

HOW TO OVERCOME PHYSICAL BARRIERS IN NATURE EXPERIENCE

Brochure I03



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I. Introduction

This guideline *“How to overcome physical barriers in nature experience”* is developed in the framework of the Erasmus+ project **„Assuring the access to nature education and nature experience for impaired people“** (acronym: Nature without Barriers). The aim of the project is to make nature an experience available for everyone. For almost 80 million people in Europe, everyday life is associated with a wide variety of barriers. Access to nature is often difficult for people with disabilities. Ramps instead of stairs are not enough to make an area barrier-free. Accessibility means that services are readily available to everyone without outside help. Ramps, but also sign language, Braille boards, and audible information contribute to this purpose.

Nature conservation centres and environmental educators, who want to get acquainted with the topic of barrier free nature experience, have little practical material at their disposal. This may be one reason why disabled people are largely excluded from environmental education. In this project, we want to address this obvious lack. We need more barrier-free access so that everyone can experience nature. Our project develops guidelines for barrier free modification of nature trails and other offers for nature experience. It provides good examples from four European countries: Austria, Germany, Hungary and Poland. With this project, we want to promote the inclusion of people with disabilities in the EU and inspire all Europeans for nature.

In the framework of the project, different guidelines and handbooks have been elaborated, which are available on the project website: <https://www.nature-without-barriers.eu/>. For instance, the guideline *“Nature experience and education for people with disabilities”* provides suggestions for working with disabled people and organising guided tours for them. The practice-oriented brochure *“Self-determined nature experience”* focuses on re-designing nature trails and experiences for barrier-free independent use by disabled people. It also includes a correspondent decision matrix to dismantle both physical and communication barriers. The structure of this brochure is based on the service chain used in the matrix. Therefore, references to the relevant points of the matrix can be found under the description of each accessibility measure. You can check the matrix for additional information.

Last, but not least, the project addresses also physical and communication barriers. If you would like to learn more about how to overcome communication obstacles with people with disabilities, our educational guideline *“How to overcome communication barriers in nature experience”* will help you. While if you are interested in overcoming physical barriers, this brochure **“How to overcome physical barriers in nature experience” provides assistance for the implementation of the adjustments obtained from the self-assessment matrix.** It addresses adaptations and descriptions of nature trails, and provides pedagogical guidance to assure safe and barrier-free movement. The brochure consists of three main parts. The first part gives a general overview about the different visitor groups and their difficulties. Moreover, it offers an insight into the European accessibility standards and briefly introduces the relevant national standards in the countries participating in the project. The second part of the brochure introduces concrete measures on how physical barriers can be eliminated or significantly reduced in nature trails. References to the matrix, given after each measure, give help to design accessibility improvements.

As the state of standardisation on accessibility and the measures to meet the regulations are different in each country, we are not able to introduce all national requirements in detail. Instead, we would like to give an overview on the functional requirements. If you are interested in implementing measures to improve the accessibility of your nature trail or exhibition centre, please check your national requirements in advance.

1.1. Description of target groups

When people with disabilities go out to experience nature, they face various problems and obstacles. Among others, they may find narrow trails, muddy surfaces, or too steep routes. They may not find appropriate resting areas and barrier-free toilets. Moreover, they may not have appropriate access to information in advance nor at the site. These are just a few examples of the many difficulties that impaired people may have. Physical obstacles cause problems mainly for people with motor impairments and blind and visually impaired people. The understanding of information instead, can cause difficulties particularly for deaf and hard of hearing people and for people with learning difficulties.

In general, we can conclude that people with disabilities have special needs and requirements. Each impairment is diverse and individual. If someone is living with two or more disabilities (e.g. in the case of deaf blindness), it is even more difficult for the person to experience the environment. Therefore, we cannot give general solutions suitable for everybody. The entire nature cannot be made accessible for everyone. But we believe that various barrier-free nature experience can be offered to each target group. The goal is that everyone should find suitable offers for themselves in nature.

In the framework of the project, we have already introduced the main groups of people with disabilities in detail and the difficulties they face, when they try to experience nature. We do not want to repeat that information in this brochure again. If you are interested, please check the guideline “Nature experience and education for people with disabilities” for more information about people with motor impairments, blind and visually impaired people, deaf and hard of hearing people, as well as people with learning difficulties. The guideline is available on the project website: <https://www.nature-without-barriers.eu/en/guided-nature-experience-for-people-with-disabilities.html>

1.2. Description of relevant standards and specifications in the EU

The European Commission in 2007 has supported the definition of European accessibility requirements for public procurement in the built environment through the standardisation mandate 420 given to CEN (European Standardisation Committee). This was done in support of the disability policy.

The work under this mandate was divided into two phases.

Phase I of the mandate was to compile the existing accessibility standards of EU countries and their level of detail and to assess the feasibility of European and international accessibility standards. As a result of this phase, it became obvious how different are the state of standardisation and the legal implementation obligations of accessibility across EU countries.

Phase II of the mandate started in 2018 and it is still ongoing. It will lead to a European Standard EN 17210 “Accessibility and usability of the built environment - Functional requirements” for accessibility to the built environment. This standard is very comprehensive and covers all parts of the built environment, including nature trails as well. This standard must be adopted by the national standardisation bodies.

The committee is also elaborating a technical report “prTR EN 17621:2020 /Accessibility and usability of the built environment –Technical performance criteria and specifications”, which includes technical requirements for conformity assessment. The application of this standard will not be mandatory in all EU nations, if they have already their own technical specification standards in conformity with the EN 17210. However, it is expected that in those countries, which do not have technical specification standards, the application of these standards will be mandatory. This technical report is mainly based on the ISO 21542 from 2011.

The ISO 21542 standard “Building construction - Accessibility and usability of the built environment” was published in December 2011. This standard can be applied in those EU countries, which do not have a standard for accessibility in the environment. The international standard ISO 21542 is being revised since 2016. The technical report prTR EN 17621 is mainly based on the ISO 21542 - 2011 and partially on the revised edition.

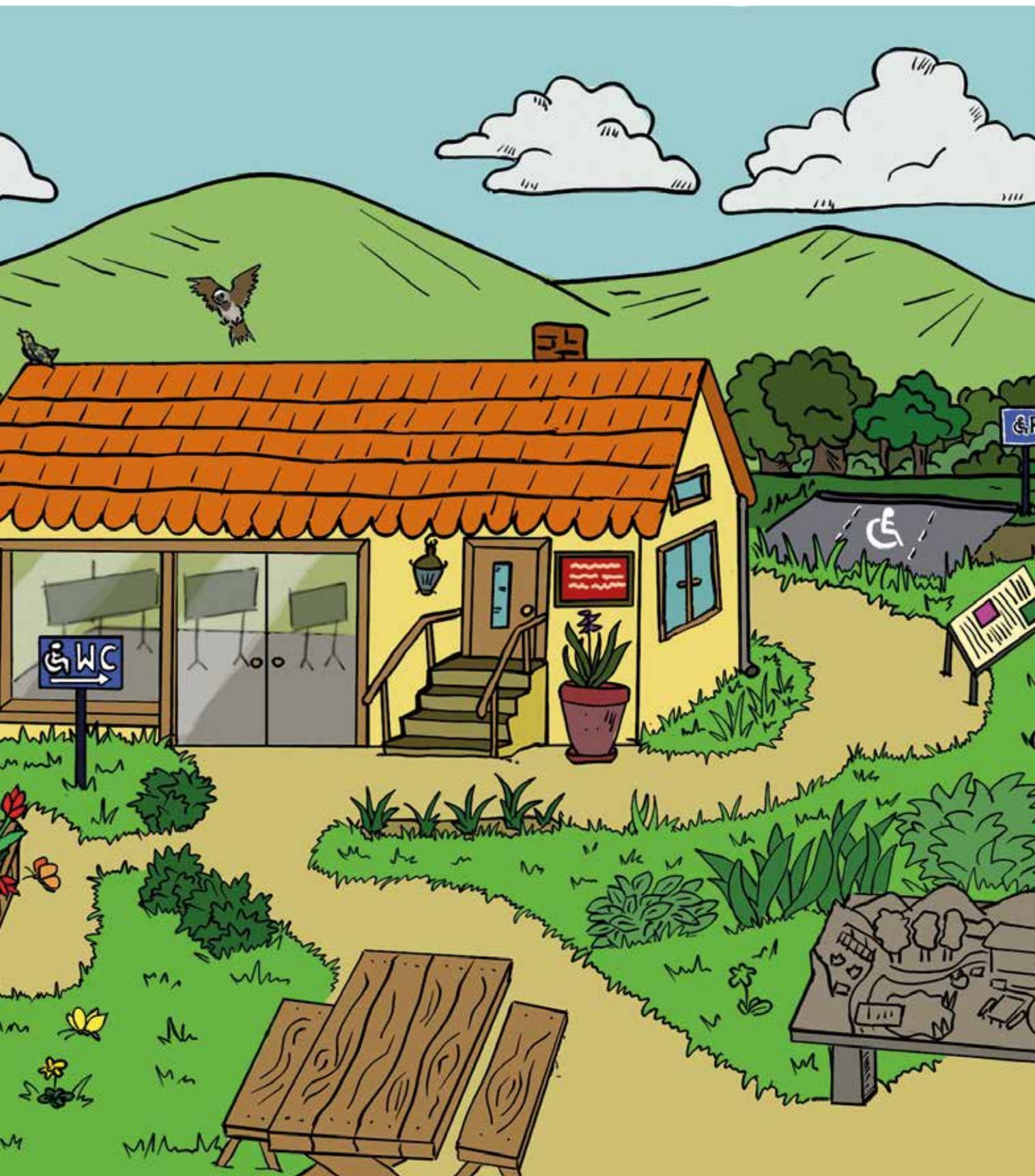
More information on the accessibility standards and regulations, which are in effect in the countries of the “Nature without Barriers” project partners, can be found on page 53 of this guideline.

We hope to contribute to more offers for disabled people and to broaden the understanding of nature and biodiversity’s value.

Berlin-Radolfzell-Siófok-Wroclow-Vienna. August 2021



Drawing of a nature conservation centre.



II. Measures for the elimination of physical barriers

Due to the implementation of different accessibility standards and regulations in each (partner) country, it is not possible to introduce the dimensions of national measures in detail. Therefore, the partner organisations of the “Nature without Barriers” project have agreed to describe mainly functional requirements in this guideline. If dimensions are mentioned, they are taken from ISO 21542-2011 and the revised version of ISO 21542, when listed in pr En 17621.

When you apply this part of the guideline, please do not forget to check what standards are in effect in your country and what measures are used to meet these requirements.

II.1. Location and arrival

The location and the accessibility of nature trails, national parks and botanical gardens can be very different and very diverse. Some of them are located in urban or residential areas, while others can be found in the close neighbourhood of settlements (within walking distance) or even in areas located further away, which can only be accessed by using vehicles or public transport. Topographic conditions can also be very different. Some of them are located on flat terrains, while others are found in mountainous-hilly areas, at swampy areas or at the seaside. Accordingly, it might be difficult to access these areas. There might be smaller and bigger obstacles, both physical and in terms of orientation.

Reference to the evaluation matrix: Point 2.

II.1.1. Arrival on foot (walking)

The appropriate design of sidewalks is important for visitors, who arrive on foot. Sidewalks are footpaths that usually run parallel to roads, but are separated. They have paved surfaces and they adjoin the connecting road.

