

# Berlin - Design for all

Public Outdoor Space

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The Berlin cityscape is becoming increasingly colourful. As in many other German and European cities, the population of Berlin is becoming more diverse, with a growing proportion of older adults. The city of Berlin seeks to prepare itself for this prospect and to present itself as a liveable, welcoming German capital. Public outdoor space, and its accessibility to all of its residents as well as its visitors, will play pivotal role in the success of this goal.

With the publication of the manual, *Berlin-Design for all: Accessible Public Buildings*, the Berlin Senate Department for Urban Development issued a planning tool for public buildings that addresses many questions of barrier-free access at an early phase of the planning process. The manual makes an important contribution to the prevention of planning errors, so that new buildings can be designed to be accessible and usable for all.

How do our public squares and parks, our paths along the river, or even our playgrounds and cemeteries actually measure up? Can they be used independently and appropriately by people with different resources and competencies? Unfortunately, there is much that remains to be done in this respect. This is not least due to inadequate or non-existent guidelines at the federal and European levels. This manual, therefore, is designed to help reduce these deficits and create a truly barrier-free city landscape, one that is in full compliance with the concept of inclusiveness set forth by the UN Convention on the Rights of Persons with Disabilities, which entered into force in 2009. The planning principles for public outdoor environments outlined in this manual, *Berlin-Design for all: Public Outdoor Space*, are informed by this perspective.

The activities that the city of Berlin has undertaken to date in this area have already attracted European-wide attention, and we look forward to maintaining this pioneering role in the future. In addition to organising projects such as the exhibition *Close Your Eyes and See* at EXPO 2010 in Shanghai, and spearheading the European working group 'Barrier-Free City for All', we in Berlin are committed to constructing outdoor public spaces that reflect our philosophy that all members of society should be able to participate fully in social life.

For this reason, the present manual has been given the title, *Berlin-Design for all: Public Outdoor Space*.

With these companion publications, for accessible public buildings and for public outdoor space, Berlin has prepared the basic framework for a building culture that integrates issues of social sustainability, diversity and aesthetics, one oriented towards future demographic and lifestyle developments. We believe that a simple, intuitive approach to urban design can counteract the overwhelming experience of the fast-paced urban environment and our increasingly technological world.

This manual is also intended to provide consistent and clear guidelines for the way that building contracts are awarded and on the different phases of the planning process to foster focused and creative implementation.

Hella Dunger Löper  
Secretary for Building and Housing

## SECTION III – Public Outdoor Space

### 1. Outdoor space for all

Building without barriers is an extremely complex challenge for any city. Nearly all aspects of urban design are affected to a greater or lesser degree. Not just streets and pavements, public and residential buildings with their surrounding properties, but the entire public sphere in the outdoors and its tremendously diverse functional areas need to welcome all people without restriction.

Berlin has a clear set of guidelines for buildings and structural works. The 2006 Building Regulations for Berlin (BauOBl), and Article 51 in particular, is at the core of its regulatory framework. The Berlin Road Act regulates all issues concerning traffic areas, and in the context of public outdoor space the Implementing Regulation on Article 7 on Pedestrian and Bicycle Paths is of particular relevance. Public outdoor space, however, is not for the most part subject to these regulations.

The requirements established by the German Institute for Standardization (*Deutsches Institut für Normung*) in 1998, DIN 18024 Part 1 – *Streets, squares, paths, public transport, recreation areas and playgrounds* no longer fully correspond to the current social policy objectives and requirements. A near-term reformulation of this standard is not currently planned.

The Berlin Senate Department for Urban Development has developed the manual *Berlin-Design for all: Accessible Public Buildings* in order to disseminate information on the principles of barrier-free construction and provide a standardised planning tool for the design of public buildings in Berlin for all actors participating in the planning process. The present manual *Berlin-Design for all: Public Outdoor Space* is intended to fill another gap, with the goal of creating a diversified but clear design across the spectrum of public spaces, one that will benefit all users.

**This manual is a direct continuation of the manual *Berlin-Design for all: Accessible Public Buildings*, such that in some places reference is made to, or specific information is cited from Sections I and II of that foregoing manual.**

Pursuant to the current standards set forth by the UN Convention on the Rights of Persons with Disabilities (Section III, 2.1.), which was ratified by Germany on 1 January 2009, public outdoor space shall be designed in compliance

with the Design for all concept (Section III, 2.1.). The obligations in the UN Convention on the Rights of Persons with Disabilities focus on deficits, existing barriers, or the lack of facilities within the built environment, rather than on the different capabilities of users.

The goal and the subject of this manual is to call attention to ways that the usability of public outdoor space can be expanded, and to ensure that these spaces are accessible to all groups of users. Special solutions for particular groups should be avoided. Guidelines, of course, are only meaningful as a basic framework. The examples and information contained herein are to be understood as suggestions, and should draw attention to recurring issues, such as:

- How space can be adapted to accommodate human physiognomy/ergonomics, regardless of permanent or temporary disability
- How to acknowledge and affirm human diversity (men, women, children, young people, older people, tourists)
- Understanding and accommodating the influence of different cultural backgrounds
- Confronting the ethical questions that arise in the design of public outdoor space

Many ideas for the design of barrier-free environments have already been implemented in Berlin. New parks, for example, offer a variety of opportunities for recreation and relaxation and encourage intergenerational communication. These are places where people come together – whether they arrive by skateboard, bicycle, wheelchair, pram, or with walking aids. But conflicts may arise. Furthermore, where the principles of barrier-free construction have been neglected during the planning process, some groups may be completely excluded from using these spaces.

The primary objective of this manual is, therefore, to integrate the requirements of barrier-free access into the design concept from the outset. Retrospective adjustments often stand out awkwardly; they often interfere with the overall concept and usually entail additional costs.

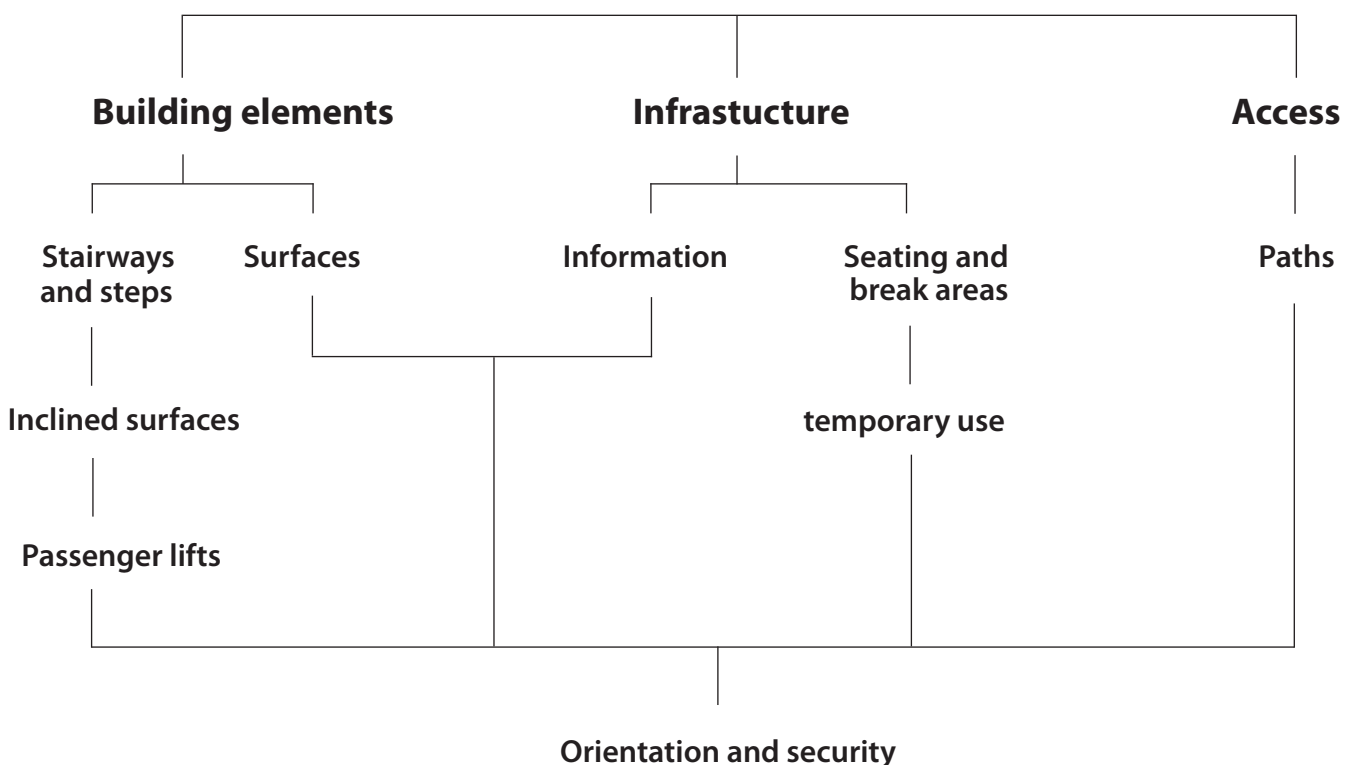
The complex and sustainable approach of barrier-free planning challenges planners to work to achieve innovative and

creative results. To design every urban space in accordance with its unique characteristics must become a goal and underlying principle for all new and revised designs, which must include a barrier-free orientation and/or the Design for all approach as a central quality criterion.

The illustrations, pictures and sketches displayed in this manual are not intended as specific guidelines. They are meant to offer some basic orientation and inspiration for the planning process.

The schematic diagram below illustrates the content structure of the manual:

## Public outdoor space

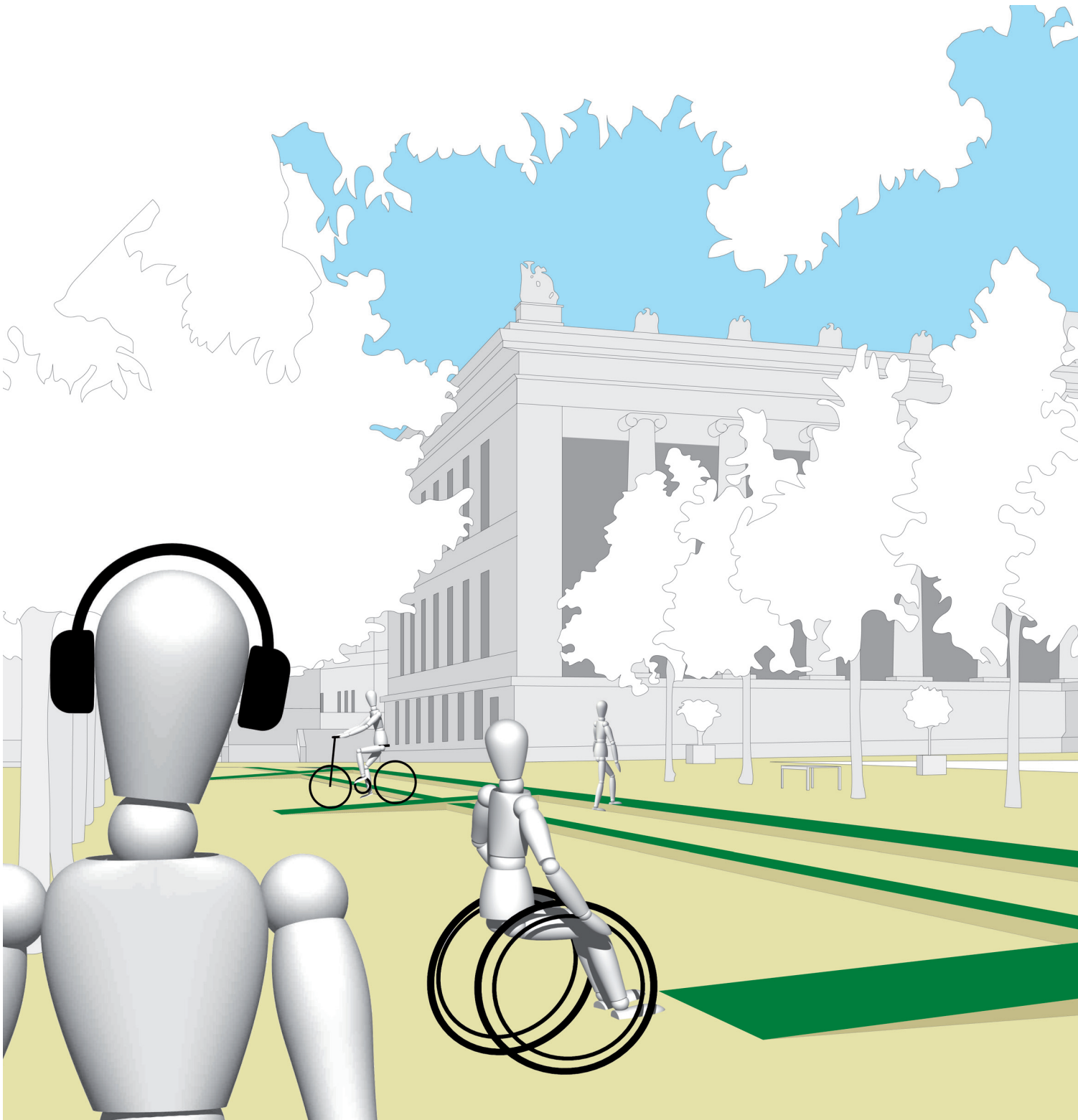


### 2. Legal framework

#### 2.1 Social policy framework

In Article 3 para. 3 of the **Basic Law for the Federal Republic of Germany**, 'No person shall be disfavoured on account of his or her disability', it is clearly stated that 'regulations that discriminate and alienate, as well as discriminatory conditions in the everyday lives of people with disabilities are not acceptable to

society as a whole'. This constitutional law not only has a declaratory nature but also represents an obligation for legislators, the government administrators, and the judiciary. In compliance with the ban on discrimination, Berlin passed the **State Equal Rights Act (LGBG)**. Federal legislation later followed suit with the **Equal Treatment for People with Disabilities Act (BGG)**.





The goal of the LGBG is the creation of equal living conditions for all people, whether they have a disability or not. In this context, the introduction of the extraordinary right of action under the Administrative Court's code of procedure provided in the LGBG (Article 15) is of particular importance. Non-profit associations with legal status that are represented on the state advisory board for persons with disabilities are

given the chance to enforce barrier-free access by means of appeal and legal remedy/redress.

The BGG, which entered into force on 1 May 2002, gave concrete, nationwide expression to the paradigm shift in disability policy and defined the concept of barrier-free access for the first time. 'Facilitating self-determination instead of providing aid' has become the new guiding principle.



Spacious combination of flat ramps and stairs Illustration based on: Lustgarten

### 2.1.1 UN Convention on the Rights of Persons with Disabilities (CRPD)

The UN Convention is based on the Universal Declaration of Human Rights and core UN human rights treaties. The Convention defines and specifies universal human rights from the perspective of persons with disabilities and in the context of their particular circumstances. The UN Convention thus represents an important step towards strengthening the rights of people with disabilities worldwide. It recognises disability as part of the diversity of human life, and in so doing overcomes the out-dated principle of providing aid, which is still prevalent in many countries (see 'Disability Report' 2009, Federal Ministry of Labour and Social Affairs).

#### Obligations of the States Parties

States Parties undertake to:

- Adopt all appropriate legislative, administrative and other measures for the implementation of the rights recognised in the present convention
- Take all appropriate measures, including legislation, to modify or abolish existing laws, regulations, customs and practices that constitute discrimination against persons with disabilities
- **Article 9:** Create measures to promote the accessibility and functionality needed for an independent life and full participation in all spheres of life in the physical environment, including:
  - transportation;
  - information and communications;
  - Accessible public institutions and services, as well as;
  - buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;
  - and to formulate minimum standards and guidelines for such accessibilityThis does not have to result in additional costs. Here, the principle of susta-

'We want a Design for all, public outdoor space for every citizen – we have to solve the squaring of the circle, that is, find the lowest common denominator that will enable every individual citizen to experience and enjoy public outdoor space, even though it is a fine art indeed to please everyone – which basically nobody can.'

Hannelore Bauersfeld, member of the working group  
'Barrier-free Construction and Transportation'

inability can prove effective. We need intelligent planning from the beginning.

