INTERNATIONAL STANDARD

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Building construction — Accessibility and usability of the built environment

Construction immobilière — Accessibilité et facilité d'utilisation de l'environnement bâti

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 21542 was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 16, *Accessibility and usability of the built environment*.

This first edition cancels and replaces ISO/TR 9527:1994.

Introduction

This International Standard provides building users, architects, designers, engineers, builders, building owners and managers, manufacturers, policy makers and legislators with requirements and recommendations to create a sustainable built environment which is accessible.

The purpose of this International Standard is to define how the built environment should be designed, constructed and managed to enable people to approach, enter, use, egress from and evacuate a building independently, in an equitable and dignified manner and to the greatest extent possible.

The intention of this International Standard is to meet the needs of the majority of people. This goal is achieved by agreement on minimum standards of provision which are generally accepted to accommodate the diversities of age and of human condition. This agreement has been reached by consensus between different countries all over the world.

In some countries a higher level of technical specifications has been achieved due to their long history in developing accessible building standards and regulations. The requirements of this International Standard are not intended to replace more demanding requirements defined in those national standards or national regulations.

These principles are supported by Preamble (g) and Articles 9, 10 and 11 of the United Nations Convention on the Rights of Persons with Disabilities.

NOTE 1 The Convention on the Rights of Persons with Disabilities, with its Optional Protocol, was adopted by the General Assembly of the United Nations on 13 December 2006. It came into force, i.e. became an international legal instrument, on 3 May 2008. Furthermore, information about the Convention and its text can be found on the United Nations website: http://www.un.org/disabilities/. The Convention is serviced by a joint secretariat, consisting of staff from both the United Nations Department of Economic and Social Affairs (DESA), based in New York, and the Office of the High Commissioner for Human Rights (OHCHR) in Geneva.

This International Standard sets out the objectives, design considerations, requirements and recommendations that ISO expects to result in accessible and usable buildings when fully implemented.

This International Standard should be applied to new and existing buildings.

If these design requirements are taken into consideration in the early stages of building design, the costs of providing accessibility and usability measures are minimal and raise the value of the property in terms of sustainability. Where alterations and refurbishment occur, the additional cost depends on the size and complexity of the particular building and its adaptations.

NOTE 2 For further information on costs of accessible buildings see ETH-Study from Switzerland: http://www.hindernisfrei-bauen.ch/kosten_f.php.

This International Standard contains a combination of essential requirements, i.e. provisions which are essential for accessibility and usability of the built environment, and recommendations for an improved environment. The essential requirements are preceded by the word “shall”. For recommendations which are desirable, the provisions are preceded by the word “should”.

This International Standard may be applied in accordance with the National Regulations of the Member Bodies who have adopted this International Standard and stated in their National Foreword the terms under which it is to be applied.

This International Standard may be used by

a) national authorities to determine a specific programme of implementation, and

b) building owners to fulfil their responsibilities according to anti-discrimination and equity legislation, or on a voluntary basis.

As most buildings are subject to refurbishment, upgrade or change of use at some stage during their life cycle, national regulations can require all or part of this International Standard to be applied.

National building regulations may include considerations of legislation on equality, particular building and site constraints, different types of buildings, and the costs and benefits to society generally. It is also important to ensure that existing buildings of historical, architectural and cultural importance are accessible. In such cases it might be necessary for national authorities to allow some exceptions to this International Standard, as well as recommending appropriate alternative accessibility measures.

This International Standard should lead to continuous improvement in the built environment. Whilst the objectives always remain unchanged, the means of achieving them is part of a continuing process of change, i.e. as human knowledge and building technology improve and as the relationship between generally accepted building practice and technology alters.

ISO/IEC Guide 71 and its guidance document ISO/TR 22411 should be used to augment and assist in understanding the requirements of this International Standard.

Within the figures all dimensions are given in millimetres and measured from finished surfaces, unless otherwise stated. All figures are provided as examples.

Building construction — Accessibility and usability of the built environment

1 Scope

This International Standard specifies a range of requirements and recommendations for many of the elements of construction, assemblies, components and fittings which comprise the built environment. These requirements relate to the constructional aspects of access to buildings, to circulation within buildings, to egress from buildings in the normal course of events and evacuation in the event of an emergency. An informative annex is also included which deals with aspects of accessibility management in buildings.