Sidewalks should be accessible and safe for everyone. Therefore, they should have flat and even surfaces. There should not be level differences bigger than 5 mm on the sidewalk's walking surface. It is also important that the surface is non-slippery.

During the design of sidewalks, special attention should be paid for the appropriate lateral slope to drain rainwater. If the **lateral slope** of the path is more than 2%, it is difficult to walk on it when going uphill. Moreover, people using wheelchairs can lose their balance when they are going downhill and turning direction, as the wheelchair can become uncontrollable. Sidewalks usually slope toward the roads. If wheels do not grip or balance is lost, people can find themselves directly on the road. People using crutches and sticks for walking are particularly sensitive to lateral incline when they are going down a slope.

In addition, the **incline of sidewalks** should not be too steep (not more than ~3-5%, depending on the national requirements). If the routes are steeper, it may be useful to design and construct them as ramps (although it is not obligatory in each country). Accordingly, we can build resting areas on the slope (minimum every ~10 meters), install double height handrails and provide

edge protection (e.g. curbs). These solutions can be helpful not only for impaired visitors, but for anyone.

It is very important that the sidewalks should be appropriately wide for wheelchair users. There are differences in the national regulations, but in general, the width of sidewalks should be minimum ~1.80 m for providing enough space for two wheelchairs next to each other. If there is an obstacle on the road, which cannot be eliminated, at least 0.9 m wide free area must be provided (but 0.9 m is acceptable only for a short passage).

Taking into account that wheelchair users need more space for turning and changing direction, than moving always in the same direction, more space should be provided at turning points (free area of at least ~1.50 m in diameter). If walking aids, guide dogs, or white sticks are used or there is an accompanying assistant, appropriately wide (~1.50-1.80 m) sidewalks are also needed to ensure comfortable mobility for everyone.

In order to **drain water**, it might be essential to install gutters or grilles along the walkway. The opening size of the grille (measured in the direction of movement) should not be larger than ~1.2 cm.

There is no need for guiding lines, if there are long protected sidewalks, which are well demarcated (e.g. by plants). However, the curb should be easily perceptible (rough and emerged surface) and its colour must have a visual contrast to the colour of the surrounding materials. However, it may be necessary to install a guiding line at intersections and junctions. It is necessary to build a warning as a tactile walking surface indicator (TWSI), which differs from country to country.

If there are level crossings, the proper design of surfaces is particularly important for blind and people with partial sight impairments. The areas used by cars and the areas used by passengers should be properly separated by using different country specific TWSI, which provides tactile and visual information.

Last, but not least we should also pay attention to the **plants** near the sidewalks. It is not advisable to plant spiky or poisonous plants, or plants that drop their seeds and leaves, directly next to the path or sidewalk.

Reference to the evaluation matrix: Point 2.4.

II.1.2. Arrival by vehicle

Accessibility by car is an important aspect. It does not matter if the nature trail is located in urban areas or in a natural destination far from inhabited areas, many visitors are expected to arrive by car. If the given area cannot be accessed easily by car, this information has to be shared on various information platforms and on the website of the nature trail as well.

Reference to the evaluation matrix: Points 2.1., 2.2., 2.3., 2.4.

II.1.3. Arrival by public transportation

If the national park or nature trail can be accessed by public transport, it is necessary to make the stops/stations and the waiting areas barrier-free, and use barrier-free vehicles. Although more and more barrier-free vehicles are used (mainly the newly purchased ones) in general, there are still many “not barrier-free” older vehicles as well. Therefore, it might be useful to contact the local public transport service company and inform them on the need of barrier-free vehicles on the given line to the nature trail.

At best, the bus / train stop is located as close as possible to the entrance of the nature trail (preferably within 50.0 m). If there is a pedestrian crossing on the way to reach the destination, there should be a cut in the elevated curb and appropriate TWSI signs should be used (e.g. warning signs with different colour and different surface and guiding line directing to the crossing). Similarly, the location of the stop must be indicated by using warning elements on the ground too. Please note that the design of barrier-free crossings can vary greatly from country to country.

It is advisable to use audible, good visible and legible, and tactile information for timetables, which is easy to find. Blind people often use additional apps to get timetable information, if they are barrier-free. Ticket vending machines, rubbish bins and mailboxes should be approachable without barriers, too. It is important to pay attention to their usability. Therefore, the operating panel or feed channel should not be higher than 85 cm.

If the local conditions allow it, the area of the stop should be flat, with a nearly horizontal paved surface. The area should be indicated by tactile signs with different colours on the ground. Street furniture, ticket vending machines, rubbish bins, plant boxes, mailboxes and traffic signs should not impede the barrier-free use of the paths.

If there is a covered waiting area, it is necessary to provide free space for at least one wheelchair next to the benches. If the walls of the waiting area are made of glass surfaces, it is necessary to put a sticker or other warning sign with visual contrast to each other to ensure its visibility. The colour of benches, seats and handrails should be in visual contrast to the colour of the background. It is important (especially in the case of outdoor benches) to install the seats in a way that water can flow down from their surface. Therefore, it is advisable to design the seats with permeable surface (e.g. with holes on them) and leave appropriate space between the individual seats. Moreover, seats are suggested to be made of vandal-proof and easy-to-clean material. They must be arranged in a way not to impede pedestrians.

The stop must be marked by clearly visible and understandable signs. Good lighting helps safety and orientation. The vegetation should be low around the waiting area because of safety and good visibility.

The area, where people can get on and get off the vehicle, should join to the barrier-free trail. Raising the level of the sidewalk at the stop will make it easier to get on and get off the vehicle. It offers the opportunity for wheelchair users to approach the vehicle directly without using a ramp.

Reference to the evaluation matrix: Points 2.2., 2.4., 2.5.

II.1.4. Arrival by bicycle

As many visitors come by bicycle (impaired guests as well), storing bicycles should be solved in a barrier-free way. In order to ensure easy accessibility of bicycle storage racks, they should be located on the same ground level as the surrounding road surface. In order to protect the accessibility of the storage racks, cars should not be allowed to park too close to them. The storage racks are recommended to be located near the entrance of the destination, since visitors do not want to take extra distances to put their bicycles into the rack. If bicycles are stored in the rack for a longer period, it is recommended to cover it (protection against rain, etc.) and install lighting as well.

Parking facilities for bicycles should be marked in a visible and easily recognisable way (by traffic signs and signs painted on the road). There is an international sign for bicycle parking, which should be used. If the parking facility is established as part of a road used by cars as well, the traffic sign should call the attention of drivers for cyclists and their bicycles.

Parking facilities for bikes should not be located on the main walking route. If it is possible, the bicycle storing racks and the pedestrian area should be well-separated by painting their surfaces with colours in a visual contrast. Thereby, it is easier to notice and perceive that the area of the bicycle racks is not part of the main walking route.

In addition to the “general” city bikes, it is important to mention special bikes as well e.g. cargo bikes, bike trailers and strollers, tricycles for elders, and kids bicycles. Special bicycles have special structures and different wheels, which usually require more space for the user to get on them. It is also important to think about storing solutions for tandem bicycles, which are very popular among visually impaired people. As tandem bicycles are longer, more space is needed to store them safely.

Reference to the evaluation matrix: Points 2.1., 2.2., 2.3., 2.4.

I.2. Destination (Nature trail / National Park / Visitor Centre)

II.2.1. Parking facilities

Concerning the number and the size of barrier-free parking spaces, the relevant national regulations should be taken into consideration. For example, in Hungary, at least one of every 50 parking spots must be designed in a barrier-free way and maximum 4 barrier-free parking spots can be located next to each other.

The accessible parking facilities should be located as close as possible to the destination / entrance (in a reasonable distance). The accessible parking facilities should be located along the barrier-free route. After getting out of the vehicle, wheelchair-users and other impaired people should not move among driving/parking cars.

In general, accessible parking spaces are larger, than regular parking spaces. According to ISO 21542, the minimum width of the parking space for a car should be 3.9 m and the minimum length 5.4 m. This minimum width includes the transfer area beside the car with a minimum of 1.5 m. The surface should be flat and even, with a little incline (max 1.5%) to drain water. Accessible parking spaces should be marked with painting and signs to ensure good visibility and to avoid its unauthorized use. However, the requirements of the accessible parking spaces differ significantly from country to country! Therefore, do not forget to check your national regulations for more information!

Parallel parking (next to the curb) poses many dangers for people with disabilities. If it is not possible to establish perpendicular / angle parking spaces on the road, it is recommended to create special barrier-free areas (like "bus stop turnouts"), closed down from the traffic, where disabled people can safely get in and out of the vehicles. The protected zone should be appropriately wide and its length should be suitable for at least two cars to stop.

If there is no border for separating pedestrian zones from the traffic, traffic diversion barriers (protective columns) must be used and/or tactile detectable strips or curbs with contrasting colour should be applied along the walkway for the safety of blind and visually impaired people.

In order to ensure the accessible use of the ticket machines and other equipment found in the parking area, the interface panels should not be located too high (preferably 0.80 - 1.1 m high from the ground), and appropriately wide free area (enough for a wheelchair to turn around) should be left in front of them. Ticket vending machines are recommended to be located near the barrier-free parking spaces.

Reference to the evaluation matrix: Points 2.1., 2.2., 2.3., 2.4.

II.2.2. Entrance

The most important priorities are to ensure the easy accessibility, clear visibility, proper lighting and safe utilisation of entrances. If the entrance is not clearly visible from the car park, signs and pictograms should be used to help visitors to find it. Using a tactile guiding line to the entrance can also be a good solution. The accessible route from the car park or from the surrounding settlement should lead directly to the barrier-free door / gate / entrance.

The surface of the area in front of the entrance should be flat and even to ensure an easy opening of the door and an uncomplicated manoeuvring with a wheelchair. Information board, including the opening hours and other relevant information, should be located near the handle, on the wall or on the fence. The board should not be located too high! It should be easily readable in a short distance and in a sitting position as well. Accordingly to the requirements of ISO 21542, signs should be placed between 1.2 m and 1.6 m from the floor or ground surface. This requirement should also be applied for the height of boards containing tactile signs, raised or Braille characters. If the position of boards with tactile information is lower, they should be mounted in an angle to the horizontal of 20° to maximum 45°.



Photo: Accessible entrance at Albufera de Valencia, Spain. Nevertheless, it is advisable to add edge protection for the ramp to prevent wheelchair users and 4-wheeled-walkers of going astray and falling down.

Design and size of the entrance door

It is recommended to avoid the utilisation of revolving doors, as they are unsuitable for many of the visitors, for example for families using prams, parents with small children, people using some kind of mobility aids, etc. In addition, the operation of revolving doors is unpredictable for visually impaired and blind people and visitors with learning disabilities. Therefore, only appropriately wide (automatic or ordinary) doors are suitable for barrier-free utilisation. If a revolving door is used, a barrier-free entrance, located nearby, is always needed as well.

The colour of the entrance / gate should be in contrast to the colour of the environment in order to be easily visible from larger distances as well. Easy-to-grip, U-shaped handle makes opening the door easier. The clear opening of the door must be wide enough for a wheelchair user (~ at least 90 cm wide). Free space should be ensured on both sides of the door for manoeuvring (150x150 cm). It is also recommended to avoid using thresholds. The floor should be leveled. *(If there is difference in the level at certain points, the difference cannot not be greater than 2 cm.)* It is recommended to install a mechanical door closer. However, it should be kept in mind that it might be difficult for disabled people to open a door if too much force is required. In this case, alternative door opening systems (such as automatic door opening systems) are recommended.