### 2.1.2 National Action Plan

The aim of continuing efforts in this direction is described with the terms 'universal design' or 'design for all'. The federal government's National Action Plan for the Implementation of the UN Convention on the Rights of Persons with Disabilities defines the concept 'Design for all' as follows:

**'Design for all is a term that refers to the planning and design of products and environments (e.g., objects, buildings, public pathways, streets and squares, public green spaces and technical installations) that allows all people to use these products and environments as far as possible without individual adjustments or special assistance.'**

(From 'Toward an Inclusive Society: The Federal Government's National Action Plan for the Implementation of the UN Convention on the Rights of Persons with Disabilities', Federal Ministry of Labour and Social Affairs, August 2011)

With the National Action Plan, the federal government of Germany developed the means to systematically advance the implementation of the UN Convention over the next ten years. The National Action Plan points the way toward a society in which all people actively participate, whether they have a disability or not. As such, it relates to all aspects of life and all parts of society.

### 2.1.3 Design for all

Facts:

- 10% of the population depend unconditionally on barrier-free access
- 40% of the population need barrier-free access as an essential support
- 100% of the population appreciate the greater comfort of barrier-free access

In all phases of the planning process, the Design for all approach requires the participation of the people who will be using the spaces in the future — the people who will fill them with life. Design for all therefore represents an important step toward a sustainable future that will improve the quality of life and enable user-friendly and cost-efficient design. The Design for all approach therefore has a key role to play in space-

related research and planning practice. Future design characteristics will be oriented towards the requirements of barrier-free construction and will integrate additional factors. These are:

- Adaptation to human scale and proportions
- Respect for human diversity (e.g., gender diversity)
- Respect for the needs of the target group (e.g., older people, people with disabilities)
- A global perspective (e.g., international visitors, people with migration background).

## 2.2 Specific legal codes and frameworks

Of the few legal codes that specifically enforce barrier-free design in outdoor space, the following regulations should be mentioned.

### DIN 18024 Part 1

DIN 18024 Part 1 contains important details about the requirements for Berlin's public outdoor space. A compilation of DIN standards and guidelines that apply to public outdoor space can be found in the Appendix.

### Circular SenStadt VI A No. 03/2011

(Section II, 3.2)

In addition to standard building codes, public building projects in Berlin are subject to the quality standards outlined in this manual. **The standards in this handbook are legally binding for Berlin state building projects**, as defined in Circular SenStadt VI A No. 03/2011 – General Directive, Barrier-Free Construction, Public Outdoor Space. The use of the guidelines outlined in these manuals is strongly encouraged for the planning and construction of all other publicly accessible public buildings in **private ownership** in view of current social policy goals (State Equal Rights Act Section III, 2.1)

### Berlin Road Act (BerlStrG)

The design of streets and street furniture is subject to the Berlin Road Act and its supplementary regulations, the most important of which is the Implementation Regulation on Article 7 of the Berlin Road Act on Pedestrian and Bicycle Paths, which was introduced in March 2008 (AV Geh- und Radwege). The design of Berlin's pavements, with their typical upper and lower strips demarcating a central walkway, generally creates

good visual and tactile features for the blind and visually impaired. Since 1999, Berlin's streets have been equipped at intersections with clear visual contrasts and tactile ground indicators, as well as dropped kerbs. This, in combination with traffic light systems equipped with additional acoustic and tactile features has made street crossings safer for visually impaired or blind users as well. Elements of public street furniture and equipment such as commercial stands or displays, traffic signs, bicycle racks, waste bins, telephone boxes and similar elements must be placed so as to prevent disorientation and resulting accidents involving visually impaired users. Street equipment of this sort should only be placed in areas outside the central walkway. To make such elements detectable for blind and visually impaired persons using white canes, these elements must reach to the ground or be appropriately marked. Where potential impediments such as bollards, for example, are unavoidable, they should only be placed directly within the upper and lower pavement strips and indicated with a high-contrast design. The pavements also provide a space for non-public elements, such as freestanding seats, shop displays and awnings.

### Berlin Water Act (BWG)

The Berlin Water Act regulates, among other things, the protection, management and use of water resources. As a result of modifications to the BWG, amended on 17 June 2005, the approval of outdoor constructions in and adjacent to surface waters may, according to Article 62 para. 5, sentence 1, be subject to certain conditions that take into account the needs of persons with disabilities. The question of whether or not to impose such requirements, however, is at the discretion of the water authority, and thus does not represent a binding obligation. It is, therefore, all the more incumbent upon planners to ensure barrier-free designs in urban space, independent of discretionary arrangements and as a matter of general interest.

'It is a myth that we are all equal, even if it is rooted in the Basic Law – although even there it is with the qualification "before the law" ... and isn't that a good thing?'

Hannelore Bauersfeld, member of the working group 'Barrier-free Construction and Transportation'

### Excerpt from BWG:

Fifth Part, Section. 1, Outdoor Constructions in and Adjacent to Surface Waters

#### Article 62 Approval

Para. 5: The approval (of the water authority) may be subject to the fulfilment of certain conditions, or may be issued temporarily where it is considered necessary for the public good, **to meet the needs of persons with disabilities** (in force since 22 July 2006) or to fulfil the requirements of public law where anything to the contrary is foreseen.

Outdoor constructions in and adjacent to surface waters include, for example, moorings and jetties for commercial and passenger shipping, river cruise terminals, piers for docking pleasure craft (sport or recreational boating), shoreline stabilization and bridges.

There are no legal requirements for the design of shoreline stabilizations. Each planning process is different, and its design depends on the conditions and requirements of use (e.g., safety). The only general **technical specification** for the engineering and planning of waterfront structures is the Recommendations of the Committee for Waterfront Structures, Harbours and Waterways EAU 2004.

### 3. Structural elements

Despite the fact that the structural elements found in public outdoor spaces, such as surfaces, stairways, ramps, and lifts are the same as those found in public buildings, different parameters apply to the design of outdoor components. The following standards and regulations need to be considered:

- DIN 18024 Part 1
- DIN 32975
- Selected standards and regulations on building materials (see Table 1)
- Implementing Regulation on Pedestrian and Bicycle Paths

**The Implementing Regulation on Pedestrian and Bicycle Paths (Part B - Road engineering I) restricts the regulations of the DIN EN standards pertaining to construction products used in the manufacture of paved surfaces, slab surfaces and enclosures, and stipulates additional regulations. These restrictions apply to construction works in the public streets.**

The most important requirement for all structural elements is having a high-contrast and self-explanatory design, which means a functional and creative design that reflects the Design for all concept.

#### 3.1 Surface design

A safe walking area free from obstacles should be provided and should be easily recognised and followed by all users.

##### Requirements

- Level, non-skid surfaces
- Small joint spacing
- Tight, even joints, especially for joints  $\geq 8$  mm
- Paving stones with a small chamfer or unchamfered
- Tactile and colour contrasts
- Functional drains

**Large surface areas require considerably higher contrast values. It is important to consider that external factors such as sun and shade, rain, snow and ice may have a dramatic impact on the quality and properties of the surface. For example, contrasts may appear reversed when the surface is wet from rain!**

(Section III, 4.1.1.)

The contrast values of the materials must be adapted to local conditions (DIN 32975, minimum contrast value = 0.4 for orientation and guidance systems, such as floor indicators or markings).

Table 1 provides a comparative rating of selected surface materials, showing various features with their relevance for barrier-free access.

Table 1: Surfaces rated according to barrier-free criteria

Type of surface	Physical/Design features	Quality features	Notes	barrier-free	
				yes	no
<b>Concrete pavers</b>	<ul style="list-style-type: none"> <li>Pursuant to 'Implementing Regulation on Pedestrian and Bicycle Paths'</li> <li>Unchamfered or low-chamfered stones</li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible</li> <li>Non-skid surface<sup>1</sup></li> <li>Durable; weatherproof</li> </ul>	<ul style="list-style-type: none"> <li>Unchamfered or small-chamfered stones preferred<sup>2</sup></li> </ul>		
Interlocking concrete pavers	<ul style="list-style-type: none"> <li>Interlocking pattern</li> </ul>	<ul style="list-style-type: none"> <li>Broad range of shapes, colours and sizes</li> </ul>		x	
Porous paving stones	<ul style="list-style-type: none"> <li>Air and water permeable</li> </ul>			x	
Concrete slabs		<ul style="list-style-type: none"> <li>Broad range of shapes, colours and sizes</li> </ul>	<ul style="list-style-type: none"> <li>Few joints</li> </ul>	x	
Grass pavers	<ul style="list-style-type: none"> <li>Individual openings</li> </ul>	<ul style="list-style-type: none"> <li>High rolling resistance</li> <li>Not wheelchair accessible</li> </ul>	<ul style="list-style-type: none"> <li>Not for use in pathway areas</li> </ul>		x
<b>Paving brick</b>	<ul style="list-style-type: none"> <li>Pursuant to 'Implementing Regulation on Pedestrian and Bicycle Paths'</li> <li>Sharp or chamfered edges</li> <li>Categorised according to abrasion, skid resistance and strength</li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible</li> <li>Non-skid</li> <li>Durable; weatherproof</li> <li>Broad range of shapes, colours and sizes</li> </ul>		x	
<b>Natural stone<sup>3</sup></b>	<ul style="list-style-type: none"> <li>Pursuant to 'Implementing Regulation on Pedestrian and Bicycle Paths'</li> <li>Split</li> <li>Sawn surface</li> <li>Narrow joints</li> </ul>	<ul style="list-style-type: none"> <li>Non-skid</li> <li>Broad range of colours depending on natural stone resources</li> </ul>			
Mosaic block paving	<ul style="list-style-type: none"> <li>Size 50 x 50 mm</li> <li>Mostly granite or limestone</li> <li>Customised patterns</li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible</li> </ul>		x	
Small paving stones <sup>4</sup>	<ul style="list-style-type: none"> <li>Size 90x90 mm</li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible</li> </ul>	<ul style="list-style-type: none"> <li>Added reinforcement, structuring</li> </ul>	x	
Large paving stones	<ul style="list-style-type: none"> <li>Size 160x160 mm (up to 220x160 mm) or 120x120 mm (up to 180x130 mm)</li> <li>Sawn surfaces recommended</li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible</li> </ul>		x	
Platten		<ul style="list-style-type: none"> <li>Good wheelchair access</li> </ul>	<ul style="list-style-type: none"> <li>Few joints</li> </ul>	x	
Cobblestone <sup>5</sup> (chiefly historical)	<ul style="list-style-type: none"> <li>Undressed (round, asymmetric, uneven surface)</li> </ul>	<ul style="list-style-type: none"> <li>High rolling resistance</li> <li>not wheelchair accessible</li> </ul>	<ul style="list-style-type: none"> <li>Not for use in pathway areas</li> </ul>		x

## Public Outdoor Space

				barrier-free	
Type of surface	Physical/Design features	Quality features	Notes	yes	no
<b>Water-bound surfaces</b>	<ul style="list-style-type: none"> <li>Pursuant to 'Implementing Regulation on Pedestrian and Bicycle Paths' - Part B II (8)</li> </ul>				
Aggregate (fine)	<ul style="list-style-type: none"> <li>Longitudinal slope <math>\leq 6\%</math> to prevent erosion through surface runoff <sup>6</sup></li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible reduced under wet conditions</li> <li>Good traction</li> <li>Broad range of colours</li> </ul>	<ul style="list-style-type: none"> <li>Not to be directly combined with tactile routing elements on the ground or steps <sup>7</sup></li> </ul>	x	
Sand, gravel, crushed rock	<ul style="list-style-type: none"> <li>Loose fill material</li> </ul>	<ul style="list-style-type: none"> <li>High rolling resistance</li> <li>not wheelchair accessible</li> </ul>	<ul style="list-style-type: none"> <li>Not for use in pathway or common/gathering areas</li> </ul>		x
<b>Bark mulch</b>	<ul style="list-style-type: none"> <li>Hard-surfaced</li> </ul>	<ul style="list-style-type: none"> <li>High rolling resistance</li> <li>not wheelchair accessible</li> </ul>			x
<b>Open surfaces</b>	<ul style="list-style-type: none"> <li>Permeable to water and air</li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible</li> <li>Non-skid</li> <li>Durable; weatherproof</li> </ul>	<ul style="list-style-type: none"> <li>Cross slope may be reduced to 1%</li> </ul>		
Porous asphalt	<ul style="list-style-type: none"> <li>TL Asphalt-StB 07, ZTV Asphalt-StB 07</li> </ul>	<ul style="list-style-type: none"> <li>Broad range of textures and colours</li> </ul>		x	
Binding agent: fine aggregate/composite	<ul style="list-style-type: none"> <li>Epoxy resin binder</li> </ul>	<ul style="list-style-type: none"> <li>broad range of colours</li> </ul>		x	
<b>Closed surfaces</b>	<ul style="list-style-type: none"> <li>Waterproof</li> </ul>	<ul style="list-style-type: none"> <li>Wheelchair accessible</li> </ul>	<ul style="list-style-type: none"> <li>Cross slope <math>\geq 1\%</math> to max. 2.5%</li> </ul>		
Guss asphalt <sup>8</sup>	<ul style="list-style-type: none"> <li>TL Asphalt-StB 07, ZTV Asphalt-StB 07</li> </ul>	<ul style="list-style-type: none"> <li>Good traction</li> <li>Broad range of textures and colours</li> </ul>		x	
Rolled asphalt	<ul style="list-style-type: none"> <li>Stone mastic asphalt or asphalt concrete</li> </ul>			x	
Concrete surfaces <sup>9</sup>	<ul style="list-style-type: none"> <li>TL Beton-StB 07, ZTV Beton-StB 07</li> </ul>	<ul style="list-style-type: none"> <li>Rigid, high-strength surface</li> <li>Structure varies with treatment</li> <li>Limited range of colours</li> </ul>		x	
<b>Synthetic surfaces</b>	<ul style="list-style-type: none"> <li>Permeable to water</li> <li>Waterproof - if so, a steeper slope is required (max. 2.5%)</li> </ul>	<ul style="list-style-type: none"> <li>broad range of colours</li> </ul>			
Solid surface		<ul style="list-style-type: none"> <li>Wheelchair accessible</li> </ul>		x	
Elastic surface		<ul style="list-style-type: none"> <li>Wheelchair accessible</li> </ul>		x	
Area elastic surface		<ul style="list-style-type: none"> <li>High rolling resistance</li> <li>Not wheelchair accessible</li> </ul>			x

Type of surface	Physical/Design features	Quality features	Notes	barrier-free	
				yes	no
Lawn	<ul style="list-style-type: none"> <li>· Level</li> </ul>	<ul style="list-style-type: none"> <li>· High rolling resistance</li> </ul>	<ul style="list-style-type: none"> <li>· Areas where driving is minimal</li> </ul>		x
Timber	<ul style="list-style-type: none"> <li>· Few joints</li> <li>· Grooved structure</li> <li>· With downhill gradient</li> </ul>	<ul style="list-style-type: none"> <li>· Wheelchair accessible</li> <li>· Good traction</li> <li>· Slip hazard under wet conditions and leaf litter</li> </ul>	<ul style="list-style-type: none"> <li>· Partial-areas (only in combination with other materials or in sheltered areas)</li> </ul>	x	
Metal	<ul style="list-style-type: none"> <li>· Mesh width max. 12 x 12 mm; recommended 8mm</li> <li>· Broad orientation of gratings profiled</li> <li>· Surface should be flush with surrounding; no sharp edges</li> </ul>	<ul style="list-style-type: none"> <li>· Increased rolling resistance</li> <li>· Wheelchair accessible with small mesh width</li> <li>· Good traction</li> <li>· Slip hazard under wet conditions and leaf litter!</li> </ul>	<ul style="list-style-type: none"> <li>· Partial-areas (only in combination with other materials)</li> <li>· Larger mesh widths may create a sense of discomfort and insecurity</li> </ul>	x	

<sup>1</sup> Artificial stone with Teflon® cover offers increased skid resistance among other features.

<sup>2</sup> Deep chamfers produce wider joints and higher rolling resistance.

<sup>3</sup> Avoid fractured and bush-hammered surfaces on main routes. Stone pavers with split or sawn surfaces are preferred. Split stones are also an accepted standard. For large areas, special attention needs to be paid to the surface reflection factor. A high percentage of quartz may result in undesired glare and reduce visual contrasts.

<sup>4</sup> Small paving stone is preferable to larger-sized pavers (lower rolling resistance).

