

**Gradnja objektov - Potrebe invalidov in drugih funkcionalno oviranih ljudi v stavbah - Smernice za projektiranje**

Building construction -- Needs of disabled people in buildings -- Design guidelines

Construction immobilière -- Besoins des handicapés dans les bâtiments -- Lignes directrices pour la conception (standards.iteh.ai)

Ta slovenski standard je istoveten z: **ISO/TR 9527:1994**  
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**ICS:**

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91.040.01	Stavbe na splošno	Buildings in general

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# TECHNICAL REPORT

**ISO**  
**TR 9527**

First edition  
1994-09-15

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## **Building construction — Needs of disabled people in buildings — Design guidelines**

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*Construction immobilière — Besoins des handicapés dans les  
bâtiments — Lignes directrices pour la conception*

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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.

The main task of technical committees is to prepare International Standards, but in exceptional circumstances a technical committee may propose the publication of a Technical Report of one of the following types:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

ISO/TR 9527, which is a Technical Report of type 3, was prepared by Technical Committee ISO/TC 59, *Building construction*, Subcommittee SC 1, *Dimensional coordination*.

It must be emphasised that the provisions of this Technical Report are guidelines and not standardized requirements. A number of sources of information have been drawn on in setting out the guidance contained in the publication, and it is recognized that further work is necessary to validate some of the criteria that it contains. The material is based on research carried out up till the mid-1980s. New research and national regulations or laws (such as the ANSI standard, regulations in response to the Americans with Disabilities Act, Canadian and Japanese standards) may provide for sizes which differ from those given in this Technical Report. Nevertheless, it is substantially correct.

## Introduction

The problems of the handicapped, in as far as they present practical challenges to designers and architects, are the particular concern of a working group of the International Organization for Standardization. This group, set up by ISO's technical committee on building construction, has felt it appropriate - particularly in view of the prominence given this subject in 1981 - to draw up some guidance for planners and for the formulation of local regulation, standards, recommendations, etc.

This document provides that information; not in the form of a standard, though it may be drawn upon by anyone concerned with describing the functional needs of the handicapped, but in the form of a general account of basic and particular needs.

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## Applications

Requirements put forward by handicapped people to achieve basic accessibility are relatively few, they can be met easily at the planning stage of a building and many of them can be instituted during reconstruction. Moreover, many of these requirements can be satisfied by rearranging facilities without making extensive alterations and adaptations. However, in order to achieve this implementation practically and economically, requirements should be identified and taken into consideration at an early stage of planning and construction.

Accordingly, standardization work is of great significance in this field, and the needs of the handicapped should be considered when ISO standards are drafted. By this means standards would contribute to gradual development towards better accessibility in the environment.

## Fundamental needs of disabled people

### People with impaired mobility

#### Wheelchair users

The main problems of wheelchair users are, obviously, moving about and working from a sitting position; thus many requirements are associated with the dimensions and other aspects of wheelchairs. The characteristics of people using manually propelled or electric indoor wheelchairs have been used as a basis for the following guidelines. They do not cater for electric outdoor wheelchairs which customarily require larger spaces.

The length of wheelchairs varies generally between 1100 mm and 1200 mm. The user's feet add approximately 50 mm to the overall length.

The width of wheelchairs varies generally between 600 mm and 700 mm. To propel a chair manually by operating the rims of the main wheels a clearance of not less than 50 mm, and preferably 100 mm, is needed. Over longer travel distances additional space is needed.

Space requirements for manoeuvring are always related to the activities to be performed. Different users act in different ways, depending on individual performance and the type of chair used.



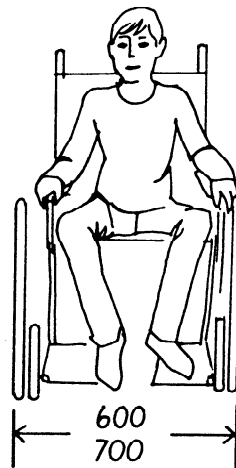


Figure 1

*The width of wheelchairs generally varies between 600 mm and 700 mm.*

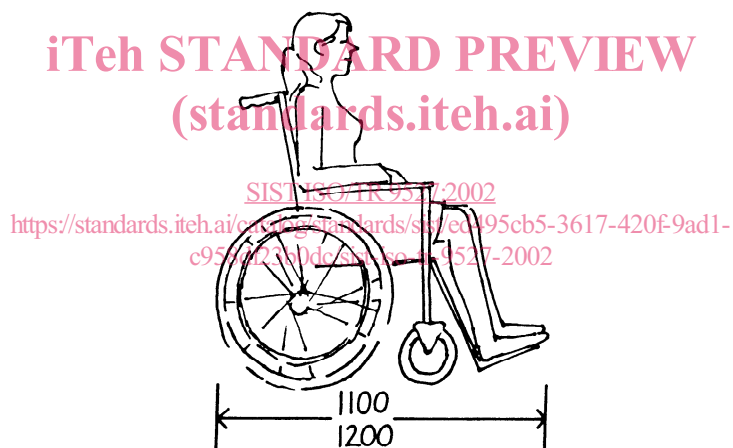


Figure 2

*The length of wheelchairs generally varies between 1100 mm and 1200 mm. The user's feet add approx. 50 mm to the length.*

When planning spaces in buildings to cater for wheelchair turning, a guide is to impose on the plan a circle of 1500 mm diameter. If this space is clear, the plan arrangement will normally be satisfactory. However, spaces in doorways, niches and under work-tops, desks or furniture can often be used when turning. Where a high degree of accessibility is required, such as in hospital buildings, spaces should be more generous.