If the entrance door is glazed, safety glass and security window films should be used. If there are large glass surfaces, it is required to use marking patterns in visual contrast to each other at eye level (upper edge of the glazed panel shall be not less than 1.6 m above the finished floor) and knee-level (not more than 0.6 m above the finished floor) to make the glass perceptible.

If the entrance door / gate is closed most of the time, it is necessary to place a bell / door intercom next to the door. It is recommended to place it on the side of the handle. It should be easily reached from sitting position as well (~0.80 -1.10 m high of the push-buttons).

Reference to the evaluation matrix: Point 3.1.

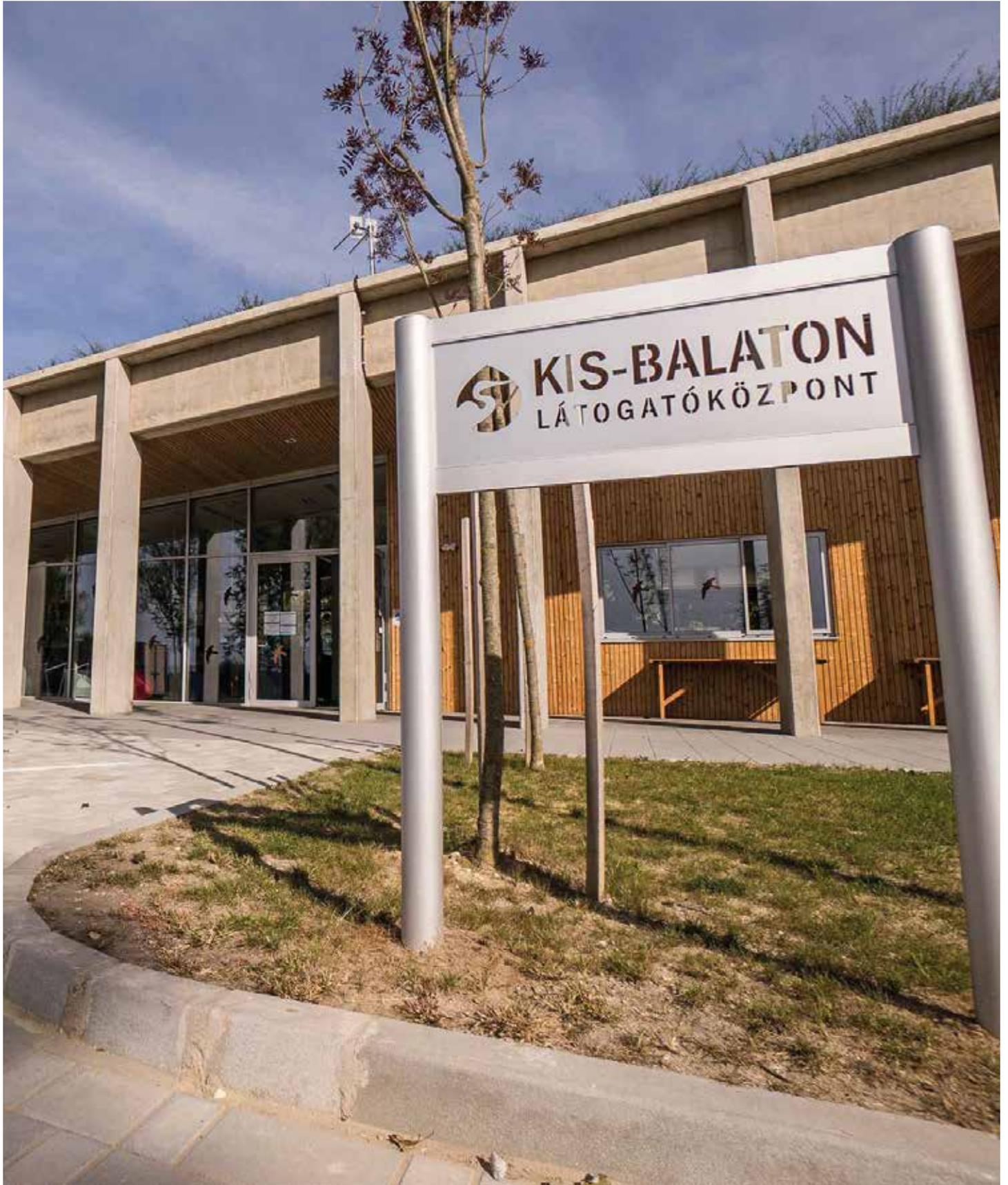


Photo: Main building of the Kis-Balaton Visitor Centre, Hungary.

II.2.3. Main building

In the main building, there are the reception, restrooms, resting points, information boards, rental facilities, souvenir shop, emergency exits (with emergency plans), etc. Visitors can get information, refresh and relax, buy souvenirs, listen to presentations, visit exhibitions, etc.

Level differences of the ground are one of the main obstacles for visitors, when they want to enter a building. Ideally, the level of the external environment and the ground level in the building are the same. If they are not, steps and ramps (as an alternative solution to ensure accessibility) have to be used.

Design of the indoor environment:

A public building, as a building providing some kind of community function, has a characteristic spatial arrangement: the logic of the design can be used as a basic map, when we arrive at an unknown place. Although the design of buildings is different, the logic of the space arrangement is very similar in each building.

In general, we can find the following spaces in every building: the reception area, the central distributive area, from where we can go to different rooms with various functions. This arrangement is especially important for people with disabilities or the elderly, for whom finding the shortest, easiest route is often a basic aspect. Wandering and search around in the building is extremely tiring for them.

In order to be capable of navigating themselves independently in a building, people need information and spatial orientation skills.

Tools, which help impaired people in orientation and mobility:

- for people with reduced mobility: map located nearby the entrance, clear orientating directional signs, pictograms, logical spatial arrangement, use of colours for orientation
- for people with visual impairments: tactile map with high visual contrasting colour located nearby the entrance, logical spatial arrangement, using various colours, high visual contrast and good legible font in an appropriate size for orientation, guiding lines on the floor, tactile information boards next to the doors, audio signals
- for people with hearing impairments: directional signs with easy-to-understand text, light signals (in case of emergency as well), pictograms, logical spatial arrangement, using various colours for orientation
- for people with learning disabilities: directional signs with easy-to-understand text, very easy to understand pictograms, logical spatial arrangement, using various colours for orientation

If we want to provide barrier-free services for visitors, we should ensure the accessibility of the interior space, furniture and the information system too.

At least all visitors will benefit from a well thought wayfinding system (information and guidance system) which gives them support for orientation.

When we choose the material of the floor, we should pay attention to safety aspects. Thereby, it is necessary to choose non-slippery and glare-free flooring options. Depending on the position of the floor materials, used in the building, the slip resistance of floors should be between R9 to R11 (it has to be safe to move on it even if the floor is wet).

Visual contrasting colours of the wall and the floor help the perception of space. A tactile guidance system is not a prerequisite for barrier-free services for blind people. Depending on the structural conditions, it may or may not be installed. In addition, it also depends on how complex a building is and where the barrier-free offers of the exhibition are installed in the building.

Concerning the size of the cloakroom, we should not forget to leave enough space for wheelchair users to freely access it.

Reference to the evaluation matrix: Point 3.1.

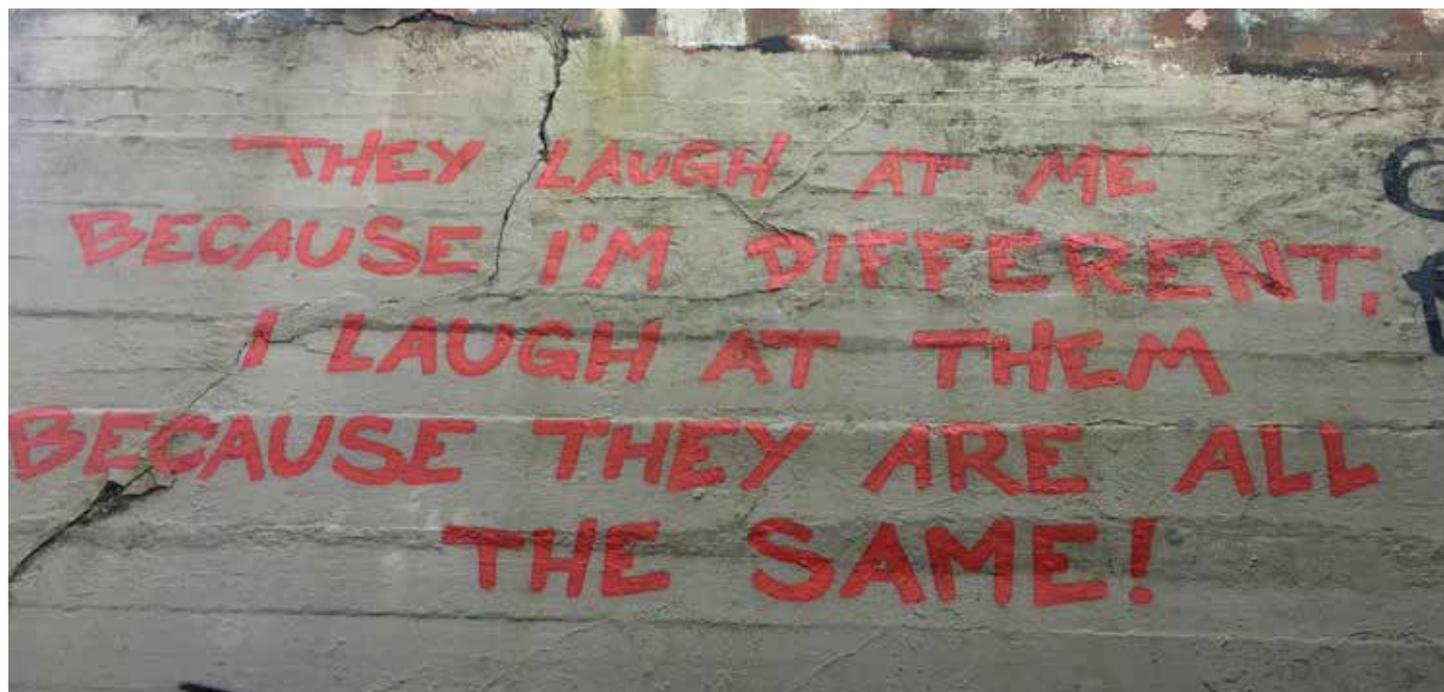


Photo from Schoeneberger Suedgelaende, Berlin, Germany.