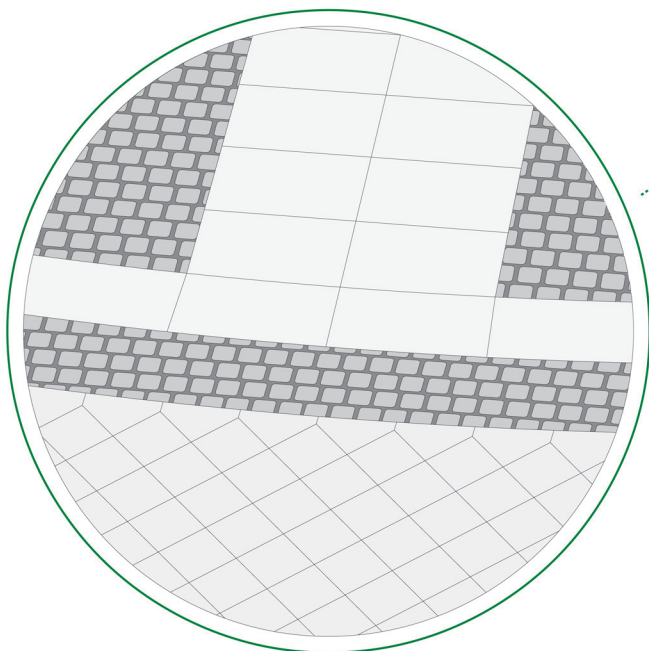
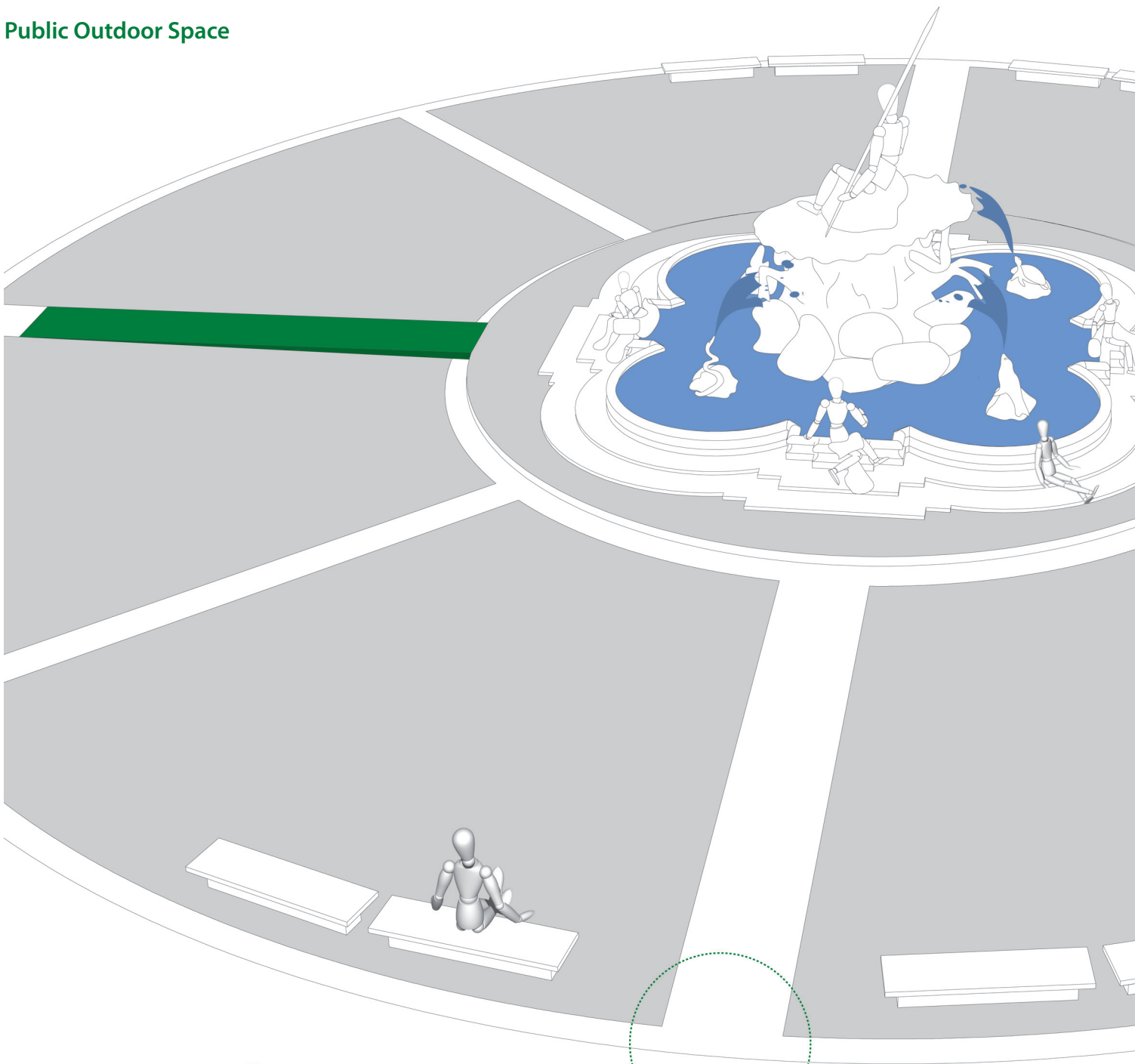
<sup>5</sup> In historically protected areas, natural stone materials must be preserved and adapted as needed to meet recommendations (e.g., sand down pedestrian areas and replace with cut stones or fill joints.)

<sup>6</sup> Regular maintenance of the surface is required. For longitudinal slopes of >6% a solid surface such as asphalt should be used. **In heavily trafficked areas** (e.g., by bicycles or maintenance vehicles), a waterround surface is **not suitable**. A solid surface offers more favourable properties for these applications.

<sup>7</sup> Gravel or aggregate may detract from the tactile properties of floor routing elements and/or aggregate deposits may obscure contrasting step edges, making them unrecognizable

<sup>8</sup> To improve traction, fine-grained aggregate may be added to the asphalt surface, resulting in a visual impression of a sand or gravel surface.

<sup>9</sup> For better traction, the surface can be structured using different methods.

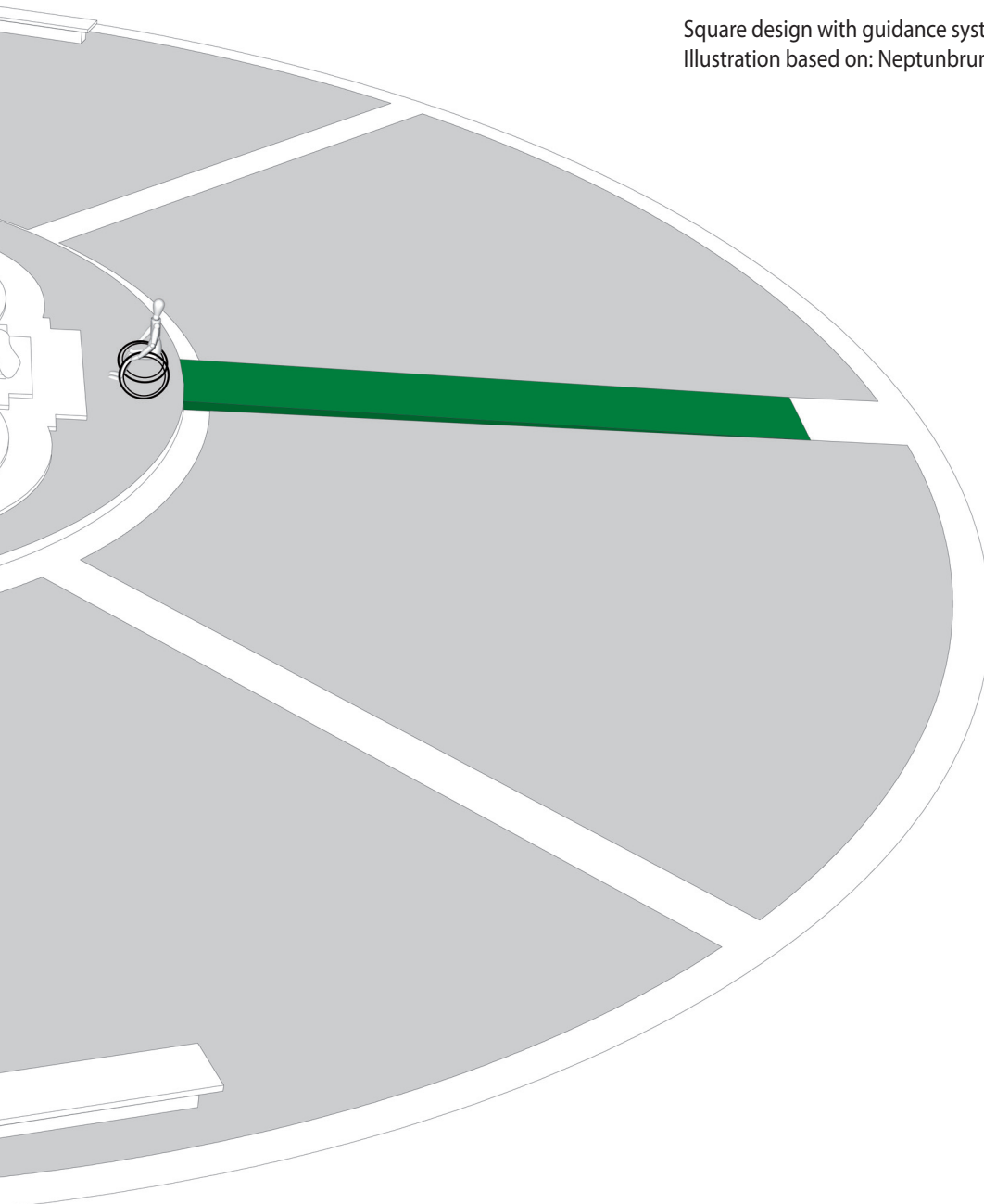


Visual and tactile square boundary

The surface design of a public square has a decisive impact on its later use. This carries a certain potential for conflict in the planning process, but also presents an opportunity to avoid future conflicts. The ground composition and structure guides users in different directions, whether they are aware of it or not. As such, one of its primary functions should be to indicate the safest routes across the square. The **mechanical properties** of the materials involved, as well as **colour, brightness and reflective qualities** of materials can all play a role to this end. Skid resistance must be ensured under all circumstances and in all weather conditions.



Square design with guidance system and barrier-free access to the fountain  
Illustration based on: Neptunbrunnen



Materials with strong visual and tactile contrasts should be chosen in the construction or renovation of public squares. The targeted use and combination of materials and paver sizes and shapes have a decisive impact on how well a square is received as part of the cityscape. They also help people get their bearings by providing a guidance system that differentiates the different areas within the square and sets the larger square off from the surrounding area.

To secure barrier-free access, at least to the key points in the square, and to ensure the unproblematic crossing of a public square, level paths marked with

visual and/or tactile indicators can be created, depending on the importance of the respective route. Whereas it may be sufficient to use visually and tactilely distinctive materials to indicate something like the route to a central fountain, stricter parameters apply to the identification of pedestrian crossings, bus stations or other potentially hazardous areas. In these areas, paths are equivalent to those regulated by the Implementing Regulation on Pedestrian and Bicycle Paths (AV Geh- und Radwege). Here, special floor indicators (Section III, 4.1.2.) or even additional acoustic signals may be required.

**Note that using too great a variety of materials and too many contrasts in a public square may cause confusion and make orientation more challenging. In this case, less may be more!**

### 3.2 Stairways and steps

To ensure unrestricted access, stairways and steps must be constructed according to a barrier-free design. General information on geometry and measurements is provided in Section II, 4.4.

#### Requirements

- Avoid extreme projecting tread nosing (depending on the slope, step overhang requires a greater tread depth)
- No open risers
- Integrate detectable warning surfaces (with strong visual and tactile contrasts) in advance of downward-leading staircases (at a distance of 0.60 to 0.90 m)
- Step edges should be marked with strong contrasts (colour, ornamentation, tactile surfaces, etc.)
- Stairways with up to 3 steps (4 risers): each step marked
- Stairways more than 3 steps (4 risers): a minimum of the first and the last step of the stairway marked
- Upstands at the sides of steps should be avoided, especially on low-rise steps (tripping hazard!)
- Side edges of stairways should be marked by visual and tactile contrasts
- Stairways with 3 and more steps (4 risers) require a handrail
- Handrails and other vertical markers

should be visible from a distance (contrasting design), especially on expansive, open squares

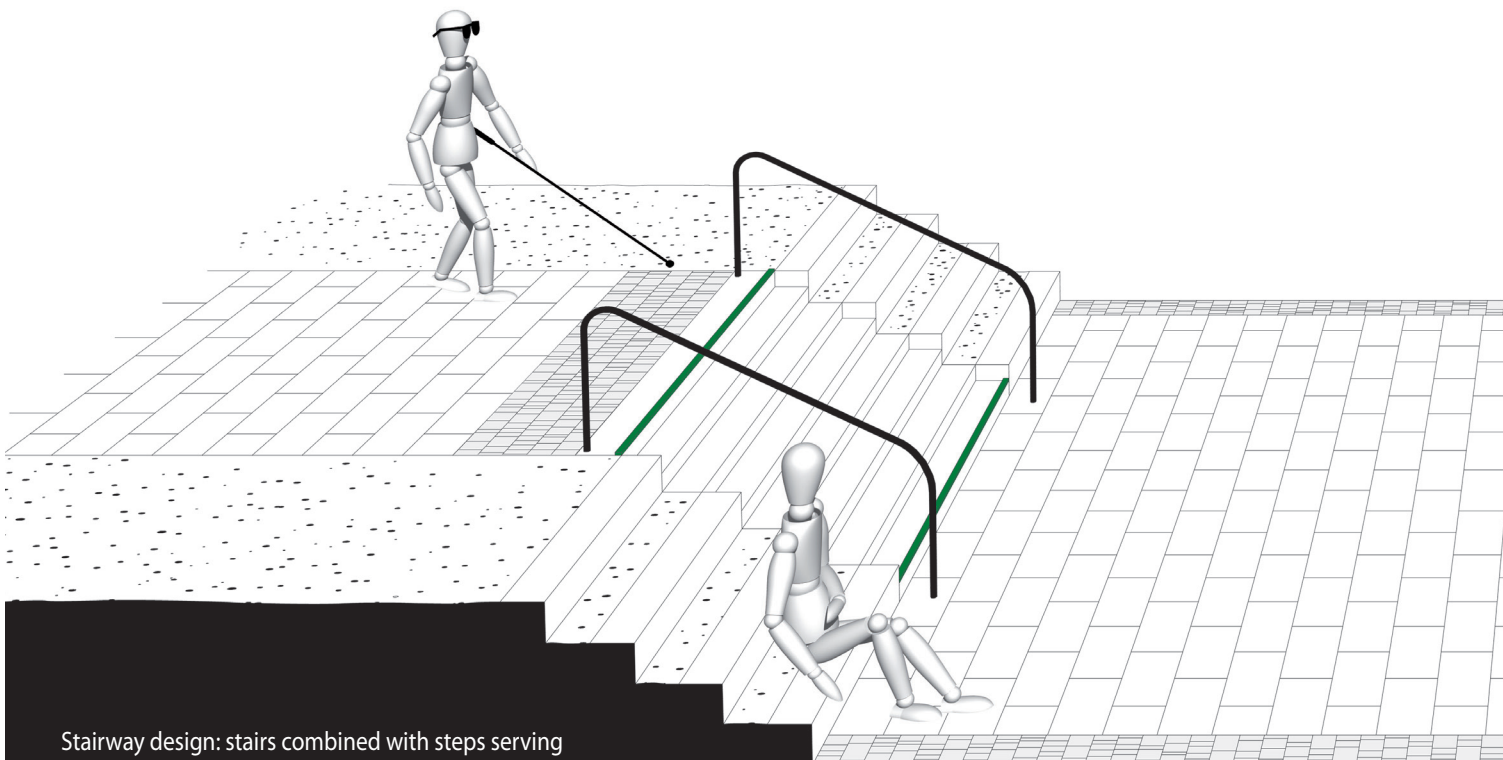
- Stairways with a passage width of greater than 5.00 m should be designed with an additional central handrail
- Design of steps should consider the lateral reach to the handrail, taking into consideration, for example, the presence of balustrades or sweeping chutes.
- Handrails should be designed ergonomically.

Minor height differences in the steps should be compensated for primarily through grading of the surface.

Note: A handrail can offer support as well as providing a routing element.

#### Low-rise steps

Low-rise steps have more rigorous design requirements. To compensate for low-rise steps or stairs that are cut into a sloped surface, pedestrian flow must be guided so as to avoid suddenly running across the inserted steps (sudden changes in slope or slant). **The leading edges of the treads must be clearly marked.** Low-rise steps require dimensions that permit a comfortable walking rhythm. In addition to a high-contrast definition of risers and treads of the steps, the leading edges of the



Stairway design: stairs combined with steps serving for a seat and stairs with long steps

treads must be clearly marked in the case of low-rise steps as well as steps that are cut into a slope. The minimum riser height for low-rise stairs is 4 cm.

