# MODIFICATIONS IN DISABLED ACCESS REQUIREMENTS

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**Abstract**
Wheelchair access allows disabled people to visit places that would normally be inaccessible to them. This includes overcoming stairs, uneven terrain and other obstacles. In the context of the new Building Act, the issue of barrier-free use is formulated in the new concept of accessibility. This has a broader meaning and has become one of the seven basic requirements for buildings. It is intended to ensure that not only buildings but also land can be used safely by all people of all ages and in all life circumstances. This means not only wheelchair users, but also mothers with small children, the elderly or the infirm. The article also looks at the possibilities of using natural sites for recreation for these people.

**Key words:** accessibility, wheelchair access, access to forest, parameters of roads

## Introduction

Getting out into nature to recharge is relatively easy for the general population. For a person in a wheelchair, who has to face architectural barriers in particular, a seemingly banal walk can be a challenging event with many difficult circumstances. Complications can include the transport to the site itself, difficult terrain with unpredictable unevenness of the surface of the nature trails, inappropriately placed barriers, information boards or the absence of accessible sanitary facilities.
As stated by Zdařilová (2024), the term barrier-free has been adopted in building practice, which is often understood as an adaptation and technical measure to ensure the movement of wheelchair users. It is far more apt to work with the term accessible environment, which in itself conjures up the idea of a welcoming environment for everyone, regardless of age or disability. In this way, we can prevent further new barriers that prevent the full use of public spaces, buildings and even the interior itself.
Accessibility is one of the basic requirements for buildings according to the provisions of the Building Act No. 283/2021 Coll., Section 145(1)(e). Detailed requirements for accessibility are laid down in Decree No. 146/2024 Coll., on requirements for construction, which refers to the new binding standard ČSN 73 4001 Accessibility and barrier-free use in Section 29(1).
The new Building Act includes a requirement for accessibility of buildings, but also for public spaces - pavements, public transport platforms, level and off-level crossings, pavements in gardens and parks. If attention is paid to pedestrian routes, these requirements can also be applied to places of tourist interest, which should be made accessible to wheelchair users. This standard is therefore not binding for the forest or the natural environment, but should be used as a basis for designing paths, routes or recreational environments for all.

## Materials and methods

Creating and adapting hiking trails to meet the needs of people with reduced mobility is essential. This includes paved surfaces, gentle gradients and sufficient width of paths.
A path width of at least 0.9 m is sufficient for wheelchair passage. If a wheelchair user and a pedestrian are to pass each other on the path, or if it is necessary for the wheelchair user to be able to turn around, the width should be extended to a minimum of 1.5 m. If two wheelchair users are to be able to pass each other comfortably, it is recommended to allow for a widening of 1.8 m. The smallest space required to turn a wheelchair 90° to 180° is a rectangular area of 1.2 × 1.5 m. If the wheelchair user is to make a turning movement of more than 180°, a circular handling area of at least 1.5 m in diameter must be provided. For this reason, footpaths and walking routes should have a minimum width of 1.5 m, ideally 2 m. All elements such as benches, information boards or other obstacles must be placed so that a clear passage along the natural guide line of at least 1.5 m width is maintained. In exceptional and justified cases, this space may be temporarily narrowed to a minimum of 0.9 m.
The maximum height difference that can be safely overcome by the wheelchair user without further adjustment is 20 mm. In addition, the following general requirements must be complied with in terms of accessibility:

The maximum longitudinal slope of the paths should not exceed a ratio of 1:12 (8.33%). For short ramps up to 3 metres in length, a slope of up to 1:8 (12.5%) is permissible. The transverse slope should not exceed 1:50 (2 %). For bridge structures, a maximum longitudinal slope of 1:40 (2.5%) is recommended. Rest areas should be provided on routes with a longitudinal slope exceeding 1:20 (5.0%) and a length greater than 200 metres. These should be at least 1500 mm long, with a slope in one direction only and a maximum of 1:50 (2 %).
In justified cases, particularly where the existing condition or rugged terrain does not allow it, higher gradients may be designed, but always taking into account safety and usability for persons with reduced mobility (standard ČSN 73 4001, 2024).
If the slope is greater than 1:6, for example at bridge approaches or footbridges, it can be very dangerous for wheelchair users. There is a risk of unintentionally sliding out of the wheelchair or even tipping over when going down. Conversely, when going up a steep incline, there is a real risk of the wheelchair tipping backwards. It is usually not possible to safely negotiate such an incline without assistance (Filipiová, 2002).
The surface of hiking trails should blend in appropriately with the natural environment. It should be firm, flat and stable, free of holes and potholes. It must not be slippery. However, unpaved or unpaved surfaces are not entirely suitable for wheelchair users, especially in difficult conditions such as spring thaws or prolonged rains. Roots, loose stones, mud or sand, for example, are also a problem.
In the vicinity of watercourses, the use of paved surfaces is preferred. The choice of the specific material depends on the environment and the use of the route. For example, close to nature surfaces are suitable, but also asphalt or concrete.
Of the unconsolidated construction layers, only mechanically consolidated aggregate with a maximum fraction of 32 mm can be recommended. Surfaces with a larger fraction, for example 63 mm, are not suitable for safe and comfortable movement due to the width of tyres and the small wheel diameter of wheelchairs or other non-motorised vehicles (Hrůza, 2015).
For the movement of wheelchair users, it is recommended to pave the road with compacted asphalt layers. Alternatively, concrete paving with minimal joints can also be used, however, consideration should be given to whether its appearance and character fits in with the particular natural environment.
In terms of flatness, risk of slipping, comfort during movement, functionality and durability, asphalt (bitumen) surfaces are among the most suitable solutions. Quality types of asphalt surfacing include asphalt concrete, coated aggregate or asphalt carpet.
For existing paths, a surface consisting of penetrating macadam is often found. However, this is one of the least suitable bituminous covers for barrier-free use. Its composition is based on coarse-grained aggregates (fraction 0-32 mm or up to 64 mm), which creates a significantly coarser and rougher surface that reduces comfort and safety of movement for wheelchair users (Juško, 2015).
There should be no obstructions on the paths, such as crickets or depressions used for drainage, as they present a barrier to wheelchair users.
In places with waterlogged terrain or where access is otherwise difficult or vegetation is at risk of damage from trampling, wooden boardwalks can be designed. These walkways consist of a walking surface made up of timbers, longitudinally sawn logs or planks that are attached to longitudinal beams across the direction of travel. It is advisable to leave gaps of at least 10 mm between the elements to allow water to drain from the surface. It is advisable to install wooden or steel slats at least 60 mm high at the edges of the pavement to prevent unintentional slipping or falling from the pavement, see Fig. 1 and 2. However, it should be taken into account that wood can be very slippery after rain or in foggy weather, which reduces the safety of the passage.

Fig. 1: Poval pavement without edge barrier

Fig. 2: Poval walkway with guide rail

Dedicated parking spaces for wheelchair users should be located as close as possible to access routes to ensure easy and safe access to sites. The width of a perpendicular or angled parking space is 3.5 m. Two perpendicular and inclined bays may share a common handling area. These reserved parking spaces shall be at least 2500 mm wide. The handling area shall be at least 1200 mm wide, see Fig. 3. Longitudinal parking bays of 7 metres in length should be provided for vehicles fitted with ramps to allow for more convenient entry and exit (CSN 73 4001, 2024).

Fig. 3: Two parking spaces with shared parking area

The availability of accessible toilets near the entrance points to protected areas, nature trails or just at car parks in popular tourist locations is essential to enable people with reduced mobility to visit these areas. In practice, there are already many examples of how these toilets can be suitably and functionally designed. To ensure accessibility for wheelchair users, the following dimensional parameters need to be met:

In every toilet area intended for public use, there must be at least one accessible toilet cubicle with the possibility of using assistance, which can be accessed from a common area for women and men. The toilet cubicle shall have dimensions of at least 2200 x 2200 mm., and the toilet bowl shall be fitted so that there is a handling space of at least 900 mm on both sides of the bowl. If this is not possible, there shall be at least one accessible toilet cubicle for separate use in the women's ward and at least one in the men's ward. The single-user toilet cubicle shall be at least 1800 mm wide and 2200 mm deep.