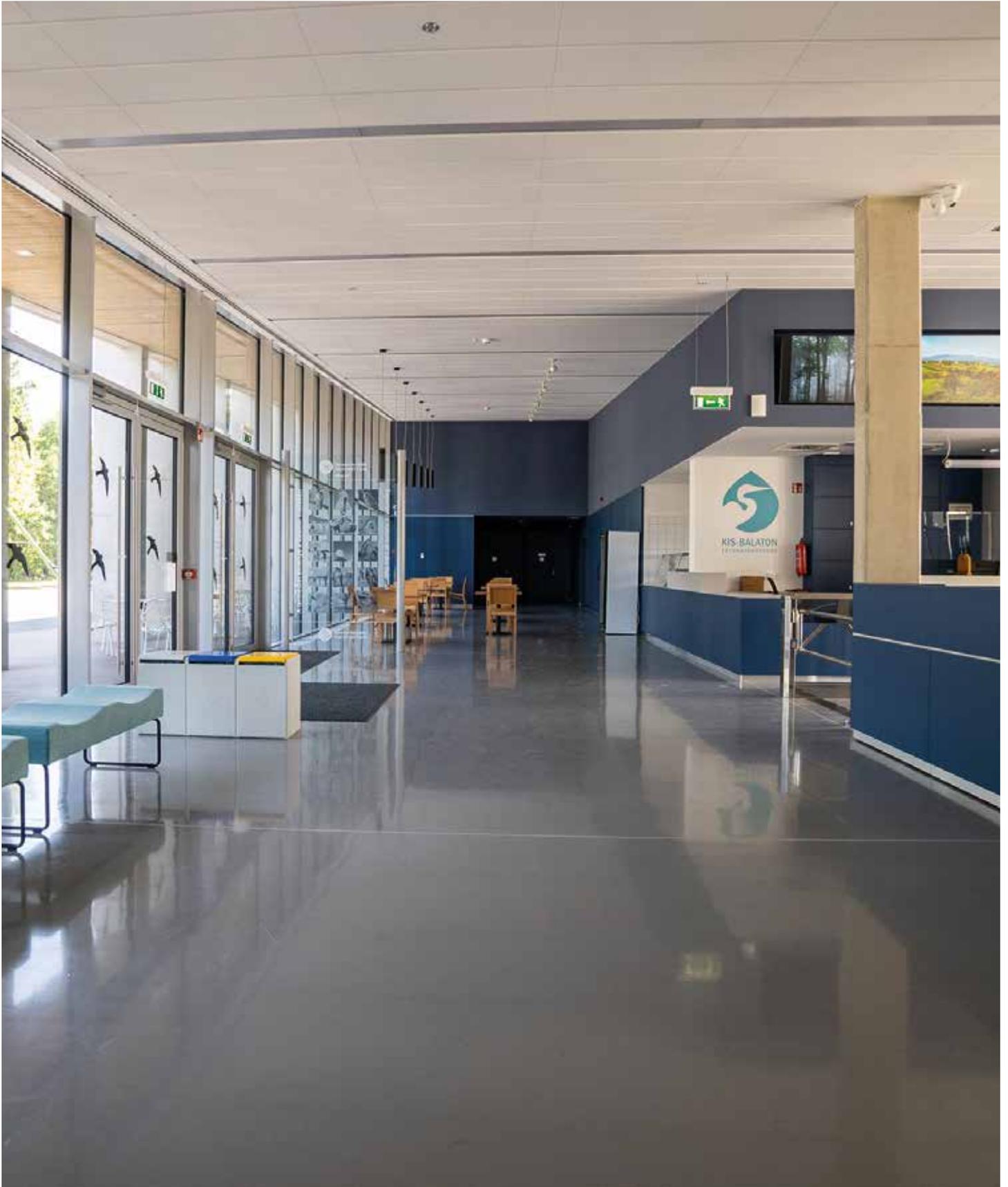


Photo: Reception area at the Kis-Balaton Visitor Centre, Hungary.

II.2.3.1. Reception/Information/Rental

The use of information technology, audio-visual devices and smart phones have brought fundamental improvement in the field of accessibility. Almost all kinds of information is available in advance, both in terms of time and space. However, providing personal information and assistance on site is still essential in public buildings.

The reception / information desk should be easily visible and easily accessible. Reception areas should be located near the main entrance. Tactile guiding lines are required from the entrance to the reception desk, where visitors can ask for information and assistance. We should avoid building stairs and podiums.

The clear width of passing spaces should be wide enough for a wheelchair user. According to ISO 21542, 1.50 m is the measurement needed for a wheelchair user and a walking person to pass. However, passing places are also required to allow a wheelchair user to pass another wheelchair user, a wheel walker or a pram. The dimension of these areas is at least 1.80m by 2,00m. For more information, please check the national requirement in your country!

The information desk should also include a knee-free section with low height, taking into account the lower body size and the needs of wheelchair users. The height, width and depth of the reception desk should be suitable for wheelchair users to freely access it. Accordingly, it is recommended that the desk is at least ~50 cm deep and ~90 cm wide. The clear knee space underneath should be at least ~75 cm from the floor. The height of the counter level should be between 80 cm to 85 cm. In addition, all edges of the counter should be rounded.

It is recommended for help desk employees to sit down at the information desk in order to have the same eye height level as the person in the wheelchair.

If glazing panels are installed at the information desk, the panels should be movable (opening it) to allow direct connection and free conversation, or an induction loop system must be provided.

Proper lighting is very important to ensure even illumination and to facilitate lip-reading. It is recommended to reduce the light reflected off the counter and the light coming from the back of the information desk employee (e.g. light coming from the window in the back), because they cause glare, which makes lip-reading difficult. An outward-facing screen and / or reversible monitor can also provide a great help for disabled people.

If it is possible for visitors to rent audio guides on site, it is advisable to provide the rental services at the information desk.

Reference to the evaluation matrix: Point 3.3.



Photo: It is often forgotten to install a handrail on the inside of doors. It is useful to close the door and to reach the door handle.

II.2.3.2. Toilets

Providing barrier-free toilets for people with impairments is one of the most important preconditions for ensuring the accessibility of a building. As there are significant differences in the national standards in term of barrier-free toilets, please check the requirements in your country to get more precise data on the design. Therefore, in this chapter we will provide only a general description, calling the attention to the main aspects.

Designing a barrier-free toilet is a complex task. Several factors have to be taken into consideration. One of them is the appropriate entry to the toilet. If there is adequate ventilation and proper acoustic doors, there is no need to establish a separated entry/waiting area to the toilets. Barrier-free toilets must be located in the lounge or at the nearby corridor. The toilet should be marked with the internationally accepted “wheelchair” pictogram. The sign should be located outside the toilet, next to the door at general eye level (~ 1.50 m), on the side of the handle.

The door of the toilet should always open outwards. In case of an accident, the wheelchair may impede opening the door. The clear opening of the door should be wide enough for a wheelchair user to enter the door (~at least 0.90 m). It is recommended to avoid using thresholds.

An easy-to-open handle should be installed on the toilet door (approximately at 0.80–1.10 m high from the ground). The door lock should be suitable for people having arm problems. In case of emergency, it should be possible to open the door from the outside as well (reversing lock). It is also recommended to install a mechanical door closer inside the door.

The colour of the casing and the door handle should be in visual contrast to the colour of the background. Non-slippery and glare-free coverage should be installed on the floor. The floor drain must be built at floor level.

There should be enough space (1.50 x 1.50 m) in the toilet for a wheelchair user to turn around and to easily approach the toilet and the washbasin. Moreover, appropriate space must also be provided for impaired people in front of the toilet and at the sides of the toilet to sit down. The height of the toilet should be suitable for a person with mobility impairment to comfortably use it. Elongated toilet bowl should be installed. In addition, foldable and movable grab rails must be provided on the sides of the toilet.

Next to the toilet, toilet brush holder and stainless steel trash can should be installed on the wall. The trash can should be touchless or should be opened by hand.

It is recommended to install easy-to-use single-lever mixer taps or hands-free infrared taps at the washbasins.



Photo: Barrier-free toilet with foldable and movable grab rails.

In addition to the general lighting of the washroom, it is also required to install lighting above the mirror.

It is important to use visually contrasting colours on the floor and the walls in order to facilitate the perception of space. In addition, it is recommended to use different coloured equipment and devices as well. As visually impaired people prefer ordinary washrooms, it is important to use contrasting colours in the design of men and women toilets regarding the tiles, and the surfaces of objects.

Generally, we can see that many aspects have to be taken into account during the design of accessible toilets. As it is very complex task to precisely plan such a narrow space with many detailed country-specific requirements, it is recommended to commission a planning office that is skilled in accessibility.

Reference to the evaluation matrix: Point 3.2.



Photo above: Tables with knee-free space at the Kis-Balaton Visitor Centre, Hungary.

Photo below: Accessible installations in the Kis-Balaton Visitor Centre, Hungary.

II.2.3.3. Installations inside and outside

A sufficient number of seats is required to be provided in larger rooms and corridors, in order for elderly people and visitors with reduced mobility to get rest. Resting places should also be offered for people using wheelchairs. However, it should be kept in mind, that wheelchair users who are having rest should not impede the mobility of other visitors.

Interactive surfaces should be accessible and visible for wheelchair users as well. Computers should be located on tables, which have knee-free space below them, or the height of the tables should be adjustable.

If the exhibited objects can only be seen and examined when visitors would bend close to them, knee-free space should be provided below the cabinets. Excessively deep, horizontal cabinets should be slightly tilted and designed in a knee-free manner as well.

If objects are located in the upper part of the cabinets, it is recommended to place these objects on glass shelves, so they can be clearly seen from the ground.

The lighting used for the illumination of objects in the glass cabinets should possibly not cause dazzling for short stature visitors, wheelchair users and visually impaired people.

It is advantageous to install tilted freestanding information boards in front of the objects, because they do not disturb the view and they can be readable even from standing or sitting position. Special attention should be dedicated to choosing the appropriate height, angular offset and glaze-free lightening. In addition to the scientific descriptions, it is recommended to use easy-to-read texts, which is a great help for children and people with learning disabilities as well.

Lighting is an important tool used in the exhibition rooms. In many cases, the exhibition rooms are dark and only the installed objects get light. Under such lighting conditions, hearing impaired visitors cannot read from the lips nor communicate by signs or by sign interpreter. Therefore, it is recommended to provide additional lighting in a certain area of the exhibition room, which can be switched on and off, when it is needed. If non-portable sound amplification systems (e.g. FM) are used in the building, it is also suggested to install a built-in induction loop amplifier in these areas, e.g. in the exhibition room or auditorium.

Nowadays, more and more exhibitions offer tactile experiences for impaired people. Tactile installations should not be separated from the other objects. At best, they should be designed to be attractive and usable for all visitors. Although visually impaired people move slower and often spend more time to examining the installed objects, the exhibition should be opened and inclusive for everyone. In order to understand the audible information, a quiet environment and good acoustic conditions are required. Similarly, the sound of the exhibition should be directed or accessed via earphones; thereby not disturbing the other visitors in turn. The spatial design of the exhibition should be simple and easy-to-follow. It is recommended to use tactile maps and offer audio guides about the exhibition as well. Wheelchair users should be able to reach and access the installed objects. For visually impaired people, proper, but not dazzling, lighting is very important. In addition, the colour of the installed objects and the colour of their background should be in visual contrast.



Photo: Installed objects in glass cabinets at the National Park Hainich, Germany.



Photo: Tactile installations can be located along the nature trail as well, like at the National Park Hainich, Germany.



Photo: Figures of domestic animals for touching at Tree top path Ivenacker Eichen, Germany.

In the auditorium, there should be barrier-free seating (appropriate spaces for wheelchairs). If it is possible, these spaces should be ensured in various places in the room.

If there is a performance, the face of the speaker should receive enough light without causing glare.

The upper body and face of the sign interpreter should also receive sufficient lights. The wall behind the sign interpreter should be simple and neutral without any disturbing pattern.

Reference to the evaluation matrix: Point 4.



Photo: People taking an excursion in the nature together with a wheelchair user at National Park Schwarzwald, Germany.