### Step markings

Strong and durable solutions for new construction include:

- Colouration of concrete step edges during production
- Square-shaped cut-outs at the front edge of steps, replacement by contrasting material (inlay), for example, in the case of natural stone

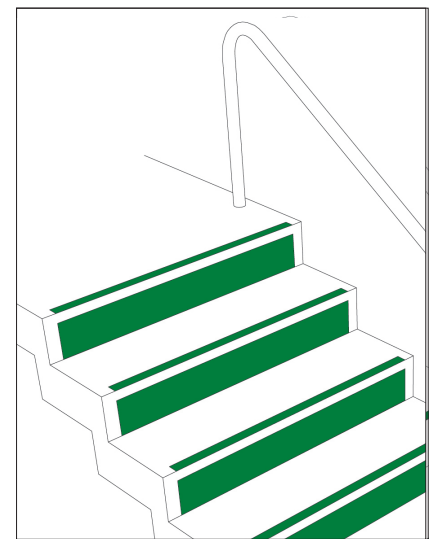
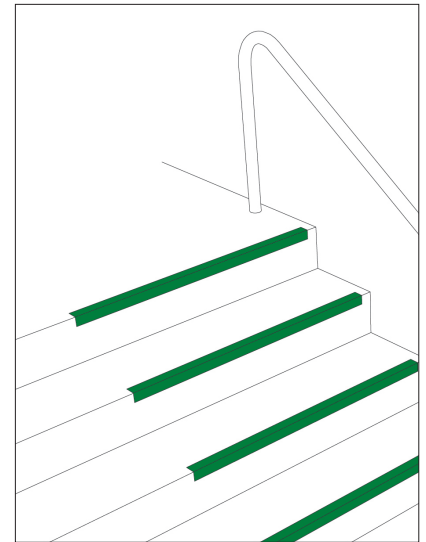
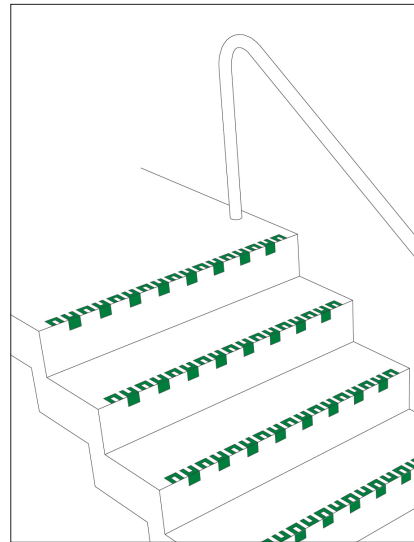
Retroactively:

- Ensure skid resistance (e.g., on metal rails)
- Mill to create shallow grooving of surfaces; use colours or synthetic inlays as appropriate

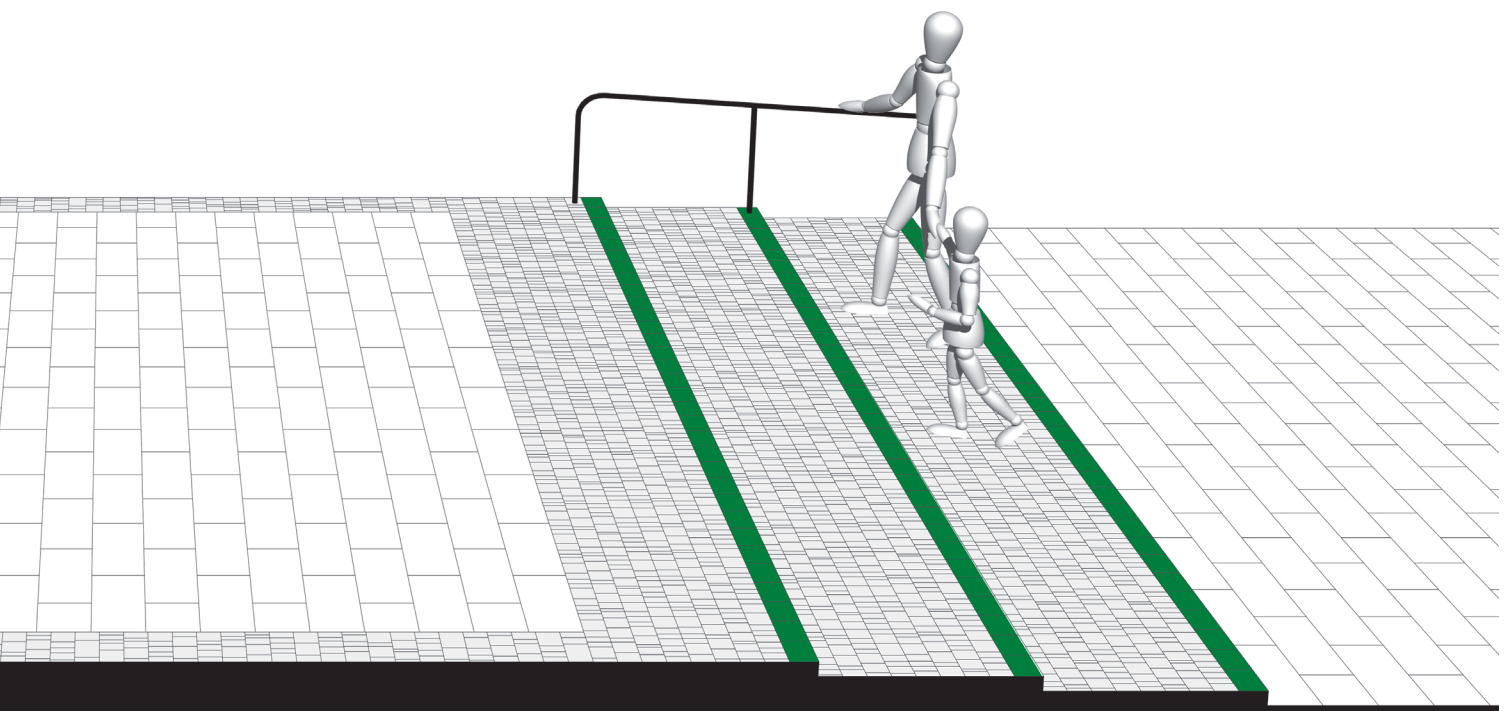
Good visual contrast can be created through the abrasion of smooth surfaces. This changes the reflective properties of the material (Section III, 4.1.1.).

Painted or adhesive markings are less desirable since they need to be replaced on a regular basis. They may, however, be a good option for temporary structures and installations.

In addition to stairways and steps, barrier-free access to spaces must be ensured using inclined access routes or ramps; lifts or lifting systems may also be considered in specific situations.



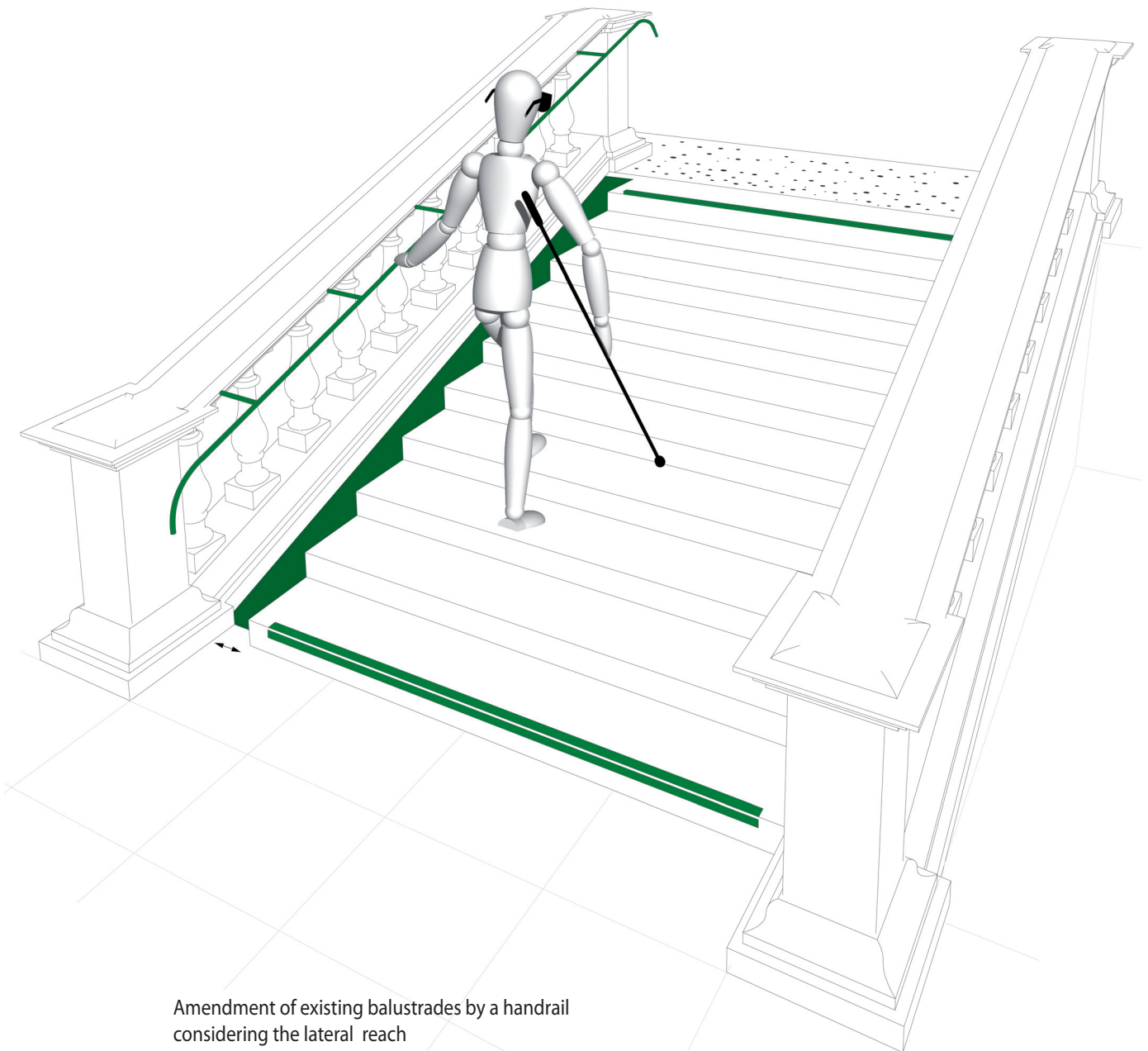
Examples of step markings



## Public Outdoor Space

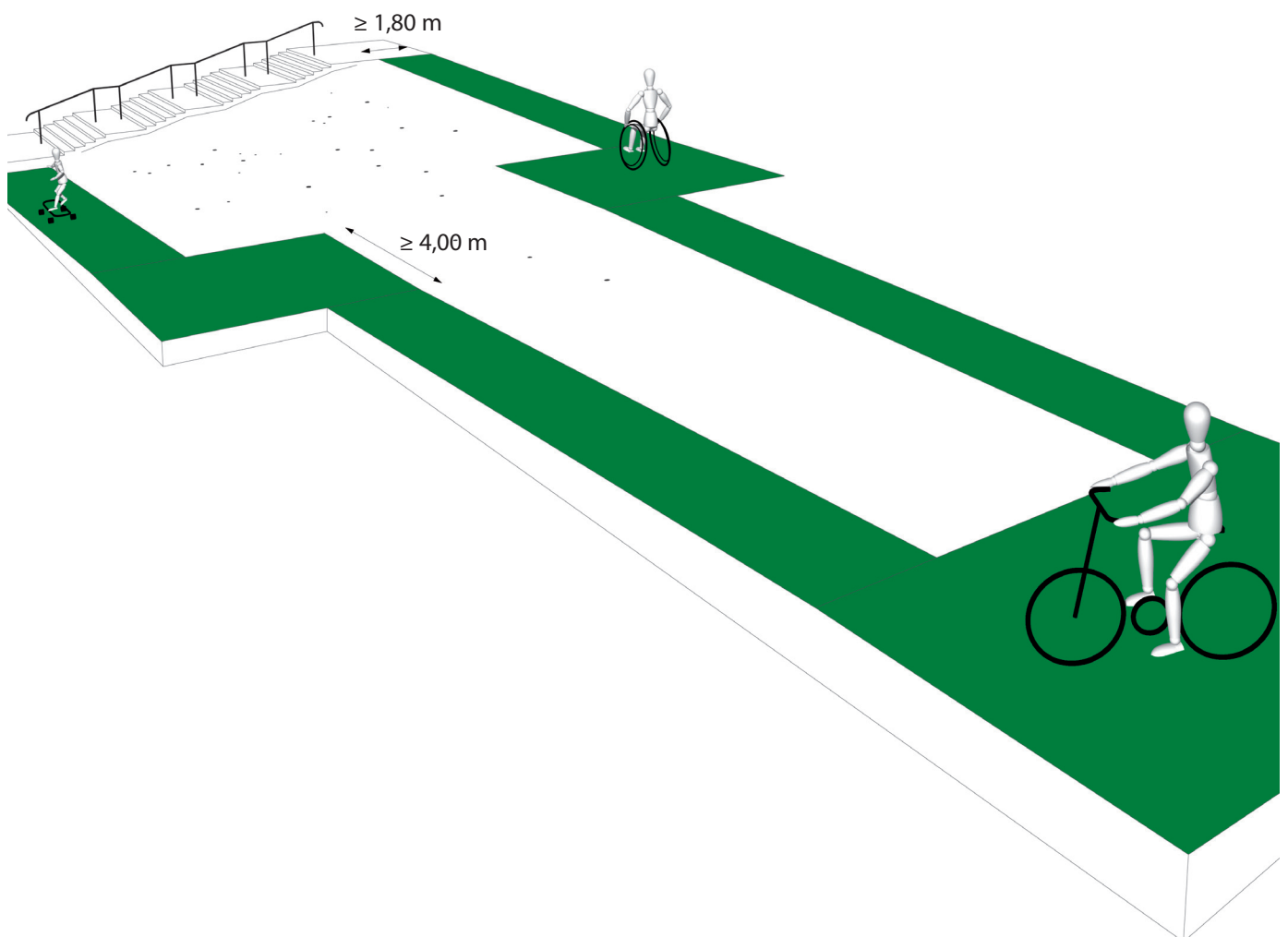
**Table 2:**  
Stairways and steps (Berlin-Design for all) compared with DIN 18024 Part 1 and DIN 18065 regulations

DIN 18024 – 1, DIN 18065	Recommendations for public outdoor space
Projecting nosing (i.e., stair tread overhang) is <b>not permitted</b> .	Slight nosing protrusions may be acceptable, accompanied by an adjustment of the riser/ tread ratio (i.e., wider treads)
Stairways should have an <b>upstand of at least 2 cm</b> on the edge of open steps.	<b>Upstands should be avoided</b> on the sides of a free-standing stairway, since they can be a tripping hazard. The lateral edges of the steps should instead be emphasised through a design with high visual and tactile contrasts.
A handrail is required for stairways with <b>3 or more</b> steps.	A handrail is required for stairways with <b>3 or more</b> steps.
	An additional handrail in the middle is required for stairways of 5 m width and greater.



**Table 3:**  
Comparison of measurements for inclined surfaces and ramps according to different criteria

Inclined areas and ramps	BauOBln/DIN 18024-1	User friendly/functional	Optimized for use (e.g., by cyclists)
Minimum width	1,20 m	1,50 m	≥ 1,80 m
Minimum movement area/Length of landing	1,50 m	2,00 - 3,00 m	≥ 4,00 m
Maximum longitudinal slope	4 - 6%	3 - 4%	3%
Maximum cross slope	2% ramps 0%	1% ramps 0%	0%



Spacious ramp system with large movement areas (bicycle use)

### 3.3 Inclined surfaces and ramps

The basic dimensions for ramps (DIN standards, BauOBIn), as functional measurements, must be strictly followed. In outdoor areas, however, these specifications should not be adopted before a thorough assessment of local conditions has been undertaken. They should be adapted to the geometrical-topographical conditions, user traffic, and other characteristics of the site. Where possible, the topographic surface should be levelled to the minimum possible incline rather than installing a concrete ramp structure. Areas with a maximum longitudinal slope of 3% provide favourable conditions for this solution, and Berlin's topographic conditions generally accommodate this. **Nevertheless, the creation of expansive inclined areas should be avoided**, since shared use of these areas can become problematic during cold weather and rain or snowfall.