Relaxation areas and nature trails

Resting places at the information boards or at the shelter with benches and tables encourage you to relax. A flat surface with a clear space for turning a 1500 mm diameter trolley is needed to create both a resting area and protection against rain. At the table it is good to remember to provide space for parking a trolley or pram, see Fig. 4 and 5.

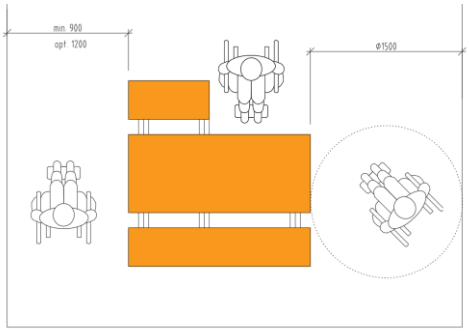

Fig. 4 and 5: Table seating with wheelchair spaces

**Results**

In the Czech Republic there are a number of barrier-free routes and tourist destinations adapted for people with reduced mobility. Some of them are easily passable, some of them need to be accompanied. The Club of Czech Tourists (KČT, Wheelchair routes) marks hiking routes suitable for wheelchair users according to their difficulty into accessible routes - blue, partially accessible routes - red and difficult to access routes - black. Tips for barrier-free hikes can thus serve mothers with strollers or elderly fellow citizens equally well.

**Conclusion**

Particularly near towns, barrier-free trails should be designed to make the forest environment accessible to all, including visitors with disabilities who often seek short-term recreation opportunities, ideally close to home.

Planning trips can sometimes be more challenging for wheelchair users, but the Czech Republic offers many beautiful places that are already wheelchair accessible and allow for comfortable exploration of history, culture and nature. There are destinations that meet accessibility requirements while offering unique experiences in beautiful countryside. Every effort should be made to make additional tourist and natural beauty accessible to these people, including their possible and necessary accompaniment, to the greatest extent possible. It is not always possible to ensure optimal conditions in the countryside that meet even the stated standard. It is therefore advisable, when publishing the route, to use a classification according to the degree of accessibility (e.g. easily accessible - moderately accessible - difficult to access), ideally accompanied by a map and an elevation profile. Creating a nature trail accessible to all is nowadays technically challenging in most cases. When implementing new nature trails or just routes, a compromise between attractiveness and accessibility must be chosen, and the possibility of implementing detour routes must be considered in the design. Extending the network of trails for people with reduced mobility and creating decent and pleasant conditions for visiting even natural trails is a beneficial vision for the future that also deserves exemplary implementation.

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**Souhrn**

Zejména v blízkosti měst je třeba navrhovat bezbariérové stezky zpřístupňující lesní prostředí všem, i návštěvníkům s tělesným postižením, kteří často hledají možnosti krátkodobé rekreace, ideálně v

blízkosti svého domova. Jsou destinace, které splňují požadavky na přístupnost a zároveň nabízí jedinečné zážitky v krásné přírodě. Měla by být maximální snaha o zpřístupnění dalších turistických a přírodních krás těmto osobám, včetně jejich případného a nezbytného doprovodu v co nejširším možném měřítku. V přírodě nelze vždy zajistit optimální podmínky vyhovující i normě ČSN 73 4001 Přístupnost a bezbariérové užívání. Je proto vhodné při zveřejnění trasy použít klasifikaci podle stupně přístupnosti (např. lehce přístupná – středně přístupná – obtížně přístupná), ideálně doplněná mapkou a výškovým profilem. Vytvoření přírodní naučné stezky přístupné všem je v dnešní době ve většině případů technicky náročné. Při realizaci nových naučných stezek nebo jen tras je třeba zvolit kompromis mezi atraktivností a bezbariérovostí, při návrzích musíme uvažovat i s možností realizace objízdných tras.

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