II.2.4. Design of nature trails

When we design a nature trail, it is important to define the most relevant aspects for each target group in order to be aware of their special needs. The goal is to ensure that visitors can walk around the area safely.

People with reduced mobility include people with various movement injuries. Their needs and abilities can be very different. However, if we focus on providing accessibility for wheelchair users, generally we can cover all potential needs of people with reduced mobility, that might arise.

For blind and visually impaired people, dangerous areas must be indicated in a tactile or sensible manner in order to avoid accidents. For example, a railing that ends too early can be a danger for them. They also need a tactile and secure guiding line at the edge between nature trail and surrounding material. Obstacles located at head height and holes on the ground are extremely dangerous for them.

For deaf and hard of hearing people, visual information has outstanding importance. In general, audible warning signs are less important in outer spaces (e.g. in the gardens and parks).

People with learning disabilities may get frightened in situations, which are incomprehensible to them. In such situations, they can do completely unexpected things, endangering themselves and other people as well. It is important for them to feel that the environment is safe. It is important to avoid establishing spaces, which are not transparent for them (e.g. long tunnels, narrow corridors).

Reference to the evaluation matrix: Point 4.

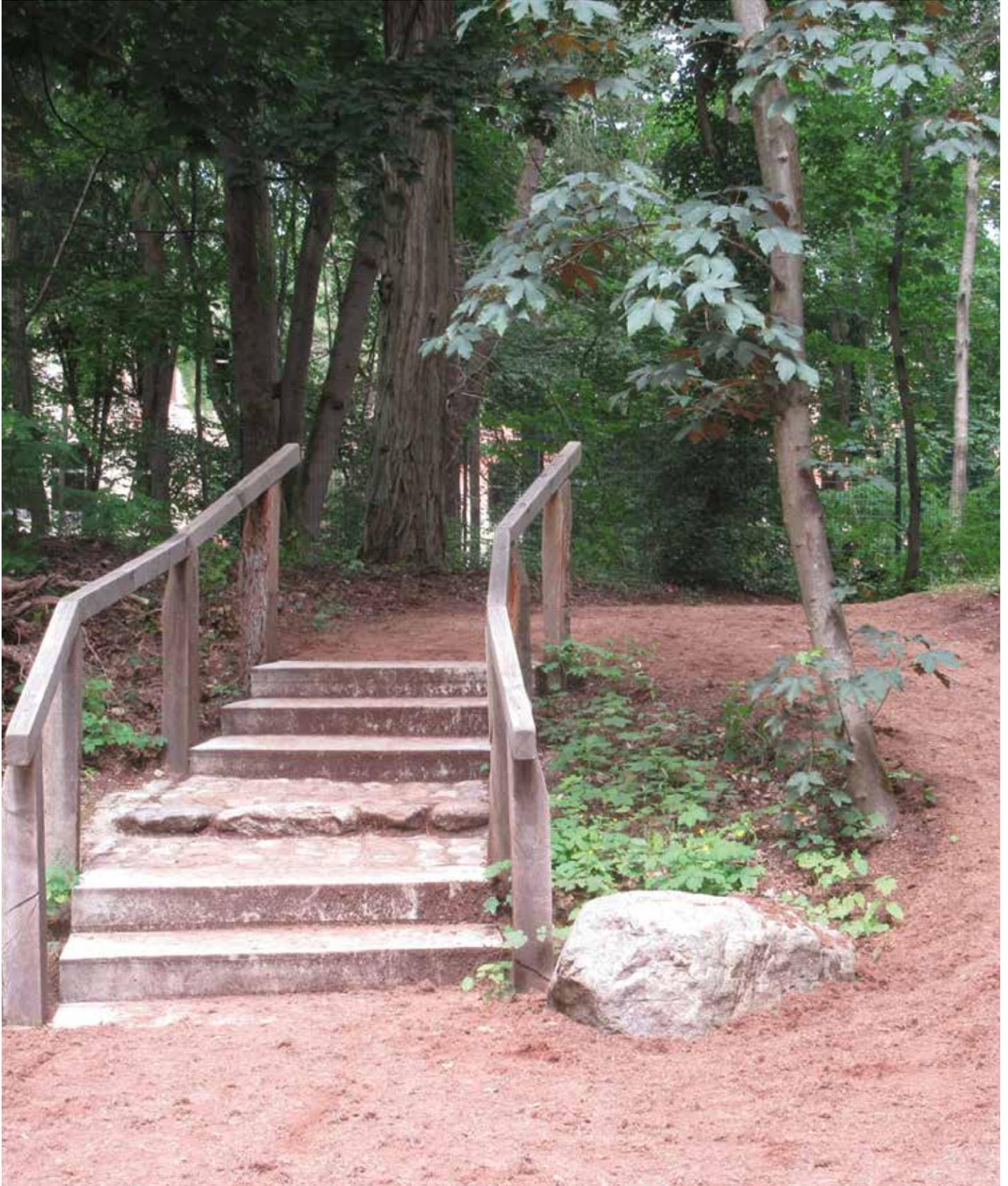


Photo: Proving both stairs and ramp on the nature trail at Beelitz-Heilstaetten, Germany.

II.2.4.1. Connection to the parking facilities, reception area / building

The nature trail or the national park can be enclosed, surrounded by a fence or completely freely accessible.

In some cases, visitors can reach the nature trail directly from the car park or residential area, but in other cases, for example in major nature protection areas, they should go to the main reception building first, through which they can access the nature trail.

The walkways should be connected to the entrances of buildings and other constructed structures. If there is a main / reception building in the area, it is important to be easily accessible by everybody.

The pavement of the nature trail will likely be different from the pavement of the walkway leading to the entrance to the park and to the buildings. Ensuring even surface junction is the main priority. At the connection of walkways and nature trails, there is a change in the pavement. Special attention should be paid to connect the different surface levels.

Reference to the evaluation matrix: Points 4.2., 4.3., 4.4., 4.5.

II.2.4.2. Route of nature trails, stairs and ramps

We perceive spaces in many different ways: through visual, kinaesthetic (exercise-related) and tactile stimuli. The isolation of certain functional elements of the nature trail / national park, or just oppositely the visual connection between them, are factors that shape the spatial system of the environment. In addition to the visual connection, it is important to structure and connect the different functional units by roads and paths. The roads also emphasize the division of free space. They do not form boundaries, but they indicate a certain degree of spatial division and spatial structure. When roads and paths are designed, it is crucial that people with disabilities can use them safely and independently.

If possible, there should be alternative routes as well, which are suitable for walking and for using it by wheelchair, pram or bicycle.

In case of slopes, the paths should follow the level of the slope. Serpentine may be necessary. Thereby, there is no need to install stairs, and the drainage of rain water can also be solved more easily.

If we would like to build ramps, one of the most important tasks is to determine the proper incline of it. However, in order to do so, we have to take various factors into consideration. For example, how high is the staircase, which we want to overcome? How much space is available? Can the person operate the wheelchair on his/her own? Or is the wheelchair pushed by an assistant? Or could electric drive be available?

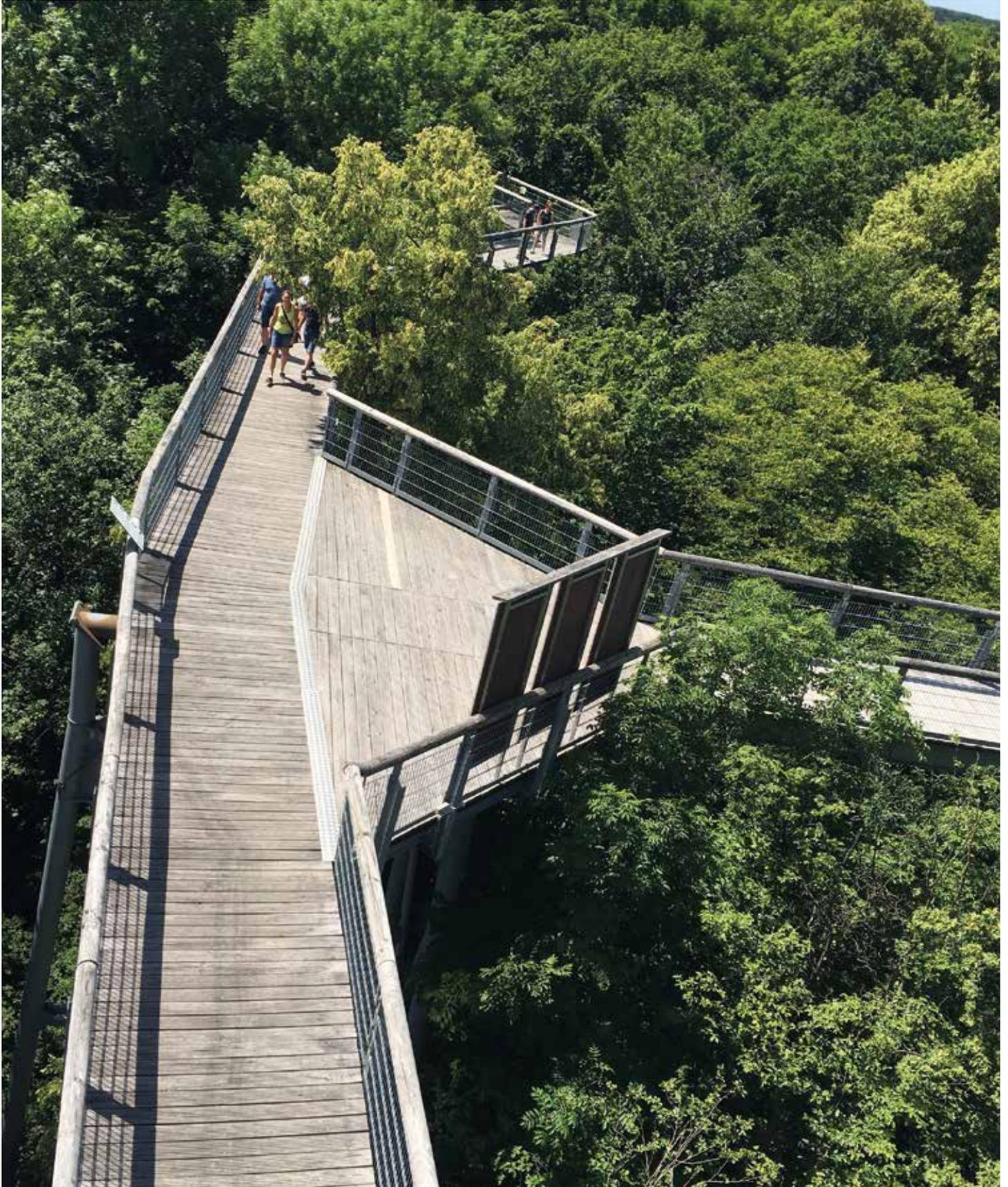


Photo: Tree-top trail at the National Park Hainich, Germany.

Concerning the design of ramps, there are significant differences in the national standards. Therefore, in order to get more detailed information on the width, height, length and incline of the ramp, please check the relevant regulation in your country. Similarly, please check the relevant national requirements for building stairs. Generally, it is recommended to avoid building stairs, but there are cases when stairs cannot be substituted by ramps or other barrier-free solutions. For more information, please check the relevant requirements in your country!

Reference to the evaluation matrix: Points 4.2., 4.3., 4.4.