#### Requirements for inclined surfaces

- Minimum width 1.20 m (if used by bicycles, 1.80 m is preferable)
- Maximum slope 4% (easy and safe handling for pedestrians and wheelchair users)
- Avoid cross slopes (Section II, 4.3.; minimum 1% up to maximum 2.5% depending on material and design)
- To compensate for a slight cross slope: open surface (Table 1), cross drain (Section II, 4.1. Gutters)
- The beginning, end and change of gradient should be indicated with a change of material, texture or colour of the ground surface
- Movement area of at least 1.50 x 1.50 m at the beginning and end of the inclined surface (high visual and tactile contrast)
- Adjust depth of the movement area if surface is **used simultaneously by cyclists (minimum 4.00 m)**
- Placement of level intermediary areas as required by site conditions
- Downward-leading stairways should not be directly aligned with an inclined surface (where this is inevitable, they must be kept to a minimum distance of 4.00 m with a clear marking of the first step) (Section III, 3.2.)
- Provision of rest areas and seating

#### Requirements for Ramps (Section II, 4.3.)

Ramps should be designed without cross slopes. Aesthetic features in ramp design can minimise psychological barriers that may arise from facing a very long or steep surface in particular, giving rise to a more

rewarding and interesting experience (e.g., mosaic patterns or a mix of materials in the surfacing, tiling pattern, colour contrasts, design of the handrail or railing).

**If, due to special circumstances, a handrail or side upstand is omitted from the design, these missing elements must always be compensated for by visual and tactile markings! In these cases, potentially dangerous zones on either side of the ramp as well as at the beginning and end of the slope need to be designed incisively and with attention to each detail. Lateral markings with high visual and tactile contrast assist in the steering and control of a wheelchair.**

#### Materials

(Section III, 3.1)

Depending on its size and social importance as well as the urban planning significance of a public square, existing differences in ground levels can largely be offset in the space of the surrounding street. More significant height differences may require the installation of lifting systems in addition to stairways. The choice between using the traffic area or installing a lifting system will strongly depend on the frequency and the significance of the square. Where ramps or inclined surfaces are available to bypass steps, they should have an intuitive design and share a common beginning and endpoint with the stairs to avoid separating people who cannot use the stairs from those who can. Heating the ground surface during colder seasons may be useful where increased traffic to and from the area may be expected, for example, connected to the access of local public transport systems.

### 3.4 Lifts

Passenger lifts in public outdoor spaces must meet the demands of a diverse user group. They are subject to the general requirements set out in Article 39 BauOBIn in conjunction with DIN 18040 Part 1. The fundamental parameters can be found in DIN EN 81-70. In addition, this standard contains comprehensive additional information for the usage by people who are blind or visually impaired (Appendix E).

Additional planning framework:

- DIN 32975

Section II, 4.7 contains more detailed information on dimensions, contrasting designs, control elements, equipment and lifting systems.

#### Requirements for free-standing lifts in public space

- Perceivable from a distance (structural appearance, pictogram)
- Step-free access and wheelchair accessible
- Transparent design (social control) following standards for glass marking (DIN 32975)
- Movement area in front of lift at least 1.50 x 1.50 m – preferably 2.00 m deep (e.g., for bicycles) and sheltered, where possible
- Movement area should not overlap with areas of high pedestrian traffic
- Tactile routing strips in the floor along the route to the call panel or column
- Call panel should be mounted on the right-hand side wherever possible (orientation)
- Call buttons must be reachable from a wheelchair (e.g., curved call panel at a height of approx. 0.80 to 0.85 m)

#### Lift cabins

- Recommended dimensions: 1.40 x 2.10 m
- Optimal: automatically closing doors on the opposite side (open in front and rear)
- Minimum door width of 0.90 m
- Minimum width of 1.10 m for lifts with only one cabin door
- Mirror or high-gloss stainless steel opposite the entrance door

**With increased user traffic, the guidelines indicated in the DIN standards (e.g., door width, cabin size, control devices) should be adapted and/or expanded accordingly.**

The design of lifts for public outdoor spaces should be incorporate security features to prevent crime, including:

- Open and transparent design
- Exposed position
- Sufficient lighting (brighter than ambient level of light)

### 3.5 Additional structural elements

#### 3.5.1 Sculptures and fountain installations

Sculptures and art objects, as well as fountains such as those located in public squares, are popular intergene-

ration meeting places and serve as important points of reference for all users of public space.

Touching water is a rich sensory experience that should be made available to everyone through the implementation of an appropriate design. **Fountains are also effective acoustic orientation aids.**

**Note: Whereas the sound of flowing or splashing water (e.g., fountains) may filter out distracting noises such as traffic and function as an orientation aid, it may also make it even more difficult for hearing-impaired people to understand. People with vision impairments may be less able to perceive surrounding sounds and thus experience a diminished sense of orientation.**

Sculptures and fountains with culture-historical and artistic importance should be explained to visitors by means of signs or panels that include tactile letters or figural representations (Section III, 4.2.). Multilingual explanations should be provided to help visitors obtain a better understanding of the location.

#### Requirements for interactive areas of public water installations:

- Non-skid surface
- Visual and tactile demarcation
- Maximum 6% slope to facilitate walking

#### 3.5.2 Elevated landscape beds

Landscape beds offer people with limited mobility the opportunity to learn about flowers and plants through their own sensory experience. If a flower bed is meant to be a sensory element, the following knee clearance should be provided for wheelchair users:

- Minimum 0.70 m height
- Minimum 0.90 m width
- Minimum 0.55 m depth

The design of raised landscape beds should create strong contrast with the environment. The integration of a tactile boundary into the surface material facilitates detection.

#### 3.5.3 Gutters

(Section II, 4.1.)

### 3.5.4 Tree pits

Tree pits are actually barriers and should be clearly distinguishable from the adjacent area through visual, tactile, and, where appropriate, acoustic contrasts.

Design examples:

- Bark mulch with flush border
- Metal grille at ground level (attractive and clean; visually, tactilely and acoustically detectable)
- Elevated borders (e.g., accommodating seating)
- Cast iron fencing for tree pits or tree guards (e.g., on monumental or historic public squares).

Tree pits located in the main walkway, however, such as those found in public squares, should be safe to walk on and accessible for wheelchairs.

### 3.5.5 Hearing systems

Hearing-impaired persons depend on special hearing systems in order to understand acoustic transmissions during outdoor events. The most important examples of these are radio transmission systems, induction loop systems and infrared transmission systems.

Unlike use in enclosed areas, when they are used outside these various transmission systems may be obstructed in outdoor areas by various physical hindrances like buildings and trees. They may be influenced by variations in sunlight and shade during the daytime. Infrared transmission systems are particularly strongly affected by variations in light and shadow.

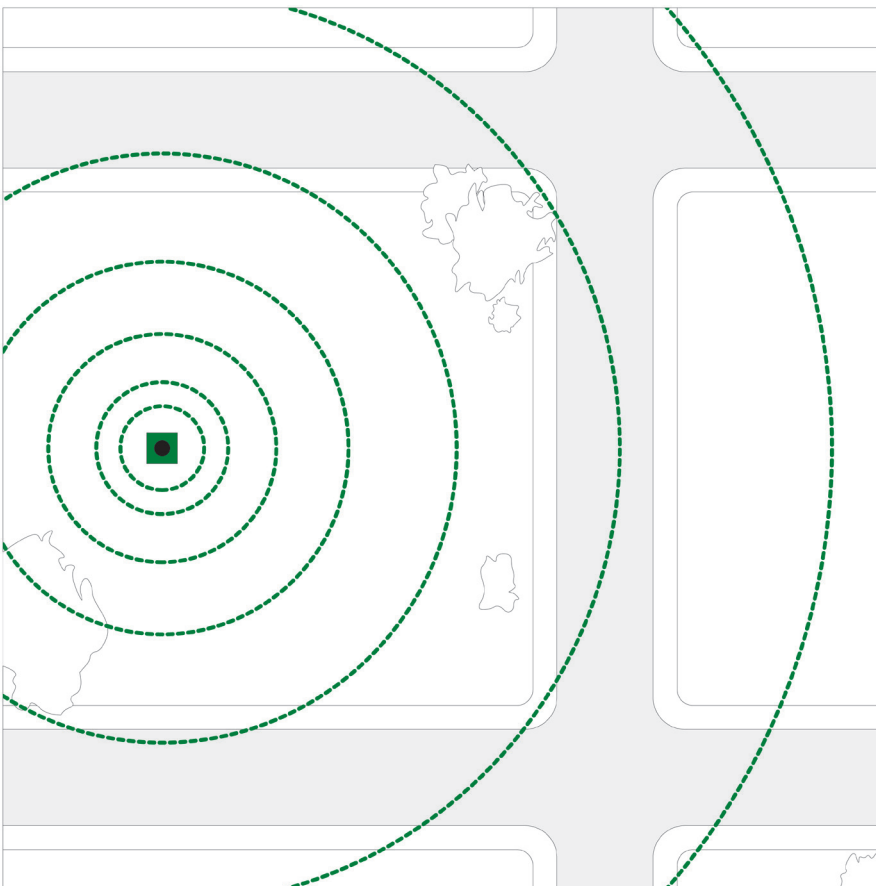
#### Radio transmission systems

are very well suited to **outdoor use**.

These systems involve:

- One transmitter unit and at least one receiver unit
- Wireless transmission of signals by the transmitter (e.g., connected to a microphone device) to the receiver (equipped with a teleloop or induction loop system for transmission to the hearing device)
- **Excellent range** (above 300 m), not sensitive to physical obstacles
- **Multichannel systems:** simultaneous supply of different information (accommodates several groups, such as simultaneous transmission in different languages or on different topics)

Functional principle of a radio transmission system





- Mobile tour guide systems that transmit information among larger or distributed groups (museums, guided tours)
- Interference with outside radio systems may occur that can affect the quality of transmission (requires tuning)

### Induction loop systems

for short-term use have a limited application in outdoor settings and should be used for specific audiences in accordance with the location and prevailing conditions.

Induction loop systems involve:

- An induction loop (insulated wire loop) and loop amplifier
- General compatibility with hearing aids (telecoil)
- Additional receivers for listeners not using hearing aids (e.g., headphone, headset)
- Induction loop transmission **without disruptive noise**
- **Users are able to move freely** within the induction loops (constant field intensity)
- Loop routing has an impact on transmission quality (i.e., the loop geometry will be determined by the existence of conductive material such as reinforced concrete, metal constructions or technical installations)
- Caution: Loose cords can pose a tripping hazard!
- For narrower ranges (e.g., around information counters or reception areas), smaller compact induction loop systems can be mounted, for example, to a counter.

### Infrared transmission systems (IR) are not suited to outdoor events

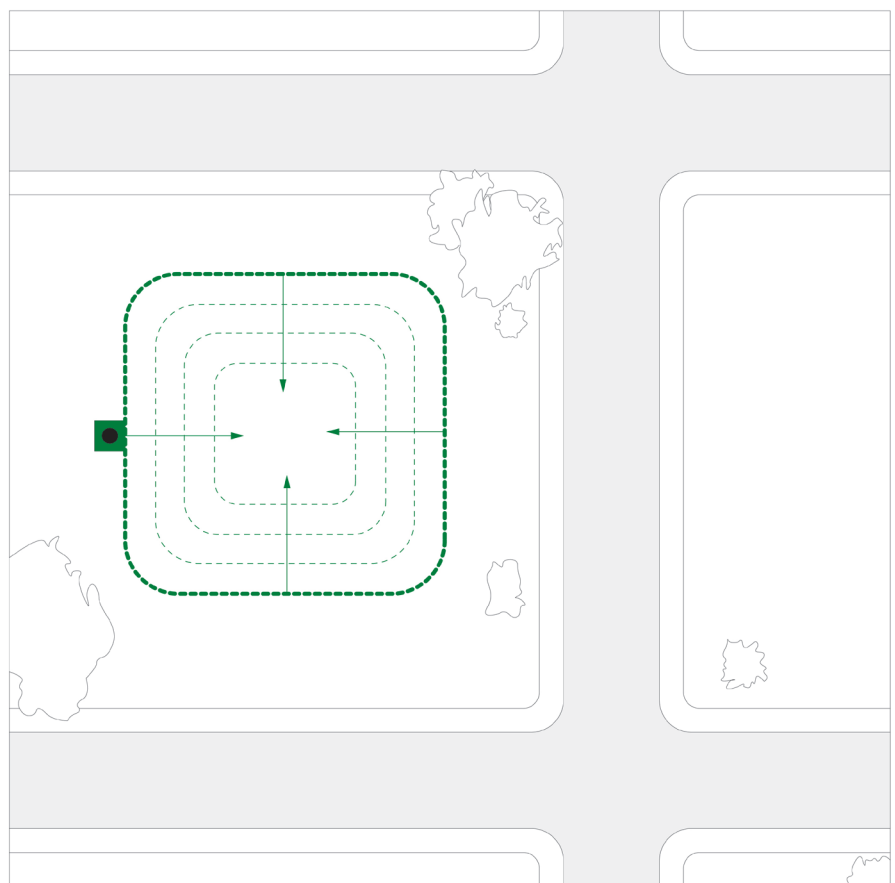
since they are sensitive to changing light conditions (sun, shade) and present problems with range.

- Potential for functional disruption through exposure to direct sunlight
- Infrared signals do not pass through walls (for example, for an event taking place within a tent, IR reception would only be ensured inside the tent)

The installation of hearing systems should be carefully planned in consultation with trained professionals to achieve optimum transmission quality (DIN EN 60118-4).

The appropriate international pictogram (DIN 66079-4) should be used to indicate where a hearing system is available.

Functional principle of an inductive loop system



### 4. Equipment

Equipment such as orientation and information systems, seating arrangements, public sanitary facilities and plantings should be accessible and usable for everyone and should contrast with the surrounding environment. The appropriate standards should be applied:

- DIN 18024 Part 1
- DIN 32975
- DIN 1450.

Basic principles:

Buildings and installations should be constructed according to clear organizational principles and marked by prominent reference points. Often simple elements such as plantings (contrast, smell), park benches, waste bins or post-boxes are enough to create a 'path' through a space. At a higher level, information pillars, sculptures and fountain systems can likewise be 'path-breaking'.

#### 4.1 Orientation

Orientation in public outdoor spaces should aim to be primarily intuitive. This can be done by drawing from the distinct character of a given square or architectural object.

##### 4.1.1 Visual design

(Section I, 2.1.2. Vision)

**Contrast, brightness, colour and shape** are the essential features of the visual design of our built and technical installations. Contrasting designs in public outdoor spaces not only increase the mobility of visually impaired people but benefit all users by facilitating orientation.

**Light density contrast** Light density contrast refers to the difference in brightness between an object and its background.

**Colour contrast** uses elements of colour to distinguish objects from their backgrounds and thereby provides additional information for orientation.

Light density and the creation of clear contrasts are further influenced by the surface quality of the selected materials: Broad differences in reflectivity of the materials produces higher contrasts when these elements are juxtaposed. Colour supports orientation. This is less due to the specific colours selected than to the contrast that arises through colour combinations. Selected colour

combinations must comply with the required contrast values. For an optimal design, DIN 32975 should be applied.

Contrasts can be verified in advanced by measuring contrast values. **The colour contrast value indicates the intensity of contrast.** The higher the contrast value, the more intensive and thus the more visible the resulting contrast will be.

The technical implementation of contrast under real conditions (e.g., the surface design of public squares) is dependant on the spatial contingencies and prevalent conditions on a given site. In addition to considering measured values from the laboratory, therefore, testing the colour contrasts of the different materials under 'real' conditions is highly recommended, including testing:

- Lighting conditions (daylight versus street lighting, sun versus shadows)
- Reflective properties of materials under various weather conditions (wet, slippery etc.)
- Dirt and wear on materials

Notes:

- A black and white photo reflects the actual contrasts.
- Combinations of red and green are not permitted to respect persons suffering from colour vision deficiencies (i.e., red-green blindness)
- On-site testing of samples is highly recommended for planning purposes!

**Orientation in public outdoor spaces may be adversely effected by competing contrasts, colour combinations and shapes!**

##### 4.1.2 Tactile design

(Section I, 2.1.2. The sense of touch)

When designing a surface, it is helpful for those with vision impairments and necessary for people without visuality to ensure that the selected material combinations not only create a sufficient contrast in terms of brightness but also feature a detectable **tactile contrast** in terms of surface texture.

Especially for public squares laid out at street level, a ground surface is required whose material and particular mode of installation can inform a blind or visually impaired person about the design of the square and how it relates to the neighbouring environment.

Familiar design elements and structures, such as paving stones or metal elements, are well suited to this function (Table 1).

Orientation aids or guidance systems for the blind which are intended to warn and guide people, should primarily be employed only where there is:

- A particular need for safety (areas posing particular risks)
- A particular need for systematic direction

Special floor indicators (floor elements with strong tactile, acoustic and visual contrasts marking the sedge) are designed to deliver targeted information to people who are blind (Implementing Regulation on Pedestrian and Bicycle Paths, DIN 32984). Consistency in how they are structured ensures recognition are is a prerequisite for their effective use.