Considerable energy is needed to propel a wheelchair manually up ramps, over changes in level or over soft or uneven surfaces. Thresholds and changes in level should be avoided. Ground and floor surfaces should be hard and even.

Most wheelchairs have a seat height of about 500 mm. The reach of a wheelchair user is constrained by his seated position. Access to room corners, work benches with base units, etc., is limited by the wheels of the chair and the footrest extension.

The reach of a wheelchair user is confined to a zone 700 mm to 1200 mm above floor level and not less than 400 mm from room corners.

For wheelchair access to a work bench, wash basin or table, a clear space for knees and footrests is needed. This should be at least 800 mm wide, 600 mm deep and 650 mm to 700 mm high. For wheelchair users the convenient height of worktops is between 750 mm and 850 mm; flexible provision is preferred.

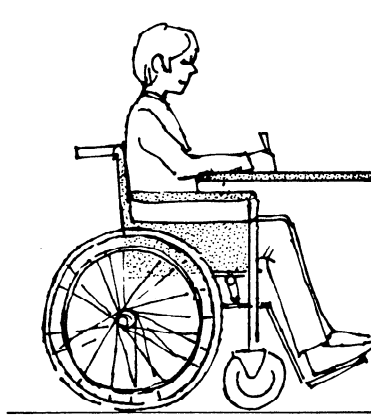


Figure 3

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*A clear space for knees and footrests is needed under worktops, wash basins, etc.*

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### Ambulant disabled people

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For ambulant disabled people to move securely, ground and floor surfaces should be even and slip-resistant. Handrails should be provided on stairs and ramps. Resting places, such as benches, should be provided along travel routes.

Where there is a change of ground or floor surface, these should have similar friction, to decrease the risk of stumbling.

Benches and chairs should have a seat height of approximately 450 mm and they should have armrests approximately 700 mm above floor level.

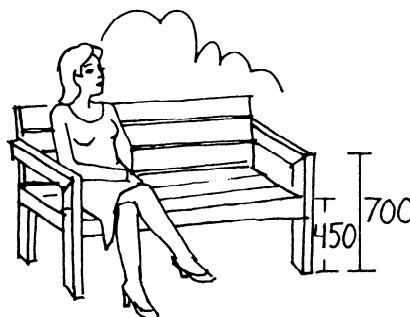


Figure 4

*Benches, with a seat height of approx. 450 mm and with armrests approx. 700 mm above ground level, should be provided along travel routes.*

## People with impaired vision

For people with impaired vision, orientation can be aided by marking with the use of colour, illumination and, in certain cases, the texture of material. Design and plan arrangements should be simple and uncomplicated.

Contrasting colours should be used to aid the identification of doors, stairs ramps, passage ways, skirting boards, etc. Surfaces can be varied to indicate passage ways, changes of direction, etc. Orientation cues should be specially illuminated. Handrails can be used as a locational aid.

To minimize the risk of falls and injuries, hazards such as posts, single steps and projections from walls should be avoided wherever possible. Hazards should be emphasized by means of illumination and by contrasting colours and materials.

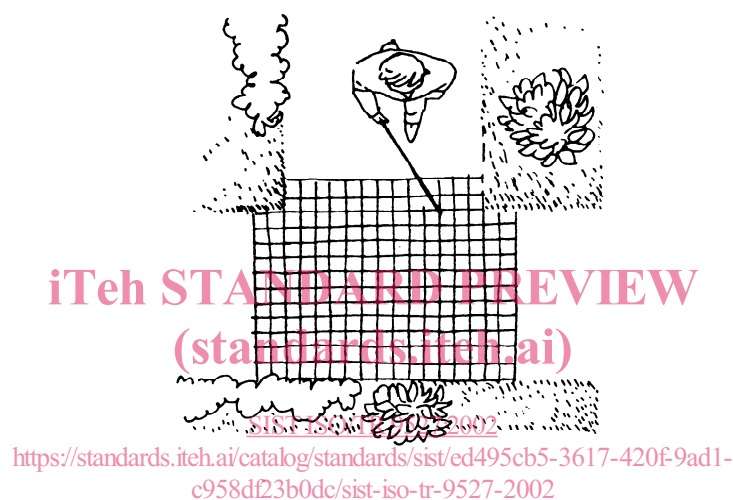


Figure 5

*To indicate passageways, changes of direction, etc., varied surfaces should be used.*

People with impaired vision are often sensitive to glare. Unwanted mirroring effects and reflections may be avoided by attention to the location of windows and illumination, and the choice of floor and wall surfaces.