II.2.4.3. Size and incline of trails

If there is enough space, the width of main trails (used by many visitors) should be suitable for two wheelchair users or for one disabled person and for his/her assistant to move freely next to each other. According to ISO 21542, trails with constant two-way traffic should be at least 1.80 m wide, while trails with frequent two-way traffic should be at least 1.50 m wide, provided that passing places are included at certain intervals.

Trails, which are used by fewer visitors, can be slightly narrower, suitable only for one wheelchair user to freely move on it. Their width should be minimum ~0.90 - 1.20 m depending on how likely people will have to pass each other. However, turning spaces should also always be provided at certain intervals. Please keep in mind, that these requirements can be different in each country. Therefore, please check your national requirements for more detailed information!

According to the regulation in Hungary¹, the longitudinal incline is not recommended to exceed 5%. There should be resting areas after 9.0 m on the slope. The length of the resting area should be at least 1.50 m. Lateral slope of trails, needed for draining water, should not exceed 2%.

Reference to the evaluation matrix: Points 4.2., 4.3., 4.4.

¹ OTÉK 67.§ 3. paragraph

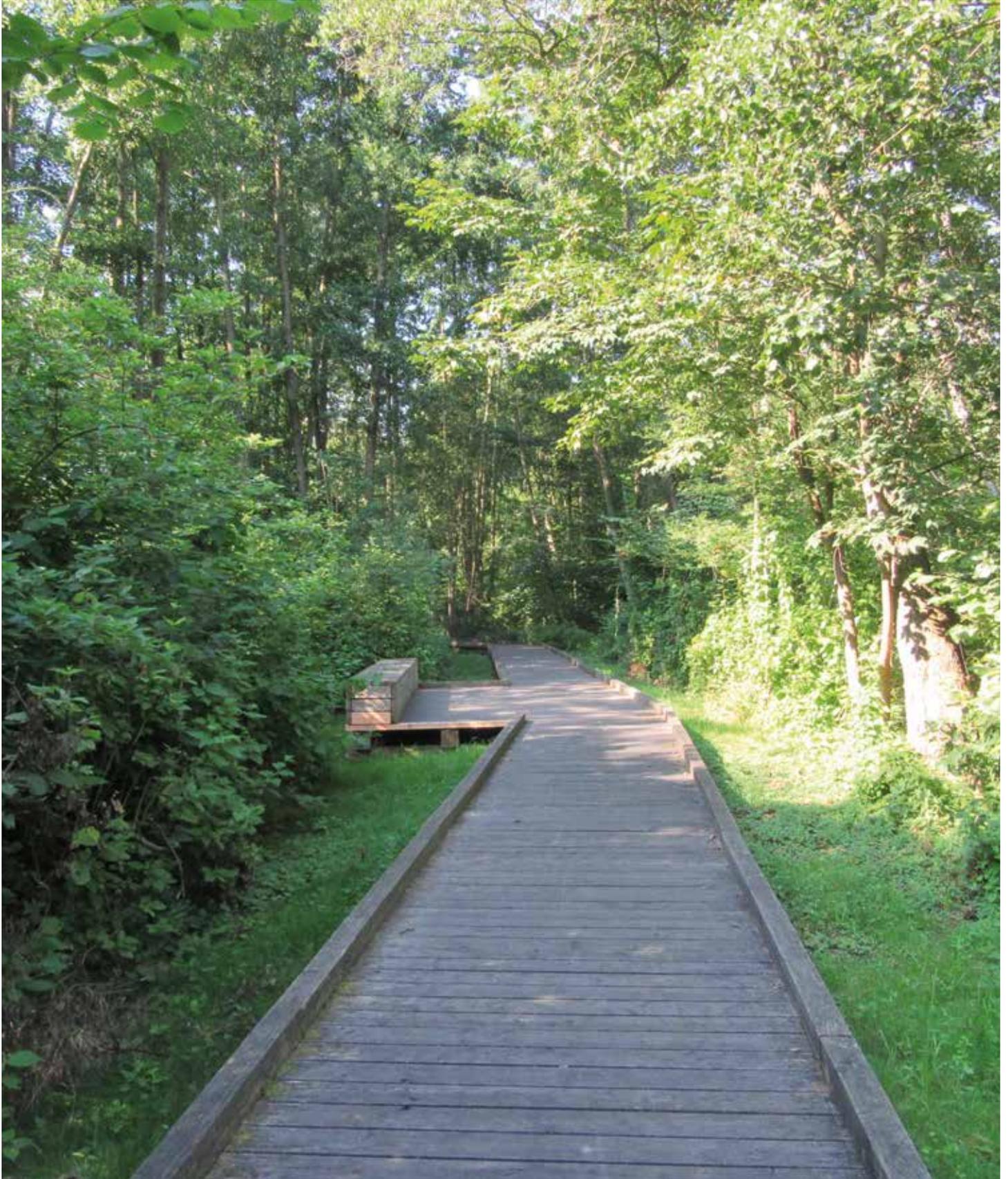


Photo: Edge protection / guiding line along the trails at Naturerlebnis Erlensee, Germany.

II.2.4.4. Surface of trails (covering), drainage, roadsides, raised edges

Regardless of the material used for the pavement, the surface should be **stable** (should not move), **resistant** (should not deform under higher weight or pressure), and **non-slippery** (should be kept clean easily regardless of the weather).

When we choose the material of the pavement, we should take environmental conditions and safety aspects into account as well.

The most typical types of pavements:

- *Concrete poured at the site*: the patterned and structured surface is important to be slip-resistant. It can be dazzling when the sun shines on it.
- *Asphalt*: suitable for colour combinations. It melts at high temperatures. It is cohesive.
- *Stabilized gravel / crushed stone*: has natural appearance. Proper groundwork is required. Water can be directed away easily. However, it is less suitable for wheelchairs.
- *Artificial stone, paving stone (made up of elements)*: large variety of shapes and colours. Good water permeability. It is recommended to use in built environments. Proper structure (order of layers) and compression are important.
- *Brick paving*: large variety of shapes and colours. It is a natural material. It is frost resistant. Proper layering and compression are important.
- *Natural stone paving*: small and large cobble stones and stone blocks. They are suitable for indicating hazardous areas due to their rustic surface. The surface-treated (flamed, slip-resistant) stone blocks can be used by people with reduced mobility as well.
- *Wood paving*: natural material with relatively short lifespan. It is recommended to use it in natural areas, coastal areas and playgrounds.
- *Rubber pavement*: high cost and short lifespan, but large variety of colours. It is recommended to use it in sport fields and playgrounds.

The tactile and visual guidelines, created between the path and the surrounding nature, are important for blind and visually impaired people. In addition, they give clear orientation for other people as well. Guidelines should be easily visible and detectable. Therefore, it is important to make these guidelines from different materials and in different colours, than the other parts of the pavement.



Photo above left: Edge protection / guiding line along the trails at Naturerlebnis Erlensee, Germany.
Photo above right: Wooden paving with raised curb on the trail at Lake Schwerin, Germany.
Photos below: Changes in the pavement.

Changes in the pavement can also mark areas with different functions, e.g. resting areas, sight-seeing spots, etc. For blind and partially sighted people a tactile change in the material of the nature trail can signal different things like the presence of an information point, a bench or a crossroads.

The edges of trails should be made of different colours and materials.

Raised curbs can be used to protect wheelchair users to swerve off the road and to help visually impaired people using the white cane to orient themselves. Properly high curbs are especially important for visually impaired people, when they are moving in narrow, dangerous sections. In certain cases, the vegetation can also act as a border line.

The area near the sides of the road should have different colour and be made from different material than the pavement of the trail to help visually impaired people to stay on the trail. If there is a road near the trail, curbs have to be used. However, there is no need for providing roadside, if there is a vegetation strip between the nature trail and the road.

To ensure drainage is a very important factor. It is essential to lead water away from the road, but it also ensures the stability and long lifespan of the road.

In case of some types of pavement (gravel pavement, dirt road), soil might be washed away in spite of the transversely installed drains / gratings, which can cause the pavement surface to become uneven. This should be prevented by continuous maintenance.

The openings of drains or wooden gratings built into the pavement should not be wider than ~2 cm. (If gratings have longitudinal openings, the openings should be located perpendicular (crosswise) to the direction of movement.) The surface of gratings should be on the same level as the pavement. During winter, snow and ice must be continuously cleared from the pavement.

Reference to the evaluation matrix: Points 4.3., 4.4., 4.5.

II.2.4.5. Routes of different difficulty levels, alternative trails

It is advantageous to establish ring routes (alternative trails), which have different lengths and different levels of difficulty. The characteristics of the trail (level of difficulty, incline, length, etc.) must be indicated on information boards.

It is difficult to determine the optimal length of routes. The length is based on the needs and characteristics of the site.

Reference to the evaluation matrix: Point 4.

II.2.4.6. Intersections

A simple and transparent information and communication system needs to be installed at intersections.

An “information tree” can be a good solution to share various information to the visitors. However, for wheelchair users and people with short stature it is difficult to read the information on the top. Therefore, it would be more favourable to arrange information panels in horizontal manner.

Reference to the evaluation matrix: Points 4.6., 4.7., 6.3.

II.2.4.7. Garden structures, rain sheds and terraces

Regarding garden structures (rain shelters, raised terraces, filagoria), the height of thresholds or difference between the levels cannot exceed 2 cm. In order to bridge level differences, it can be a good solution to cut off the edges of the inclined surfaces slightly (~by 30 degrees).

It is important to provide special attention for shading and rain protection at resting areas. Shading of trails is also important, as it provides protection against strong sunshine. In addition, it contributes to breaking sunlight and to reduce sparkling of objects, thereby improving visual conditions (helps lip-reading, keeping eye-contact and perceiving contrasting colours). If possible, natural shading solutions should be applied (e.g. large plants, trees leaning over the trails). If these solutions are not available, shading objects, pergolas and rain sheds should be established.

Reference to the evaluation matrix: Point 4.1.



Photo: Bridge with bare-foot experience at Beelitz-Heilstaetten, Germany.

II.2.4.8. Bridges and docks

Bridges play an important role to ensure the free mobility of visitors from one side to another or to get over something. In addition, bridges are also good sightseeing points as there is a visual corridor below them.

Several factors should be taken into consideration during the design of bridges. One of the most important aspects is safety. Bridges should be suitable for getting over them safely even by walking or by using a wheelchair. Ideally, the surface of the bridge should be at the same level as the surface of the trail connecting to it on both sides. To protect the safety of people, handrails should be installed (max. ~1.10 m high). Bridges should also have raised curbs (min. ~10 cm high) at the edges to prevent slipping down.

The width of bridges should be the same as the width of the connecting roads, but it is recommended to be wide enough to go through it with a wheelchair comfortably (min. ~1.20 m wide).

Reference to the evaluation matrix: Point 4.3.



Photo: Resting area at the Nationalpark Hainich, Germany.

II.2.4.9. Resting areas

Therefore, resting areas should be established along the nature trails. The resting areas such as benches and side areas, should preferably be built on the same level as the surface of the trail, but they should not be located directly on the pathway for not obstructing others. In the case of a paved surface, the incline must not exceed 2% in either direction. Their width should be at least the same size as the width of the connecting path. The density of resting areas depends on the condition of the terrain too. For example, when people with mobility impairments go up on a long, steep slope, they need to stop and take a rest more often. Tired visitors can sit down and have rest on the benches. It is important to always leave free space next to the benches for wheelchairs or prams.