#### 4.2 Orientation and information systems

Visual information and orientation aids should, in keeping with the Design for all principle, be simple, easy to use and easy to understand. Important information must be immediately understood, even by international users. Explicit orientation aids are required where:

- There is a complex environment
- There are unavoidable encroachments or boundaries that must be indicated
- User routes to bus and train stations, public facilities or other destinations must be marked
- Blind and visually impaired persons require reliable and specific guidance

#### Structural requirements

- Step-free and easy to access
- Tactile floor elements, particularly in the case of free-standing installations
- Unobstructed movement area (enabling individuals to come up close to, and, where applicable, under the element)
- High-contrast design in with respect to shape, light density and colour

DIN 18024 Part 1 includes measures that enable blind persons to recognise orientation elements quickly and easily. According to these specifications, such elements must:

- Extend fully to the ground
- Extend a maximum height of 0.10 m above the ground, or
- Be supplemented by a surrounding socket (tactile rail) of at least 3 cm height

#### Visual requirements

- Visible from the distance (appropriate height; where applicable with self-illuminating signage)
- Functionally correct position (recognizable and usable)
- Closed information chain (e.g., with signposts)
- Content reduced to the minimum necessary (description of designation, direction, distance to target as appropriate)
- Easily understandable, clear information
- Reliable information
- Legible information
- Design consistent with the planning area and systematic colour coding
- Clear, standardised symbols (pictogram)
- Positioned at eye level (ca. 1.30 m; between 1.20 to 1.60 m depending on the location)
- Glare-free lighting (Section III, 4.4.)

**Visual information should not be obscured by glare, reflection and shadows.** This can be achieved by choosing appropriate materials (e.g., anti-reflex glass) and surfaces (e.g., matte) and selecting an advantageous position (e.g., inclined). Where display cases are used, information should be mounted flush with the glass pane.

Different pieces of information should not overlap. This leads generally to confusion and disorientation. It is strongly recommended that informational elements be tested with the target group before putting them into service.

#### Graphic characters

- (Section II, 1.1.)
- DIN 1450

**Pictograms**

Pictograms are radically simplified symbols that are **understood internationally**. Pictograms alone are generally not sufficient as comprehensive information systems. In combination with additional information, however, they can effectively enable targeted and complex visual orientation.

**Tactile information** (Section II, 1.1)

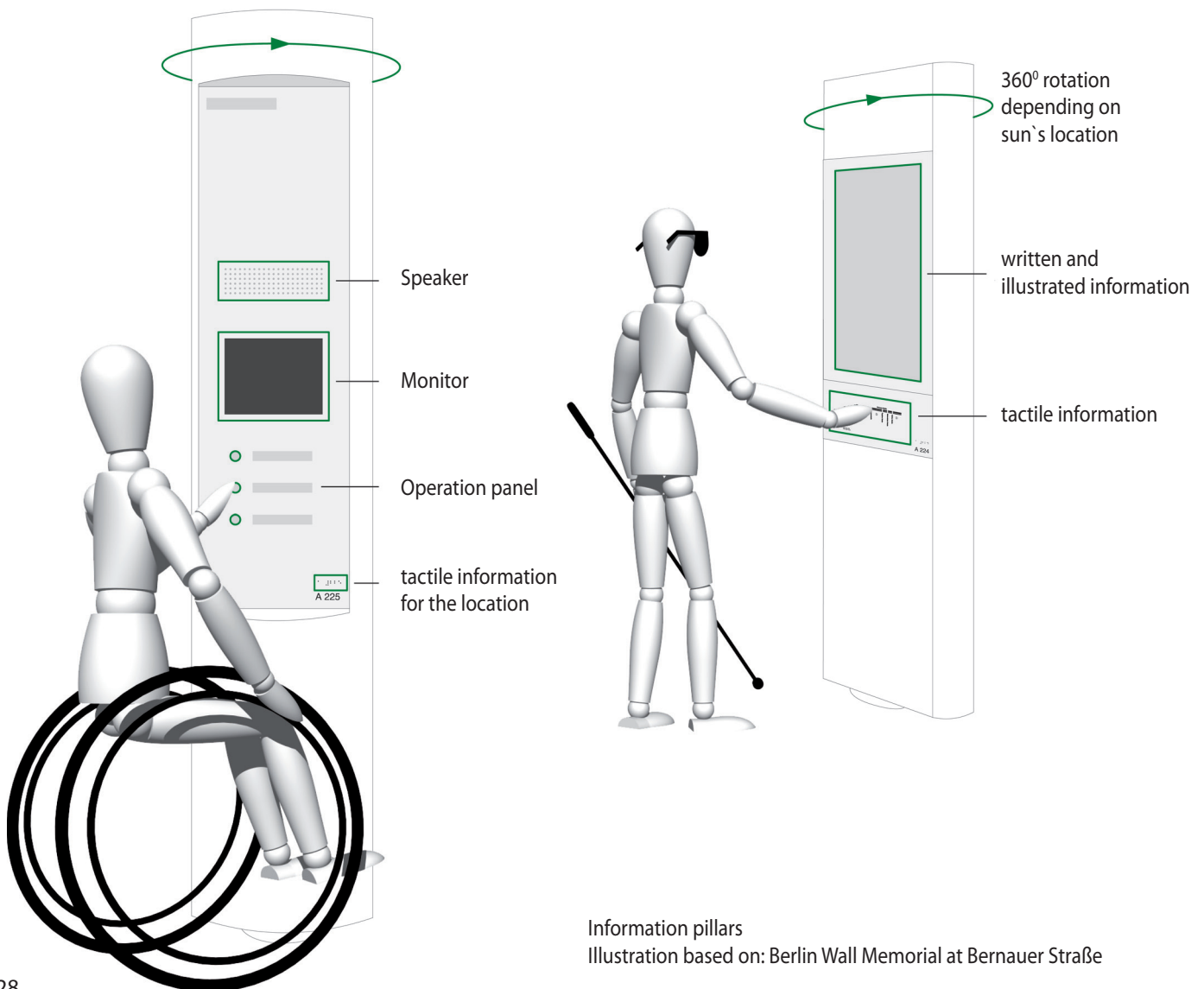
- Presentation in **Braille as well as raised letters** (and symbols), since not every blind and visually impaired person can read Braille
- Combinations of the above-mentioned types of writing
- **Modular building blocks** with three-dimensional elements with three levels of information: shape, colour and surface structure.
- Examples: figural depictions, building

floor plans, complex information and guidance systems and site plans (e.g., sites, districts)

- Highly detectable **tactile models** with simple, universally understandable design; positioned on steles or consoles with appropriate height and accessibility (Section II, 1.2.).
  - Examples: art object models, relief maps and architectural models
- Information about the models (e.g., title, name) should be added in tactile letters.

**Digital information**

offers flexibility in terms of communicating short-term visual or content-related changes, including intermittent presentations in the form of displays or projected figures. It is important to observe the two-senses principle, which means that information should always be conveyed visually and acoustically.



Information pillars  
Illustration based on: Berlin Wall Memorial at Bernauer Straße

### Displays

- High-contrast colours (e.g., light characters on a dark background)
- Characters adapted to local conditions (distance, height, surroundings)
- Avoidance of reflection and glare
- Where applicable, ensure open space for movement in front of the display

### Dynamic displays

- Avoid scrolling text
- Provide sufficient display time (for alternating displays, at least 5 seconds per figure)

### Information terminals and automated devices (Section II, 1.1)

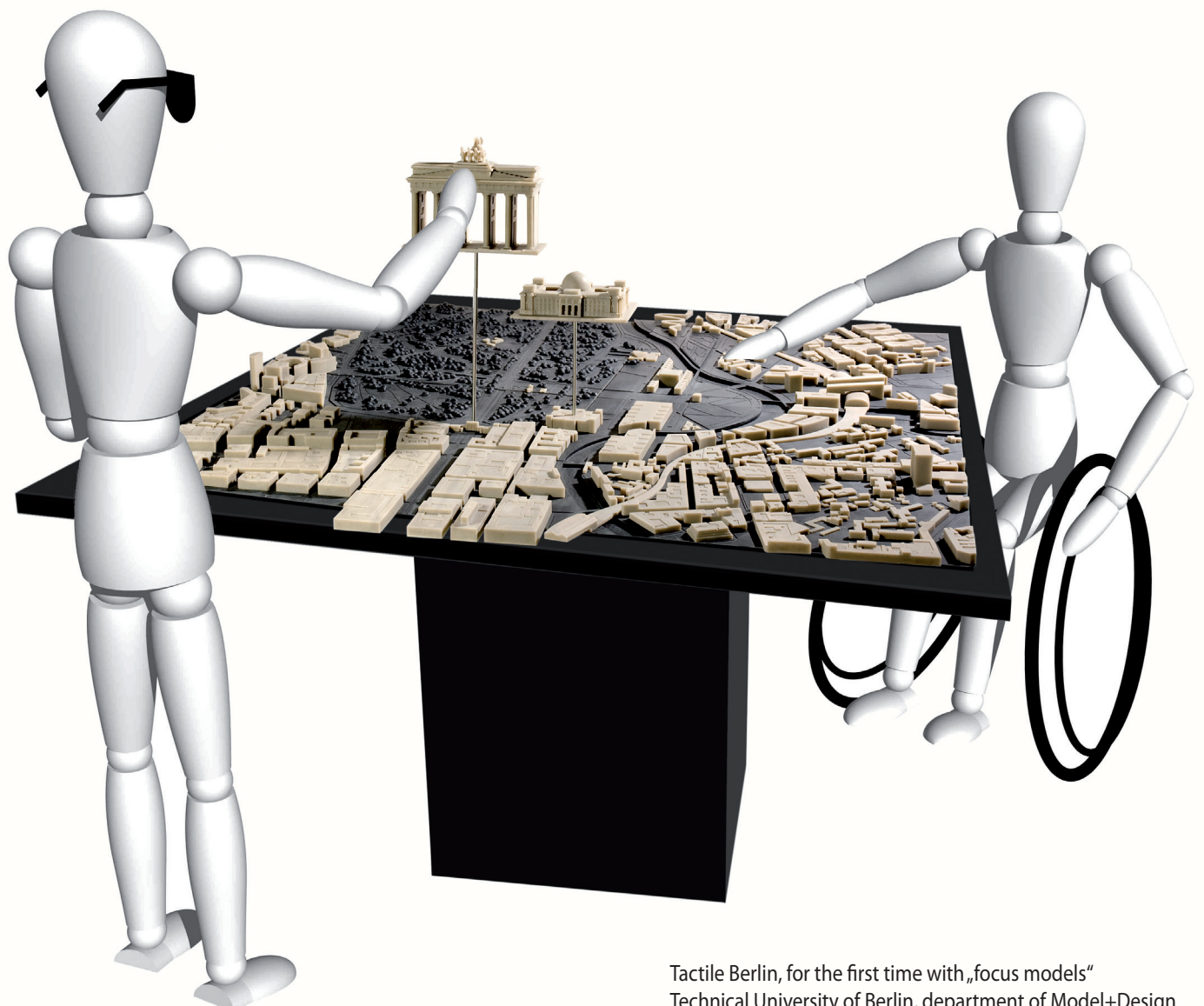
Detailed requirements and specifications for the design of barrier-free cash machines are outlined in the Circular WiTechFrau II F No. 2/2008 issued by the Berlin Senate Department for Econo-

mics, Technology and Women's Issues. These guidelines should be used as the basis for design.

### Acoustic information

(Section II, 1.4. and Section III, 3.5.5.)

- Comprehensible language (no dialect, no computer generated voice)
- Announcements uniformly audible throughout listening area
- Appropriate volume
- On-site testing recommended (filter out background noise with appropriate measures where necessary)
- High sound quality
- Uniform dissemination of visual and acoustic information from the same location (positioning)
- Acoustic signal to warn of impending announcements



Tactile Berlin, for the first time with „focus models“  
Technical University of Berlin, department of Model+Design

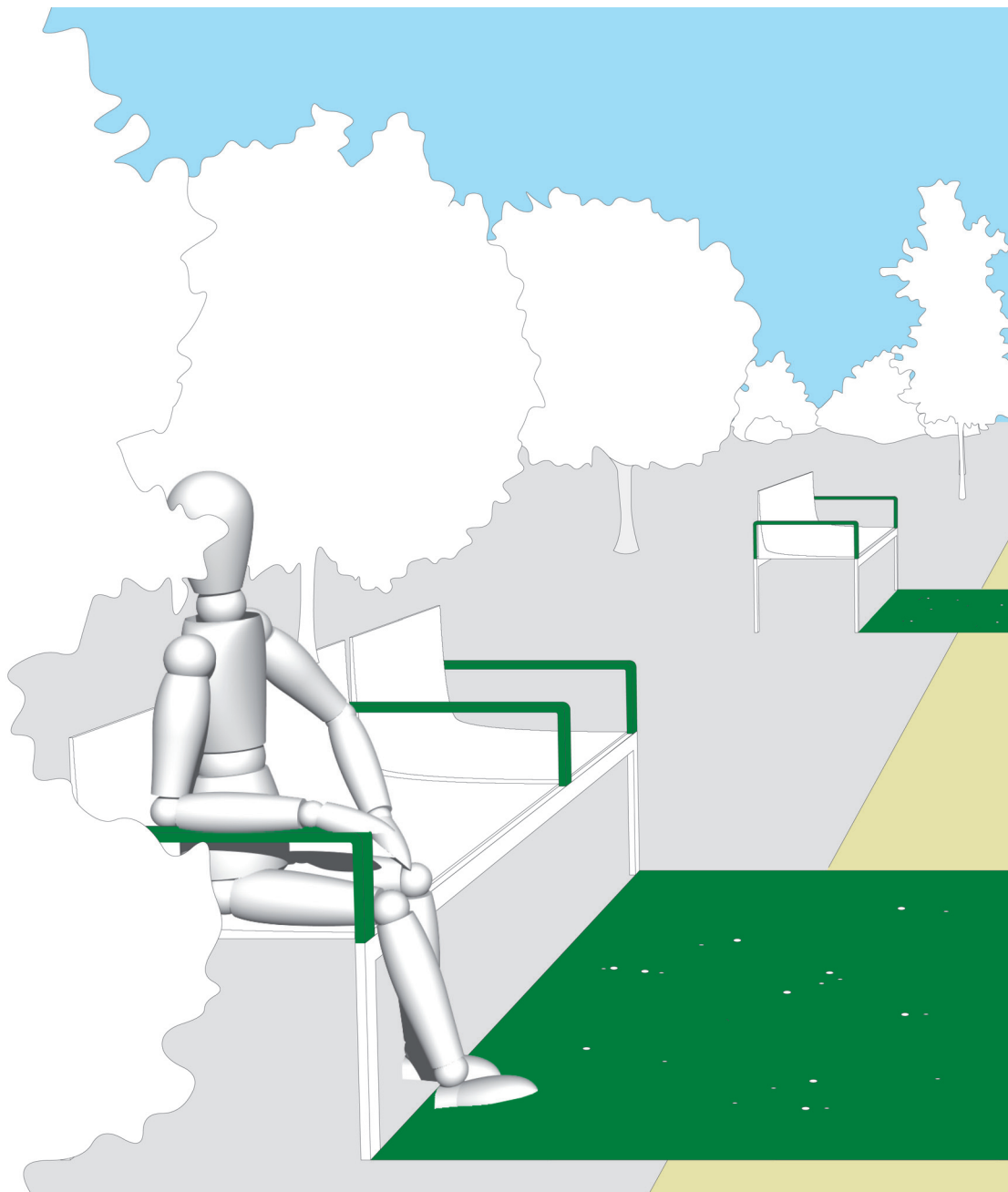
### 4.3 Resting areas

A resting area can fulfil diverse functions. It can be a place for meeting others, for people-watching or for taking a break. The arrangement and amount of seating in public outdoor space has a qualitative impact on how that space is used.

Seating arrangements with diversified designs (in terms of shape, colour, material) create inviting and communicative spaces for people to relax and spend time. Designs that are in line with the principles of *Design for all* work to the advantage of all users.