This International Standard contains provisions with respect to features in the external environment directly concerned with access to a building or group of buildings from the edge of the relevant site boundary or between such groups of buildings within a common site. This International Standard does not deal with those elements of the external environment, such as public open spaces, whose function is self-contained and unrelated to the use of one specific building, nor does it deal with single family dwellings, other than those circulation spaces and fittings that are common to two or more such dwellings.

At present, consideration is being given to the development and publication of additional parts to this International Standard to deal with the types of external environments described above and single family dwellings.

For existing buildings there are options included in some paragraphs which appear as *"exceptional considerations for existing buildings in developing countries"* (see "Guidance on the Implications of the ISO Global Relevance Policy for CEN Standardization", 2005) and as *"exceptional considerations for existing buildings"* where a lesser standard than expected in new developments is accepted on the grounds of technical and economic circumstances only.

The dimensions stated in this International Standard, relevant to the use of wheelchairs, are related to the footprint of commonly used wheelchair sizes and users. The footprint for a wheelchair within this International Standard is based on ISO 7176-5 and ISO/TR 13570-2[1)] and is 800 mm wide and 1 300 mm long. For larger wheelchairs and scooters, dimensions will have to be considered accordingly.

NOTE This International Standard is primarily written for adults with disabilities but it includes some specifications regarding the specific accessibility requirements that would suit children with disabilities. However, it is envisaged that more detailed requirements will be included in future revisions of this International Standard.

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.

ISO 4190-1:2010, *Lift (Elevator) installation — Part 1: Class I, II, III and VI lifts*

ISO 4190-5:2006, *Lift (Elevator) installation — Part 5: Control devices, signals and additional fittings*

1) Under preparation.

ISO 7176-5, *Wheelchairs — Part 5: Determination of dimensions, mass and manoeuvring space*

ISO 9386-1, *Power-operated lifting platforms for persons with impaired mobility — Rules for safety, dimensions and functional operation — Part 1: Vertical lifting platforms*

ISO 9386-2, *Power-operated lifting platforms for persons with impaired mobility — Rules for safety, dimensions and functional operation — Part 2: Powered stairlifts for seated, standing and wheelchair users moving in an inclined plane*

ISO/TR 13570-2[1)], *Wheelchairs — Part 2: Typical values and recommended limits or dimensions, mass and manoeuvring space as determined in ISO 7176-5*

ISO/IEC Guide 71, *Guidelines for standards developers to address the needs of older persons and persons with disabilities*

International Commission on Illumination, CIE, Publication 15:2004, 3rd Edition, *Colorimetry*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 71 and the following apply.

3.1
ability
faculty
identifiable human attribute, including but not exclusively, to walk, to speak, to hear, to see, to feel by touch, to taste, to understand, and recognize

3.2
accessibility
〈buildings or parts of buildings〉 provision of buildings or parts of buildings for people, regardless of disability, age or gender, to be able to gain access to them, into them, to use them and exit from them

NOTE Accessibility includes ease of independent approach, entry, evacuation and/or use of a building and its services and facilities, by all of the building's potential users with an assurance of individual health, safety and welfare during the course of those activities.

3.3
area of rescue assistance
building space directly adjoining, and visible from, a main vertical evacuation route, robustly and reliably protected from heat, smoke and flame during and after a fire, where people can temporarily wait with confidence for further information, instructions, and/or rescue assistance, without obstructing or interfering with the evacuation travel of other building users

NOTE "Robust" means structurally hardened and resistant to mechanical damage during the fire and for a period of time afterwards, i.e. the cooling phase.

3.4
assisted evacuation
strategy that exists during which a designated person or persons provide assistance, during an emergency, to another person to leave a building or a specific part of the built environment and to reach a final place of safety

1) Under preparation.

3.5
assistive product
product especially produced or generally available, for preventing, compensating for, monitoring, relieving or neutralizing impairments, activity limitations and participation restrictions

EXAMPLE Devices, equipment, instruments, technology and software.

[ISO 9999:2007, definition 3.3]

3.6
attention pattern
tactile walking surface indicators (TWSIs) that call attention to particular decision points

3.7
audio description
verbal narration that conveys the visual aspects of a presentation or performance

3.8
building related ill-health
adverse impact on the health of building users while living, working, generally occupying or visiting a specific building caused by the planning, design, construction, management, operation or maintenance of that building

3.9
buffer zone
compartments and/or spaces immediately adjoining the fire compartment in a building

3.10
built environment
external and internal environments and any element, component or fitting that is commissioned, designed, constructed and managed for use by people

NOTE Loose items are excluded because decisions with respect to their location within the built environment are more likely to be under the day-to-day control of facilities managers and not of those who commission, design or construct the built environment.