People with impaired vision often have difficulty reading signs and other printed information. Blind people are restricted to tactile reading. Visual information in, for example, railway stations and airports should be supplemented with audible information.

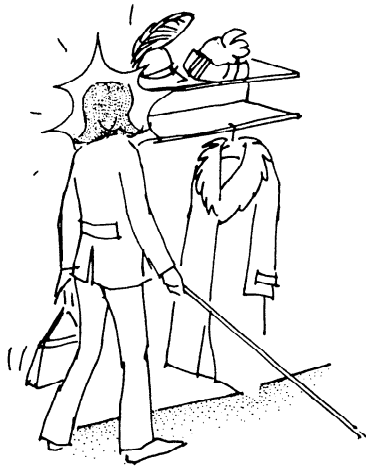


Figure 6

*For people with impaired vision, projections from walls should be avoided.*

### People with impaired hearing

People with impaired hearing have particular difficulty in comprehending sounds and words in noisy environments. Rooms should be acoustically well insulated.

In public buildings loudspeaking systems should be clearly audible. Supplementary visual information should be provided, for example, in railway stations and airports.

People with impaired hearing may rely on lip reading; this is helped if there is good overall lighting which is non-reflective.

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They may have difficulty using telephones, etc. Audible signals may in certain cases be supplemented with visual signals.

Induction loops may be installed in auditoria, theatres, meeting rooms, etc., to improve sound reception for people using hearing aids. Infra-red sound reinforcement systems may also be provided in multiplex auditoria to avoid sound overspill from one area to another.

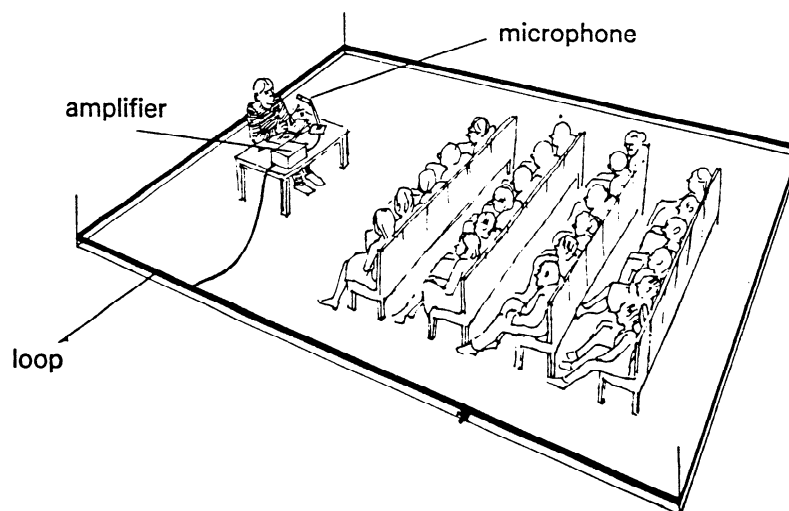


Figure 7

*Principles of an induction loop system which improves sound reception for people using hearing aids.*

## Other groups of handicapped people

### People with allergies

People with allergies may be sensitive to dust, mildew, pollen, animal hair, formalin, turpentine, etc. Some are sensitive to contact with substances and materials such as nickel, chromium and rubber. Equipment and materials causing allergic reactions should as far as possible be avoided in dwellings and buildings.

### People with heart and lung diseases

People with heart and lung diseases may only be able to walk short distances and may be unable to climb stairs. The requirements of these people are similar to those with impaired mobility.

### People with epilepsy, haemophilia, etc.

The requirements of those with epilepsy, haemophilia, etc. are related primarily to the design of dwellings and the need to minimize the risk of injury caused by falling or encountering obstacles.

### People with incontinence, enterostomy operations, etc.

The requirements of people with incontinence and enterostomy operations (colostomies, ileostomies and urostomies) are mainly related to bathroom provision. In certain circumstances, for example in public WC compartments, it may be desirable to provide a special sink e. g. for emptying urine bags.

### Mentally handicapped people

Mentally handicapped people form a very heterogeneous group and they have diverse environmental needs. Simple and uncomplicated solutions are preferred with clear and unambiguous signposting, etc.

## Building components and spaces in buildings

### Doors

#### Door width

To enable wheelchair users to pass through doors, the minimum width should be 760 mm, i.e. a 9M door. In certain cases the clear width should be 850 mm to 900 mm; for example if the wheelchair has to be turned in the doorway, where there is a door closer or threshold, or at entrance doors to public buildings and in other situations where there is considerable traffic.