#### Requirements for seating arrangements

- Hard-packed surface
- Sufficient floor space (minimum width of 0.90 m) on either side as well as in front of seating (this is particularly important where situated alongside narrow paths or paths with substantial pedestrian and bicycle traffic)
- Wheelchair approachable from the front and sides
- Integrated into floor guidance system of visual and tactile contrasts
- High contrast with the surrounding space
- Ergonomic design
- No sharp edges
- Varying seat heights (ca. 0.45 to 0.47 m to facilitate sitting and standing)
- Level, horizontal seating surface



Quality of stay (sitting, lying, leaning)

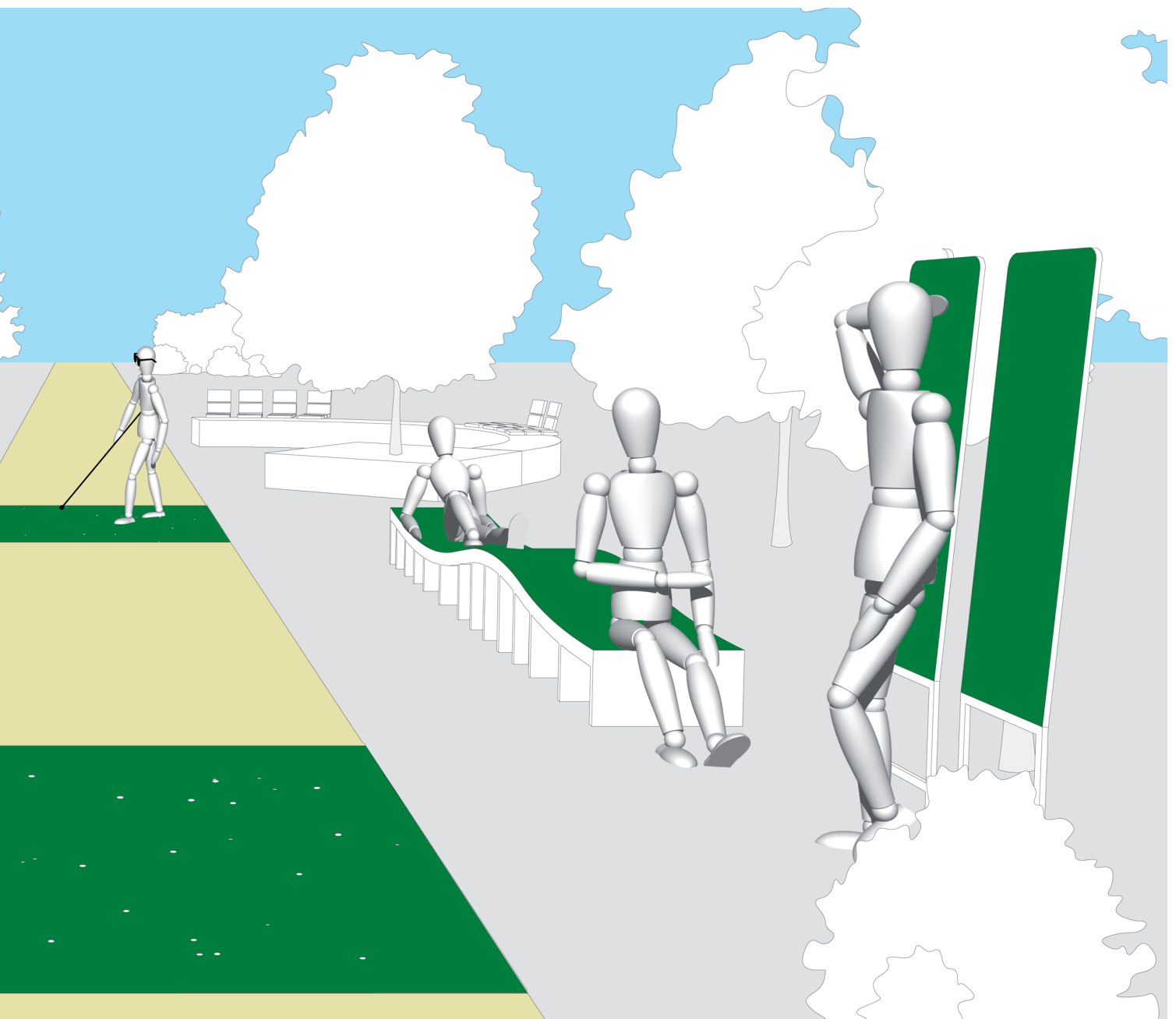
- Seating structure combined with arm and back rests
  - Armrests at a height of approx. 0.60 m
  - Combined with back rests as an alternative for persons with special physical needs
  - Stable and secure against tipping
  - Adequate knee clearance under tables and other furniture
  - Foot design of tables accommodates wheelchair use through one central table leg or, alternatively, 3 to 4 legs with at least 0.60 m distance between any two of them
  - Waste bins should not be placed directly adjacent to seating arrangements (maximum height of opening 0.90 m)
- The colour and surface structure are

significant in choosing seating material. Note that very light colours or high-gloss materials (metal, polished stone) may have a glare effect under certain outdoor light conditions. People should be able to choose between sunny and shady places; wind-sheltered areas should also be available.

### Public sanitary facilities

must be fully accessible and usable according to DIN 18040 Part 1, including:

- Entrance clearly visible from a distance
- High contrast design and access (tactile floor indicators)
- Barrier-free furnishings (Section II, 3.8.)
- Universal locking system (Eurokey)
- Lighting



### 4.4 Lighting

The Berlin Senate Department for Urban Development issued the Lighting Policy (*Stadtbild Berlin – Lichtkonzept*) in order to establish a comprehensive plan for lighting public areas in the city. Its goal is to provide a comfortable, adequate, differentiated level of illumination (i.e., brightness) that is responsive to economic, ecological and safety concerns and that also emphasises the distinct planning character of Berlin's street network and its neighbourhoods. A primary focus of the Lighting Policy is the illumination of pedestrian and traffic areas in Berlin. This planning document is supplemented by the Implementation Regulation on Public Lighting (*AV Öffentliche Beleuchtung*). The Implementation Regulation sets the parameters for planning lighting systems on public streets, including light intensity, light distribution and light density. Proper lighting is an important factor for traffic safety, public safety and orientation in public outdoor space.

#### Basic Requirements:

- Avoid glare in public space and buildings
- Position lights and spotlights to the side of tree tops
- Avoid optical distortion of objects accentuated by lighting
- Avoid the illumination of bodies of water, trees and shrubs
- Targeted lighting of junctions and traffic crossings (spots of more intensive illumination)

#### Traffic safety

- Sufficient lighting and balanced distribution of brightness (Implementing Regulation on Public Lighting)
- Good visual perception after dark
- Targeted lighting of junctions and traffic crossings (spots of more intensive illumination)

Maintaining an overall high level of lighting is not recommended for public outdoor space, since the brighter the level of light is, the longer the eyes need to adapt to changing light conditions (minimum level of brightness).

#### Public Safety

- Glare, strong shadows and dark zones should be avoided (prevention of 'scary spots')
- Ensure an evenly distributed minimum level of lighting for adequate visual

and spatial orientation and perception of detail, such that, for example, other people's facial expressions and behaviours can be seen from a distance of 4 m.

#### Orientation

- Sensible use of orientation aids through the integration of lighting elements (e.g., mark key routes away from traffic areas, or lighting of structural elements such as bollards and steps)
- High-contrast design of lighting elements (e.g., at the base)
- Balanced lighting to preserve the existing visual contrasts in the environment to support orientation after dark

#### Factors influencing light density:

- Surface materials (e.g., reflectivity, contrast)
- Atmospheric conditions (e.g., wet conditions)
- Light intensity distribution
- Positioning of light sources

### 4.5 Plants

Trees and bushes help to define prominent landmarks such as parks. Hedges and structural borders like surrounding walls should at least intermittently permit visual connection (at eye level, approx. 0.60 m). Pathways should be kept free from roots and branches (Clearance space, Section III, 5.2.1.).

#### Perception

The selection of landscape plants in public places should take visual impairments and different colour perception abilities into consideration. **Bright, luminescent colours** are preferred because they produce better contrasts and stand out more prominently against a green environment than dark-coloured plants. The **smell** of plants can provide visually impaired people with the experience of the natural world and simultaneously help them find their way in the space.





Even lighting of the pathways to support orientation.  
Illustration based on: Kolonnadenhof Old National Gallery and New Museum

### 4.6 Short-term installations

#### 4.6.1 Temporary structures

the leaflet on the *Erection and Use of Temporary Structures (2007)*, the Berlin Senate Department for Urban Development stipulates the following requirements. Temporary, or mobile structures like weekend or holiday market booths must ensure:

- Step-free access
- Portable ramps where steps are above 3 cm in height
- Visual and tactile floor indicators
- Minimum 2.30 m head clearance in sheltered areas
- No objects (e.g., waste bins, displays) in central walkways
- Counter service provided at a height of  $h = 0.80$  to  $0.85$  m; knee clearance =  $0.70$  m
- Visible showcases for saleable goods
- Service available from a wheelchair (communication)
- Movement area in front of the counter: minimum depth 1.50 to 2.00 m
- Movement area between table and chair arrangements: minimum width 0.90 m
- Provision of walking aids or wheelchairs; where applicable, provision of personal assistance
- Resting areas with seating
- Tactile and acoustic informational texts (e.g., during exhibitions)
- On-stage events: at least two places for wheelchairs; at least 1% of the total seating for audiences of more than 250 persons (Operating Regulations – BetrVO)
- Adequate view of the stage (Section III, 3.5.5. Hearing systems)

‘Ideal situations are wishful thoughts. But what would life be without dreams? There would be nothing like creativity, colour, warmth and working together - neither outside nor inside the public sphere in Berlin.’

Hannelore Bauersfeld, member of the working group ‘Barrier-free Construction and Transportation’

#### 4.6.2 Infrastructure in squares

The majority of events in public outdoor space require a temporary supply of electricity and water, particularly those taking place in public squares. Cables and supply lines often represent tripping hazards.

Basic principles:

- Do not lay cables across paths if it can be avoided
- Where it cannot be avoided, select less-frequented paths rather than primary routes for cabling
- Install cables as tautly as possible across the path
- Use existing trenches and hollows for laying and installing cables and then cover (route security)
- Lay cables along existing, permanent, linear-shaped structures (e.g., fences, booths)
- Booths, stages etc. should be positioned next to existing sources of power.

Examples:

- **Hose and cable bridge systems** (‘Yellow Jackets’): cable bridges should not be placed immediately adjacent to each other (tripping hazard created by the gap in-between!)
- High-contrast design (black-yellow, black-light metal)
- **Hard rubber-mats covering** that are not too thin or too soft (tripping hazards can arise from the raised indentation of the cable under the surface)
- The mat should be at least 1 cm thick to prevent it from becoming such a tripping hazard; longitudinal edges can be bevelled as necessary
- High dead weight
- Width approx. 0.50 to 0.80 m (depending on size and number of cables)
- **Timber planks are not a suitable cover** since they are not stable for walking and are difficult to use with a wheelchair or pram
- **Laying cable above the pathway** requires a minimum clearance of 2.30 m

In ideal cases, during the reconstructing or planning of new squares supply lines for electricity and water can be laid underneath the surface of the square to reduce the need for above-ground cable routes to supply of weekly open-air markets, for example (e.g., sub-ground electrical layout, automatically retractable device columns).

### 5.1. Living environment

The living environment connects all public outdoor areas in a city to each other. The public spaces of a city's neighbourhoods should guarantee unrestricted access for the use of all citizens. Families with young children and older people tend to prefer destinations within walking distance.

Neighbourhood-based activities strengthen social ties among residents and increase mobility. A fundamental prerequisite for these activities is the social integration of all people. The barrier-free design of the living environment makes that possible. Elements of this design include:

- Barrier-free access to squares, public green spaces and local public transport
- Barrier-free design of paths, stairways, inclined areas and lifts
- Barrier-free design of street equipment and furniture (seating and break areas, sanitary facilities) and parking spaces for cars and bicycles
- Accessibility of diverse sensory experiences (art objects, plants, water etc.)
- Clear orientation strategy through design with high visual and tactile contrasts (guidance systems, signage)
- Lucid, intuitive design
- Spatial diversity, incorporating areas for communication, exchange of visual relationships, personal retreat, sensory stimuli, games for young and old people etc.
- Safety
- Cleanliness (waste bins in rest zones and along pedestrian thoroughfares)
- No uncontrolled growth taking over planted areas
- Lighting available at least along pedestrian thoroughfares

The objective is to create simple solutions with a focus on a *Design for all* – not to generate a host of special solutions. This will benefit all users, regardless of age and gender.

#### Gender mainstreaming in public outdoor space planning

The basic requirements of gender-balanced planning include the equal treatment of both sexes, equal opportunities for all and also a consideration of the different living situations of men and women. Implementing these requirements in planning outdoor spaces means a design that ensures the equal appropriation of space by men and women and also preserves its

appeal for all users through the implementation of suitable design solutions. Factors to consider when planning a gender-balanced public space include:

- Different ways that men and women appropriate space with respect to the quality of time spent there and places created for communication and socialization
- Different functional demands placed on public outdoor spaces (e.g., rest and recreation, sport, recreational facilities for children, meeting points and communication spaces, garden and landscape experiences, crossing and transitional spaces in the city)
- Different needs for security and protection (visual connection to landmarks and lively places, areas that are visually accessible, lively traffic routes, lighting, cleanliness and safe play ground equipment)

### 5.2 Parks

Green spaces play a significant role in urban planning, particularly for densely developed inner-city areas. They reduce noise and fumes, increase the quality of life and promote a pleasant urban climate. Parks offer rich opportunities for leisure and relaxation within city neighbourhoods. They encourage communication and activity. Different user behaviours and safety needs call for designs that respond to the diverse needs of all user groups at any hour of the day or night.

Green spaces play an important social role as meeting points and contribute to social integration. Neighbourhood parks reduce inhibitions, and thereby promote active participation in social life.

#### Spatial diversity

is critical for user orientation. At the same time it gives rise to a variety of diverse spatial and experiential features that meet different user needs and interests. Such diversified design characteristics, however, require a clear design language to make parks easily comprehensible while also facilitating orientation:

- Variable network of paths
- Visual connection to prominent landmarks (tree groups, art objects, pavilions)
- Diverse places for spending time (Section III, 4.3.) with different possibilities to stay and relax

## 5. Selected public outdoor spaces

- Sensory experiences (plants, art objects, water)
- Barrier-free public sanitary facilities (Section III, 4.3.)

### Areas for adult activity

(e.g., motor activity park)

- Protected areas should be given preference to provide greater privacy
- Intuitive use of the equipment should be encouraged, with use of explanatory pictograms/symbols as appropriate

The *Design for all* approach recommends placing individual pieces of equipment in different sites (e.g., of a park) rather than concentrating them all within a single area.

### 5.2.1 Paths

DIN 18024 Part 1 provides guidelines for the design of paths.

#### Primary walkways

- Clearance: minimum width 1.50 m; minimum height 2.30 m
- Longitudinal slope: 3 to 4%
- Cross slope: maximum 2% with 1% recommended depending on path length, type of surface and user groups.
- Inclined paths should be laid out with intermediate landings at

regular intervals. These may, in exceptional cases, have a max. of 1.5% slope

- If the longitudinal slope is between 4 and 6%, break areas (possibly with seating) or passing areas (Section II, 1.2.) should be provided at regular intervals that integrate well into the site and have the required clearance and additional hand rail.