3.11
circulation space
unobstructed space necessary for access to, into and within and egress from any part of the built environment

3.12
colour deficiency
inability to perceive certain colours and to clearly distinguish between combinations of these colours

3.13
common
serving more than one single-family dwelling or more than one building or more than one tenancy

3.14
contraflow
⟨fire⟩ emergency access by fire fighters or rescue teams into a building and towards a fire, while people are still moving away from the fire and evacuating the building

3.15
disorientation
permanent or temporary inability of a person to orient himself or herself with regard to space, time and context in either the built environment or virtual environment

NOTE Acute disorientation brought on by the use of alcohol, “social” drugs and some medicines, or dramatic alterations in a person's circumstances, e.g. involvement in a fire incident, is not uncommon or abnormal. Long term progressive disorientation is a symptom of a variety of psychological and/or neurological disorders.

3.16
doorset
building component consisting of a fixed part (the door frame), one or more movable parts (the door leaves), and their hardware, the function of which is to allow, or to prevent, access and egress

NOTE A doorset can also include a door sill or threshold.

3.17
evacuation from a building on fire
to withdraw, or cause to withdraw, all users from a fire building in planned and orderly phased movements to a place of safety remote from the building

3.18
evacuation lift
lift that can be used, during an emergency, for self or assisted egress

3.19
fire compartment
enclosed space, which may be subdivided, separated from adjoining spaces by fire barriers

[ISO 13943:2008, definition 4.102]

3.20
fire compartmentation
division of a building into fire-tight compartments, by fire and smoke resisting elements of construction, in order to:

— contain an outbreak of fire;

— prevent damage, within the building, to other adjoining compartments and/or spaces;

— protect a compartment interior from external fire attack, e.g. fire spread across the building's facade or from an adjacent building;

— minimize adverse, or harmful, environmental impacts outside the building

NOTE In a fire situation, fire-induced progressive collapse may commence before any breach of “integrity” occurs in the boundary of a fire compartment.

3.21
fire defence plan
operational guide for a specific building comprising fire engineering drawings, descriptive text, fire safety related product/system information, with supporting calculations and fire test data developed from the fire engineering strategy

3.22
fire engineering strategy
coherent and purposeful arrangement of fire prevention, fire protection and fire management measures which is developed in order to attain specified fire engineering design objectives

NOTE Some “fire safety objectives” may be required by legislation.

3.23
fire prevention
all measures necessary to prevent an outbreak of fire in a building, including such secondary activities as fire research and education of the public concerning fire hazard

3.24
fire protection
use of spatial planning, building design, construction, services, systems, personnel and equipment in order to control and extinguish fire, and minimize any adverse or harmful environmental impacts caused

3.25
fire resistance
ability of an element of construction to withstand heat, smoke and flame or give protection from them for a period of time

NOTE Adapted from ISO 13943:2008.

3.26
fire resisting doorset
doorset, properly installed or mounted on site, the function of which is to resist the passage of heat, smoke and flame for a specified time during a fire

3.27
going
tread
⟨stair⟩ horizontal distance between two consecutive nosings, measured on the centre line

3.28
going
⟨ramp⟩ horizontal distance between the start and finish of a flight of a ramp

3.29
guiding pattern
tactile walking surface indicators (TWSIs) to indicate a direction of travel

3.30
habitable room
room, intended for dwelling purposes, including a kitchen, a bathroom and a utility room

3.31
handrail
component of a stair or of a ramp or other building components that provides guidance, balance and support

NOTE Adapted from ISO 6707-1:2004, 5.2.73.

3.32
hearing enhancement system
piece of equipment, product system, hardware, software or service that is used to increase, maintain or improve listening capabilities of individuals with hearing impairments

3.33
impairment
limitation in body function or structure such as a significant deviation or loss which can be temporary due, for example, to injury, or permanent, slight or severe and can fluctuate over time, in particular, deterioration due to ageing

NOTE 1 Body function can be a physiological or psychological function of a body system; body structure refers to an anatomic part of the body such as organs, limbs and their components (as defined in ICIDH-2 of July 1999).

NOTE 2 This definition differs from that in ISO 9999:2007, taken from ICF 2001, WHO: “problems in body function or structure, such as a significant deviation or loss”.

NOTE 3 Adapted from ISO/TR 22411:2008.

3.34
impairment, cognitive
deficiency of neuropsychological function which can be related to injury or degeneration in specific area(s) of the brain