The colour and the type of the pavement at the resting area should be different from the pavement of the path / trail. Thereby, it is easy to follow the trail and notice the objects nearby.

Reference to the evaluation matrix: Point 4.1.

II.2.4.10. Other objects located near the trails

We can often find objects and other potential barriers along the routes, or near the trail. These objects can be sources of danger for visitors. Some of the objects are easily eliminated, but there are objects that cannot be removed from the trail. In such cases, it is important that these objects should not reduce the usable width of the trail, which is required for free mobility. In addition, these objects should be easily visible, means have a visual contrast to the surrounding, and noticeable by touch with the cane in advance.

Along the nature trails, several objects can be found, for example benches and tables, fountains, garbage bins, railings and handrails.

Benches:

People can sit down and have rest on the benches. Therefore, it is important to locate benches and the resting areas along the nature trail. Benches should be placed next to the trail, but it is important to leave enough space in front of them. Thereby, people sitting on the bench will not impede the mobility of other passengers moving on the trail. In addition, appropriate free space should also be left next to the bench for wheelchairs or prams.

If more benches are located next to each other, it is recommended to place them perpendicularly. Thereby, people with hearing impairments can discuss with each other more easily.

The height of the bench should not be too low and neither too high to enable people to sit down and stand up comfortably. (The seat height should be ~46-48 cm). The width of the bench should be suitable at least for one person (min. ~ 50 cm wide). In addition, it is also advantageous to install armrests as well, which increases the comfortability and safety too. With armrests getting up from the bench is much easier. Benches could also be installed at a low height for children and people with a short stature. Please think also about leaving space for a wheelchair user near the benches.



Photo above: Benches at the Nationalpark Hainich, Germany.

Photo below: Resting area at a nature trail in Denmark, which is accessible for wheelchair users as well.

Tables, raised garden beds:

At the resting areas, it is recommended to install tables as well in front of the benches. Thereby, people can put their stuff on them, they can eat and drink from it, etc. In order to sit comfortably at the table and to use it sitting in a wheelchair, it is important to leave appropriate free space below the table.

The similar aspects should be taken into account, when we design garden beds. It is required to raise them, thereby people sitting in a wheelchair can more easily see the displayed plants. However, appropriate space is required under them to access it freely with a wheelchair. We should also keep in mind that raised garden beds should not be located too high (max. at ~75-80 cm), because people sitting in a wheelchair or people with short stature will not have a clear view of the displayed plants.

Drinking fountains:

There are various types of drinking fountains. Some fountains can be operated by hand, by push-button, by foot, or by pedal. It is very important that the water control button / handle / pedal must be clearly visible and perceptible.

Appropriate free space should be provided for wheelchair users (up to knee-height). It is important that people should be able to access it and get water even if they hold a glass in their hand as well.

In front of the fountains, an appropriately wide, free, horizontal area should be provided (suitable for wheelchair users) to easily access it. The height of the tap should be easily reachable from sitting and standing position as well (~75-90 cm high).

Garbage bins:

It is recommended to locate garbage bins next to the trail. Thereby, they do not decrease the walking area of the trail. The height of garbage bins should be easily reachable from sitting and standing position as well (~75-90 cm high). In front of the garbage bins, an appropriately wide and free area should be provided (suitable for wheelchair users) to easily access it.

Guardrails, railings, handrails:

The guardrails / railings can be used to border a road section if the footpath is significantly higher (more than ~60 cm) than the surrounding terrain or if ground characteristics are dangerous. The height of the guardrails should be at waist height (~1.00 m); thereby they do not obstruct the view of children or wheelchair users. The guardrails make traffic safer and easier, but they also form borders and indicate direction. However, keep in mind that providing tactile guiding edge is still required for blind and visually impaired people. Also a low height difference could be dangerous for them.

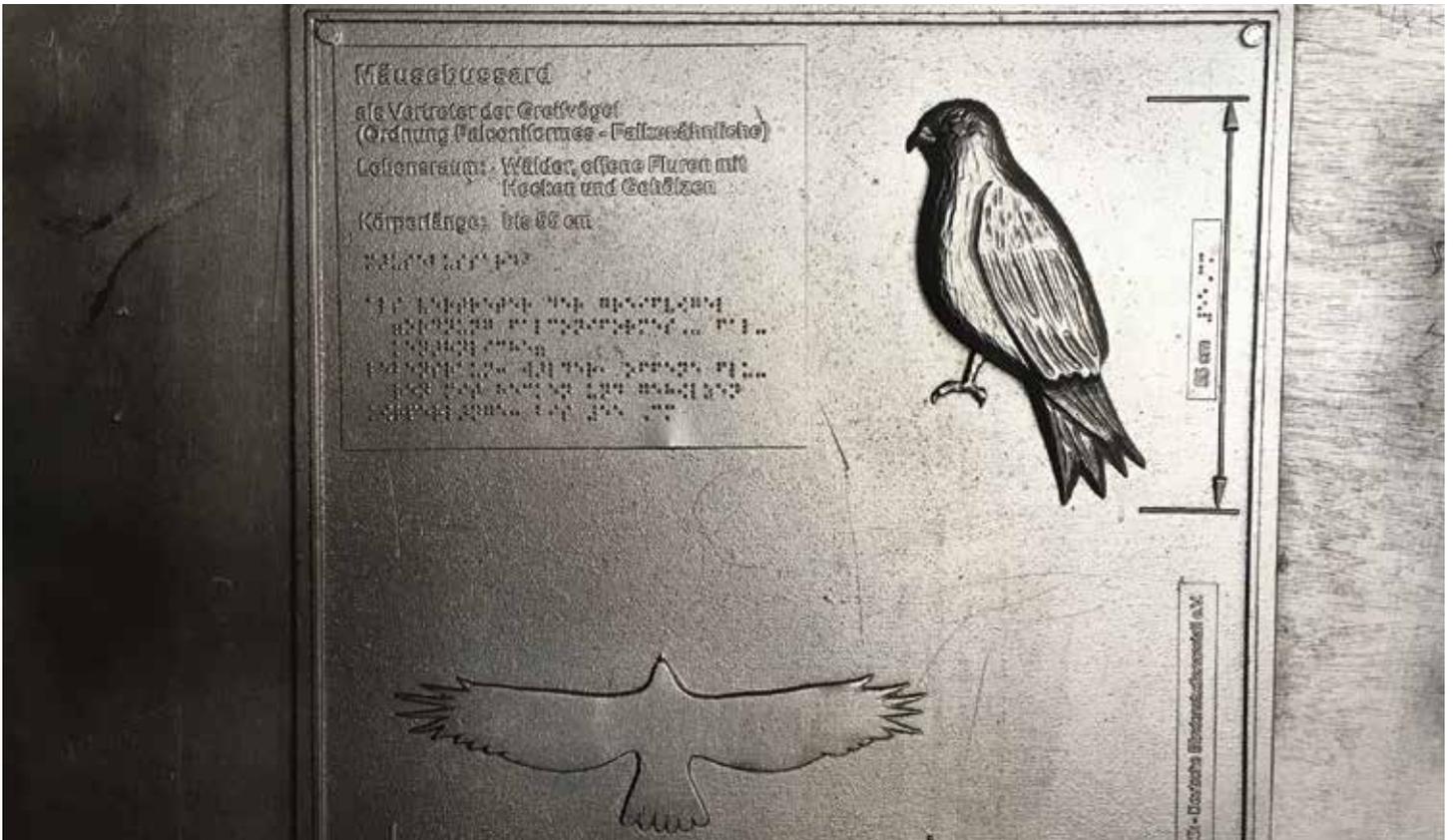


Photo above: Tactile map at Naturerlebnis Erlensee, Germany.

Photo below: Tactile information board at Naturerlebnis Erlensee, Germany.

Handrails are recommended to be installed along ramps, stairs, but also at long corridors. Handrails indicate the direction of movement. They help people with limited mobility to grab them and pull themselves up on sloping / hilly areas. They are important especially for elderly people, who use sticks and crutches for mobility. Handrails should have a smooth surface and they should be continuous. They should have overhangs at the end of ramps and stairs. They should have circular shapes or rounded edges, so they do not injure hands. They should be firmly fixed, but appropriate space should be left from the wall for the fingers (~5.0 cm). It is advantageous to use double height handrails, because they can be used comfortably even by people walking on their foot and people with short stature or children (one handrail at ~70 cm and the other is at ~95 cm high). Their colour of handrails should be in contrast to the colour of their environment in order to be easily noticeable.

Information boards, signs:

Information boards and signs provide great help for all visitors. They can get information about the nature trail, the protected plant and animal species, and the entire ecosystem of the area. In addition, the boards and signs help in orientation as well.

It is important that the system of information boards and signs is clearly understandable and consistent. The information should be accessible for blind and visually impaired people as well. Therefore, the information should be shared in a tactile or even audible form as well. The location of information boards should be indicated for visually impaired people for example by using different pavement / signs on the ground.

The information written on the boards should be short, concise, and easy to understand. Clear and easy to understand pictograms are beneficial for people with learning disabilities as they help them to understand the information. In addition, they can be easily interpreted by foreigners as well.

The most important information, that are recommended to be shared on the information boards:

- Name of the trail.
- Length of the route.
- Width of the trail, including the narrowest width as well.
- Characteristics of the trail, level differences, types of pavements.
Number and location of possible obstacles (barriers).
- Attractions along the trail.
- Services available along the trail (e.g. resting areas, toilets, rain sheds, etc.).

The key information should be presented in simple, easy-to-understand language as well.

Reference to the evaluation matrix: Points 4.1., 4.3., 4.6., 4.7.

ANNEX: Specific national standards, recommendations and regulations

Annex 1. Germany

In Germany, the standard DIN 18040 is the basis for barrier free design. Regarding barrier free nature experience, there are two relevant standards, namely:

- **DIN 18040-1 for Construction of accessible buildings – Design principles / Part 1 Publicly accessible buildings** (concentrating on construction aspects like parking, room design, toilets etc.)
- **DIN 18040-3 for Construction of accessible buildings – Design principles / Part 3 Public circulation areas and open spaces** (concentrating on informational aspects like traffic markings, orientation, passenger information etc.)

This standard aims at accessibility of facilities, so that they are accessible to people with disabilities without outside help. The standard describes the technical requirements under which structural facilities are barrier-free. In particular, it takes into account the needs of people with visual impairments and blindness, hearing impairment (deaf, deaf and hard of hearing) or motor disabilities and people who use mobility aids and wheelchairs. Also for other groups of people, such as large or small people, people with cognitive disabilities, elderly people, children and people with prams or luggage, some requirements of this standard lead to a facilitation of use. Special attention was paid to the involvement of affected people and the implementation of their experience in constructional requirements.

Legally, the DIN standards in Germany are mainly recommendations, which do not have to be applied on a mandatory basis. However, most of the state authorities had made stipulations in their building codes that require compliance with accessibility standards for public accessible buildings or facilities. Different regulations can be made depending on the federal state. Currently, the standards mentioned above have been introduced in almost all federal states in large parts as technical building regulations.

