting of completely removable and interchangeable floor panels that are supported on adjustable pedestals connected by stringers to allow the area beneath the floor to be used by building services

##### 3.1.2

###### **access provider**

operator of any facility that is used to convey telecommunications signals to and from a customer premises

##### 3.1.3

###### **building entrance facility**

facility that provides all necessary mechanical and electrical services for the entry of telecommunications cables into a building and which may allow for transition from external to internal cable

[SOURCE: EN 50600-1:2012, 3.1.2 and EN 50173-1:2011, 3.1.17]

##### 3.1.4

###### **modular construction**

method which uses standardized prefabricated construction elements with the possibility to add extra elements when more space is required

##### 3.1.5

###### **pathway**

defined route for different media between identified points

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

##### 3.1.6

###### **plenum**

compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system

##### 3.1.7

###### **room in room**

construction method to have a physically independent chamber (walls and ceiling) in a new or existing building

---

<sup>2)</sup> Circulated for CENELEC enquiry.

<sup>3)</sup> Draft for CENELEC enquiry under preparation.

Note 1 to entry: Room in room can provide high level fire rating, water tightness, smoke tightness and intrusion protection required for IT environments.

## 3.2 Abbreviations

For the purposes of this document the following abbreviations apply:

DC	Direct Current
HVAC	Heating, Ventilation, Air Conditioning
IT	Information Technology

## 4 Conformance

For a data centre to conform to this European Standard:

- a) its location shall have been selected following a site assessment as required in Clause 5;
- b) it shall comply with the site requirements of Clause 6;
- c) it shall meet the building construction requirements of Clause 7 where the data centre spaces are within buildings;
- d) it shall meet the building configuration requirements detailed in Clause 8;
- e) it shall meet the fire protection requirements of Clause 9;
- f) it shall meet the quality construction measures of Clause 10;
- g) local regulations, including safety, shall be met.

## 5 Location

### 5.1 Assessment of location

#### 5.1.1 Requirements

The location of a site for a data centre can be assessed either for a “green field” construction of a new data centre or the evaluation of an existing site. The location shall be assessed against the following criteria:

- a) geographical location (see 5.2);
- b) natural environment (see 5.3);
- c) adjacencies (see 5.4);
- d) infrastructural factors (see 5.5);
- e) budgetary factors such as site costs and cost to bring utilities to the site;
- f) local regulation issues.

Personnel factors (operational personnel, security personnel) are not covered in this clause.

### 5.1.2 Recommendations

None.

## 5.2 Geographical location

### 5.2.1 Requirements

The elevation above sea level can have a direct influence on the performance of technical equipment and shall be considered.

### 5.2.2 Recommendations

The choice of a location of a new data centre should consider:

- a) assessment of its impact on the environment;
- b) any opportunities to take advantage of renewable sources of energy (e.g. wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases).

## 5.3 Natural environment

### 5.3.1 Requirements

An environmental risk analysis shall be conducted which, as a minimum, considers the following items:

- a) flooding;
- b) active seismic zones,
- c) high wind velocities;
- d) air contamination by natural causes (volcanic activities, etc.);
- e) near to coast lines;
- f) lower than sea level;
- g) on special purpose flood plains.

Where the placement of a data centre in a location with negative environmental influences is unavoidable, these influences shall be mitigated by protective constructional, technical, and/or organizational measures.

### 5.3.2 Recommendations

None.

## 5.4 Adjacencies

### 5.4.1 Requirements

A risk analysis shall be conducted which, as a minimum, considers adjacency to the following items:

- a) facilities storing, processing or in other ways dealing with nuclear, explosive, flammable or toxic substances or other hazardous materials;