Other standards for accessibility in Germany, which represent the state of the art, and are normally applied if accessibility and the topic of the standard has to be realized, are:

DIN 32975:2009-12: Designing visual information in the public area for accessible use,

DIN 32984:2020-12: Tactile walking surface indicators in public areas

DIN 32986:2019-06: Tactile lettering and labelling- Requirements on the presentation and application of Braille and raised lettering

DIN EN 81-70: Safety rules for construction of lifts

Certification of barrier free destinations in Germany

Besides of the official DIN-standards, there is a project for certification of barrier free destinations "Travel for All" (German: Reisen für Alle). The main aim of this approach is the support of barrier free tourism in Germany. The nationwide "Travel for All" certification system is based on extensive criteria to ensure high cross-industry quality standards. These have been developed jointly by associations of different disabilities and tourism associations. „Travel for All“ is an information and evaluation system, which is based on the standards, that enables guests to independently assess the suitability of the offer for their needs. Guests can thus check the usability and experienceability of tourism offers on the basis of reliable detailed information in the run-up to the trip and select and book the offers that are suitable for them. Among the categories, there are hotels, restaurants, excursions, recreation and sport etc. The offers are being certified on respective user groups (e.g. people with learning difficulties, people with hearing impairments etc.).

Annex 2. Austria

Each person with disabilities has individual needs. Because of that, standards just cover the minimal requirements and have to be adapted if necessary. In general, norms are only recommendations. If they are implemented in building regulations of the Austrian provinces, they are legally binding. ÖNORMs are published by the Austrian Standards International (ASI) and updated regularly.

Standards for building accessible buildings and other constructions are the followings:

- ÖNORM B 1600 (original version 1977): barrier free construction – Base for planning (pavements, ramps, entrance areas, doors...).
- The following three ÖNORMs have to be used together with the ÖNORM B 1600:
 - ÖNORM B 1601: Special buildings for disabled and elderly people: Base for planning.
 - ÖNORM B 1602: Barrier free schools and education infrastructure.
 - ÖNORM B 1603: Base for planning for barrier free tourism infrastructure.
- There are many more norms for accessibility, among others:
 - ÖNORM EN 81-70: "Safety rules for construction of lifts".
 - ÖNORM V 2102: "Tactile floor information – technical help for blind and visually impaired people".
 - ÖNORM A 3011, part 3: "Graphic symbols for public information".
 - ÖNORM A 3012: "Visual guiding systems for public information".

Nowadays, the building regulations of the provinces do not use the ÖNORM B 1600 anymore. Instead, they use the OIB guideline 4 (User safety and accessibility)¹.

Protection against discrimination in the daily life is regulated in the federal law of equality for handicapped people. There are no detailed descriptions for the design of accessibility. These regulations can mainly be found in building regulations and traffic regulation laws.

Norms and guidelines are important for accessibility. In general, they are only recommendations (they are not legally binding). Nevertheless, they are often implemented in building regulations and therefore legally binding. It is also common to implement norms and guidelines in contracts (for planning or building services). If there are legal disputes, guidelines and norms are often used as interpretation aid.

The most important norm in the field of accessibility is the ÖNORM B 1600, which defines “Bases for planning for barrier-free construction” (i.e. pavements, ramps....). The “special” norms ÖNORM B 1601 to B 1603 are to be used in connection with it. They provide a basis for planning barrier-free health facilities, barrier-free living and working facilities, barrier-free education infrastructure and basis for planning barrier-free tourism and leisure facilities. On provincial level, the OIB - Österreichisches Institut für Bautechnik (*Austrian institute for construction techniques*) has an important role in harmonizing the constructional regulations.

Moreover, RVS - Richtlinien und Vorschriften für das Straßenwesen (*guidelines and regulations for street infrastructure*) and the RVE - Richtlinien und Vorschriften für das Eisenbahnwesen (*guidelines and regulations for train infrastructure*) are also important guidelines.

Norms can be ordered at the Österreichische Normungsinstitut (*Austrian norm institute*) and guidelines on traffic at the Österreichische Forschungsgesellschaft Straße Schiene Verkehr (*Austrian science society Road Rail Traffic*), both for a fee. The most important information about barrier-free building and constructing can be found in the brochure “Handbuch Barrierefrei“ published by the Ministry of social affairs.²

Annex 3. Hungary

In Hungary, accessibility is regulated basically by three key legal acts: two laws and a government decree. In addition, there are other relevant legal documents: legislation, regulations and recommendations related to road infrastructure, health and fire protection.

- **Act no. LXXVIII of 1997 on the Development and Protection of the Built Environment**-amended several times (Building Act).
The Act defines the concept of accessibility and the concept of public buildings. It also determines the general requirements for constructions, including the requirements for accessibility as well. It stipulates that accessibility aspects should be taken into account and should

1 Information on the building standards are translated from: <https://www.oib.or.at/en/oib-guidelines>

2 Information is translated from:

https://www.sozialministeriumservice.at/Downloads/sms_handbuch_barrierefrei_wohnen.pdf

be validated during the design and construction of new public building, or during the renovation of already existing buildings (Section 31 General requirements for buildings).³

- **Act no. XXVI of 1998 on assuring equal opportunity for people with disabilities**

According to the Act, public institutions must be barrier-free. The Act basically focuses on buildings maintained by the state and the municipalities.⁴

- **Decree no. 253 of 1997 (XII.20.) of the Government on national urban development and building requirements** (“OTÉK”), and the decree no. 182 of 2008 (VII.14.) on the amendment of it.⁵

The amendment of the government decree in 2008 introduced significant modifications in terms of accessibility (regarding the content and comprehensibility).

It contains specific requirements for the needs of people with reduced mobility. Regarding the other disability groups, it contains general requirements.

However, the planning program required by OTÉK provides opportunity and obligation to clarify many issues.

It provides opportunity for differentiation. In the case of existing buildings, it also allows partial accessibility. However, there is no room for concessions when new buildings are planned and constructed.

The OTÉK contains provisions on accessibility according to the following chapters:

- accessibility of green spaces and buildings, parking of vehicles.
- floors, hatchways, windows, glass walls, emergency exits.
- general requirement for connecting level differences: stairs, slopes, stairs with rest, slopes with rest, handrails, fences.
- elevators, escalators, moving walkways.
- size and design of rooms, including passageways, corridors, rest rooms and toilets.
- general requirements for individually used building units.
- existing buildings.
- conditions for deviating from certain requirements.

The **international standard ISO / FDIS 21542:2011** is not obligatory to be applied in Hungary, but it provides help and support for planning. It contains mandatory elements for some EU investments.

In addition, the recommendations of organisations and associations helping people with disabilities are also very useful for planning:

- o For example, the resolutions regarding the application of tools and systems encouraging barrier-free physical and info-communication environment for people with visual impairments (application of tactile signals, design of audible lights, texts in Braille), developed by the accessibility experts of the Hungarian Federation of the Blind and Partially Sighted (Magyar Vakok és Gyengénlátók Országos Szövetsége - MVGYOSZ).

3 <https://net.jogtar.hu/jogszabaly?docid=99700078.tv>

4 <https://net.jogtar.hu/jogszabaly?docid=99800026.tv>

5 <https://net.jogtar.hu/jogszabaly?docid=A0800182.KOR&txtreferer=99700253.KOR>

Annex 4. Poland

Constitution of Poland declares equality before the law, demands equal treatment by the public authorities, and forbids any form of discrimination (Article 32). It offers legal protection and self-determination of everybody's private life (Art. 47), and protection of health (Art. 63). It obligates to assure help in daily life, work assignment or social communication (Art 69).

Parliament Acts, as well as governmental decrees regulate the details of norms and procedures that are legally binding. Some standards proposed by non-authorities may be considered good practice rather than obligation.

Legislation related to disability, barriers or accessibility is represented in legal documents, regulating different sectors of life. These issues are included in the Parliament Acts on education, road construction and traffic, construction of buildings and their surroundings, rehabilitation and employment of disabled, health etc. There is also a lower Parliament Act: *Charter of Laws of Disabled Persons (Karta Praw Osób Niepełnosprawnych)* that summarizes the basic laws for decent living, free of discrimination. It defines ten specific laws, in the most important areas.⁶

Parliament Acts usually give general directions and their implementation is based on the Government Decrees (or Regulations), which define standards or provide procedures and rules.

For example, *The Construction Act* of The Parliament is implemented via *Decree of the Ministry of Infrastructure on the technical conditions of the buildings and their location*. It defines detailed conditions for all users, but includes needs of disabled people.

The *Road Traffic Act* and connected regulations define some aspects of accessibility that are related to our topic, including parameters of parking lots for disabled users.

These regulations are perfectly summarized and presented with help of excellent infographics in the *Manual for barrier-free planning*, issued by the Association of the Friends of Integration. Some other compendiums have been prepared by associations of or working for disabled people, often commissioned by related administrative bodies like the Ministry of Infrastructure or Railway Transport Office.⁷

Some of these standards may, to some extent, be applied in the outdoor conditions in natural areas. There were some attempts to standardize the barrier-free solutions in tourism, however these were not finalized neither as voluntary nor legislative standards. Anyway, their focus is on general issues, common for any kind of tourism - like travel, parking lots, hotels, information services, and not on nature experience as such.

⁶ Uchwała Sejmu Rzeczypospolitej Polskiej z dnia 1 sierpnia 1997 r. Karta Praw Osób Niepełnosprawnych (M.P. z 13.08.1997 r. Nr 50 poz. 475)

⁷ Fundacja Laboratorium Architektury 60+ skład zespołu: Benek I., Labus A., Kampka M. (red.) "Wytyczne w zakresie projektowania uniwersalnego mając na uwadze potrzeby osób niepełnosprawnych" – ekspertyza wykonana na zlecenie Ministerstwa Infrastruktury i Budownictwa, Warszawa, 2016

Wysocki M., Załuski D. Ekspertyza w zakresie dostępności kolejowych obiektów obsługi podróżnych z niepełnosprawnościami oraz ograniczoną możliwością poruszania" – ekspertyza opracowana na zlecenie UTK, Warszawa, 2017

Accessibility of nature has been addressed by a handful of implementations, some set up by National Parks. In most cases, the target group was people with mobility restrictions, though some attempts to support visually impaired have also been made. However, no standard has been agreed so far.

Another voluntary standard regulates the barrier free websites, portals and apps. The certificates are issued by an NGO consortium, after auditing by experts and testing by disabled. The certificate is based on the worldwide accessibility standard WCAG 2.0 (Web Content Accessibility Guidelines - Polish: *Wytyczne dotyczące dostępności treści internetowych*).⁸

An interesting standard has been prepared by Polski Związek Niewidomych (Polish Blind Union), on designing of public space for blind and visually impaired people.⁹

The *Parliament act on sign language and other communication methods* sets up a standard in the communication.¹⁰

Some parliament and lower acts regulate questions of jobs and social rehabilitation, including sport of the disabled people, financial support or details such as the guiding dogs and their special status in nature conservation areas, parking permits, libraries for blind people, adaptations for barrier free railway, etc.

Few cities developed their integration/inclusive strategies (local regulations).

New strategy for inclusion for 2020-2030 is being processed.

8 See <https://www.gov.pl/web/gov/niepelnosprawni-portal-informacyjny> or <http://www.niepelnosprawni.pl>

9 Polski Związek Niewidomych, Instytut Tyflogiczny, "Projektowanie i adaptacja przestrzeni publicznej do potrzeb osób niewidomych i słabowidzących – zalecenia i przepisy", Warszawa 2016

10 Dz.U.2017.0.1824 t.j. - Ustawa z dnia 19 sierpnia 2011 r. o języku migowym i innych środkach komunikowania się.

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