- Size of **passing areas varies with the number of users**

(minimum 1.80 x 1.80 m)

- Arrangement of seating
- Paths on sloping terrain should to prevent crashing and falls

#### Secondary walkways

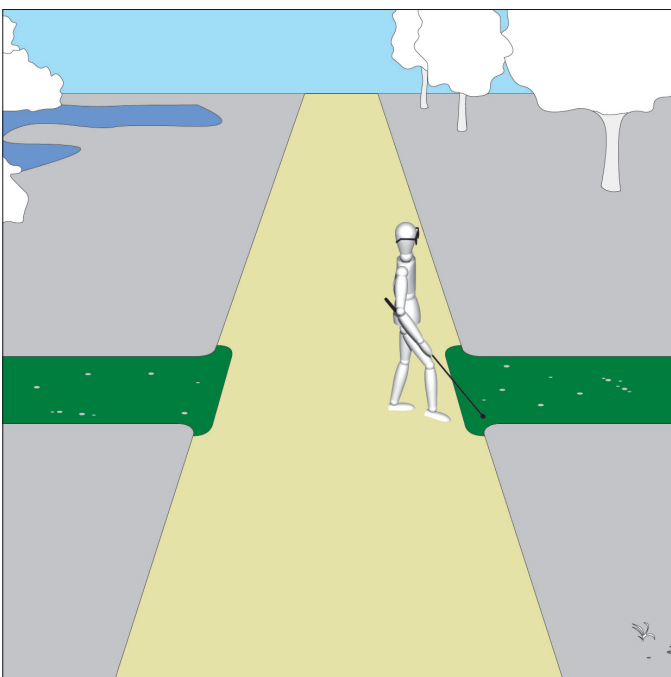
- Clearance: minimum width 0.90 m; minimum height 2.30 m
- Longitudinal slope: maximum 6%
- Cross slope: maximum 2% with 1% recommended slope, these vary according to the length of the path and type of surface
- Passing areas: (minimum 1.80 x 1.80 m) at regular intervals

#### Inclined pathways

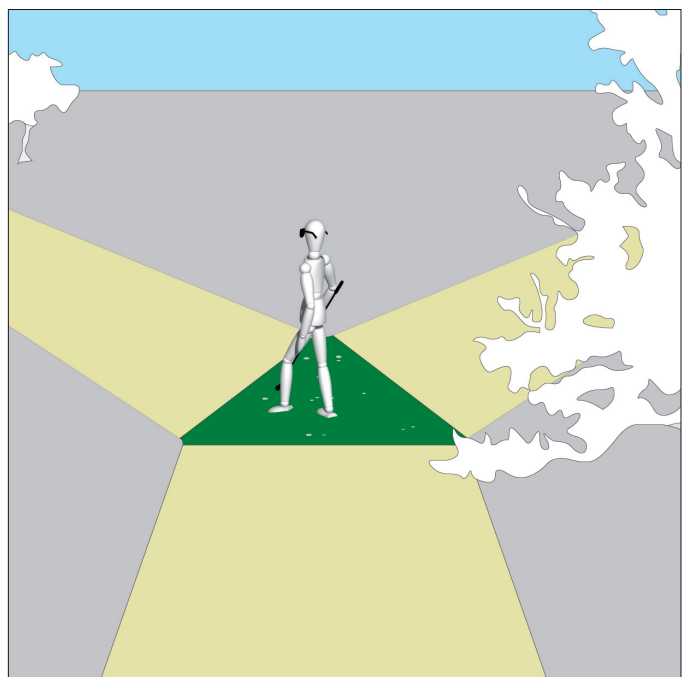
that are frequently used by cyclists or children (e.g., with roller skates) or persons with prams or pushchairs should be wider than the regulations require:

- Minimum width of 1.20 m;

Different orientation systems at path crossings



a) Distinguishable pathways and byways through different ground surface structures and colors



b) Junction area rich in visual and tactile contrast

- recommended width of 1.50 to 1.80 m
- Level areas should be provided at regular intervals; in exceptional cases with a longitudinal slope of max. 1.5% at a depth of 1.50 m and max. 2% at a depth of > 1.50 m

(preferably 1.80 m) for unrestricted use by wheelchair users or cyclists (turning radius)

**Surface materials**  
(Section III, 3.1.)

For safety reasons, paths with blind corners should be wider than the recommended dimensions in order to prevent unexpected collisions.

**Orientation**

Primary and secondary walkways should be **intuitively** distinguishable from each other. This can be achieved, for example, through:

The calculation of passing areas for inclined paths should be measured according to the space needs of cyclists who require a considerably larger passing area, for example, at the end of an inclined path (for change of direction or branching to the left or right)  
(Section III, 3.3.).

- Visual and tactile contrasts in the surface materials
- Changes in ground surface materials (e.g., at crossroads)

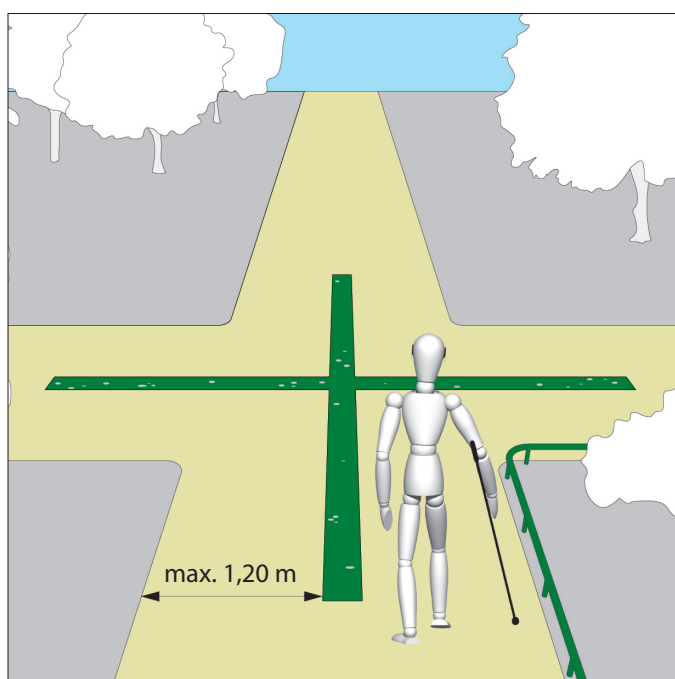
**Crossroads and junctions**

should be detectable both visually and tactilely (e.g., path surfacing, edging). Where a path includes a turn, it should have a minimum width of 1.50 m. For more acute turns, the following should be observed:

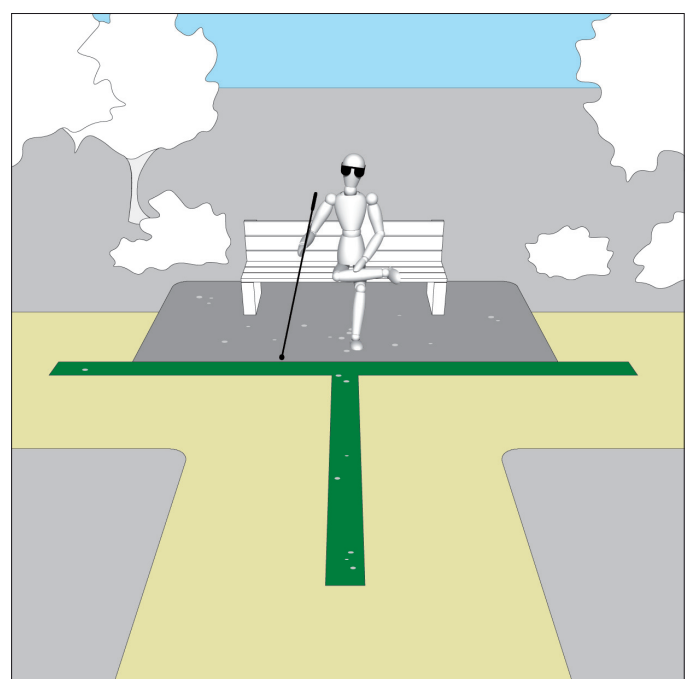
Uniformly designed, continuous borders on both sides of pathways create a valuable orientation aid, especially for blind and visually impaired persons using white canes. Some of examples of this include:

- Rounded or bevelled edges (not necessary where path borders do not have upstands)
- For paths with kerbstones, the minimum path width must be 1.50 m

- Kerbstones (minimum height 3 cm)
- Low iron railing
- Trench drains with solid profile
- Solid landscaping edging
- Dense plantings
- Strips of sand or gravel affording clear tactile and acoustic detection is a useful orientation aid for someone who people with visual impairments using a white cane.



c) Midway routing strips rich in visual and tactile contrast, pathway boundary (example: low ironwork fence - Tiergartengitter)



d) Identification of a rest area through visual and tactile contrast  
Guidance system leading to a bench

The following elements offer additional orientation assistance:

- A clearly intelligible design concept with respect to materials and furnishings
- An information and guidance system that provides clues about detours (e.g., at stairways and inclines) and wheelchair compatible access points (Section III, 4.2.)
- A tactile map (tactile model) next to pathways or landmarks (e.g., in parks)
- The demarcation of the objects in the environment by visually and tactilely detectable material changes in the ground surface material (e.g., 0.50 m strips on all sides)

Street furniture or other equipment should not protrude into the path.

### 5.2.2 Paths and bicycle use

Conflicts may arise where pathways are used jointly by pedestrians and cyclists. For this reason, it is essential to perform a thorough examination of the site to determine whether a joint usage of the path can be supported.

The examination should analyse:

- the path network of the park (path width, surface)
- the user groups (at different times of day, where appropriate, possible restricted use for cyclists where necessary)
- the traffic situation in the surrounding environment
- the proximity of particular sites (e.g., playgrounds, day-care centres, senior care facilities)

are essential. These studies should be tailored to the specific circumstances of those involved.

Visually impaired people may encounter particular conflicts and insecurities using pathways. It is of particular importance for these individuals that the walking area is clearly marked to ensure safe guidance. The attention of hearing-impaired people in particular must be drawn to the joint use of a path by pedestrians and bicycles by a warning sign. The speed of bicycles, for example, may be regulated by a more variable path network that avoids extended wide and straight sections.

## 5.3 Cemeteries

The requirements for barrier-free design of cemeteries must be adapted to suit the local conditions. Nevertheless, they should remain the basis for all modifications, even where compromises are unavoidable. The following section is

addressed to cemetery administrations and cemetery gardeners in addition to those involved in the planning process.

### 5.3.1 General design requirements

#### Access

- Entrances must be clearly recognizable from the road and from public transport stations (e.g., signage)
- Barrier-free access and link to main entrance
- Parking spaces available for people with impaired mobility (Section II, 4.2. Implementing Regulation on Parking Spaces)
- Ground-level entrances
- Tactile elements in the surface material for direction
- Visual contrasts marking entrances
- No turnstiles
- Path barriers (with low crossbar) must be passable by all users, including, for example, persons using a wheelchair (minimum clear passage of 1.30 m)

#### Orientation and information

(Section III, 4.1. and 4.2.)

Information boards in the entrance area should provide details on:

- Path network with primary and secondary paths
- Location of burial areas
- Location of entrances, exits and buildings within the cemetery premises
- Opening and business hours of the cemetery administration office
- Display cases (information mounted placed flush with the glass panel)
- Preferred option: weather-proof letter or relief plan placed in the entrance area (tactile model)
- High-contrast signage (e.g., junctions and thoroughfares)
- Free sightlines on primary paths and thoroughfares

#### Paths

(Section III, 5.2.1.)

- Hard ground surface (Section III, 3.1.)
- Closed surfaces used only where consistent maintenance of water-bound surfaces cannot be guaranteed or where the surface is used intensively (e.g., by maintenance vehicles)
- Paths should not be functionally compromised by surrounding plant growth

#### Equipment

- Gardening tools and watering cans should be stored in easy-to-reach locations (maximum height of 0.85 m)
- Wheelchair-accessible, easily loca-

- table water sources should be supplied directly next to paths
- Water taps should be in good operation and easy to use
  - Maximum height of the water taps: 0.60 to 0.80 m
  - Storage space for watering cans
  - Waste bins with opening to the pathway (maximum height of opening: 0.90 m)
  - Seating available (Section III, 4.3.) at least along main thoroughfares and in burial areas.

### 5.3.2 Buildings

Access to public buildings and their structural elements is subject to the provisions outlined in the manual *Berlin-Design for all: Accessible Public Buildings*. The following recommendations address to a barrier-free (re-)design of existing structures.

#### Stairways (Section II, 4.4)

#### Ramps (Section II, 4.3)

- Building entrance located a maximum height of 1.00 m above ground level; in other cases, mechanical lifting systems are the preferred solution (this also applies to the inside of buildings)
- Minimum ramp width of 1.20 m; with limited space 1.00 m is permitted
- Maximum 10% gradient for existing structures (e.g., portable ramp) only for very short sections (e.g., 1 or 2 steps); assistance service offered where appropriate

#### Lifts and lift systems

(Section II, 4.7)

- Lifting systems are particularly suitable for historical structures (e.g., protected monuments) since the overall impression of the building is preserved

#### Doors (Section II, 4.5)

#### Orientation and information

(Section II, 1.1)

- Comprehensive, tactile building plan with information on the floor plan, functional layout and system of paths.

#### Ceremony

Special requirements apply to the interior design of the ceremonial hall:

- Minimum distance of 0.90 m between permanently installed benches (adapt where possible)
- Benches with open side access to facilitate the transition from a wheelchair
- Space to turn and steer the wheelchair

(minimum 1.50 x 1.50 m)

- Appropriate but high-contrast design of benches
- Storage space for stowing, for example, wheelchairs and/or prams.
- Acoustics (Section II, 1.4.)

### 5.3.3 Graves

The options for re-designing existing burial areas to meet the relevant requirements for barrier-free access are usually quite limited. The following sections, therefore, refer primarily to the new laying out of burial sites.

#### Family burial plot

There are usually no paths in burial sites of this kind.

- The boundaries of the grave site should be indicated with strong visual and tactile contrasts (shape, material, colour)

#### Single row graves

The burial area is divided into sections by a subordinate path network. The individual graves or grave markers are arranged in a grid pattern.

- The boundaries of burial area should be indicated with strong visual and tactile contrasts

The movement area between the rows should fulfil the following minimum conditions:

- Minimum 0.90 m clearance width (e.g., for wheelchairs)
- Minimum 1.20 m for lateral movement
- Minimum 1.50 m for turning
- Environment should be structured by high contrast design (paths and burial areas)
- Hedge walls should be a maximum of 0.60 m for a greater visibility

#### Communal graves

are usually simply designed green spaces with a central memorial site.

- High-contrast design of the memorial (e.g., placement area);
- Visual and tactile accentuation in the area around the memorial site (e.g., floor routing elements).

#### Columbaria

are designed for the public storage of urns that are not buried.

- Urn hall (Section III, 5.3.2.)
- Urn wall must be easy to locate, have a high-contrast design and be approachable by wheelchair (movement area)

### Memorial grave sites

These sites honour distinguished citizens and must be clearly designated (Implementing Regulation on Memorial Grave Sites)

- Memorial graves should be indicated on the layout plan at the entrance

### Public memorials

are often similar to parks and public squares in terms of their diverse functional qualities. The following planning principles are therefore based on the specifications outlined in Section III of the manual *Berlin-Design for all: Public Outdoor Space*.

- Good, barrier-free access by public and individual transportation, with sufficient parking space and at least two parking spaces near to the entrance
- Level, non-skid surface design (Section III, 3.1.)
- Path guidance system including high-contrast floor elements and signage (direction signs) (Section III, 4.1. and 4.2.)
- Entrances marked by strong visual and tactile contrasts
- Comprehensible, tactile ground plan (tactile model) at least one located at the main entrance (Section III, 4.2.)
- Step-free access to the memorial site, or alternative flower placement areas where appropriate
- Inclined surfaces and ramps (Section III, 3.3.)
- Clear organization (e.g., of furnishings, plantings) should support orientation (Section III, 4.)
- Seating accommodation (Section III, 4.3.)
- Lighting (Section III, 4.4.)

### Garden monuments

Cemeteries with cultural-historical significance offer a variety of artistic elements, and examples of architectural and horticultural forms. Guided tours that focus special attention on tactile elements can make a visit to a historical cemetery a very unique experience for everyone, including people with a visual impairment.

## 5.4 Playgrounds

The educational mandate that issues from the UN Convention on the Rights of Persons with Disabilities (2009) states that children with disabilities should be educated together with children without disabilities. Public play areas should be brought in line with this principle. The Design for all concept envisions that all children and young people

have the chance play alongside each other and with each other. They must be afforded equal opportunities to play that are adapted to their unique abilities. Playgrounds must provide barrier-free access for children with special needs and accommodate the persons accompanying them (parents and grandparents among others). General planning principles are outlined in the Law on Public Children's Playgrounds (Children's Playgrounds Law) and the BauOBln Article 8.

Additional planning principles:

- DIN 18034 (applicable standard)
- DIN 18024 Part 1
- DIN 33942
- DIN EN 1176
- DIN EN 1177
- DIN 32975

The DIN standards represent the cutting edge of current technology and establish the groundwork for the following statements.

### Location and accessibility

DIN 18034 contains specific information on accessibility.

Playgrounds should be attached to parks, recreational and sports facilities to keep the children away from hazardous emissions and safety hazards (e.g., street traffic). Ideally, playgrounds should be integrated into a network of foot and bicycle paths. Barrier-free access to public transportation and pedestrian paths must be ensured.

### Orientation and safety

Entry and exit areas should be emphasised **to create awareness of when the playground area is entered and exited** (e.g., through colourful designs and a playful and child-friendly presentation). Acoustic indicators such as mobile sound elements also make it easier to find and exit the playground.

Placing a tactile orientation map for blind and visually impaired people at the entrance to the playground is useful. Elements on the map can then be found in the playground in the form of a guidance system on the individual pieces of play equipment. (Section III, 4.2.)

As a fundamental principle, the design of a playground should have a clear and intelligible path network and placement of distinct play areas. Different ground surfaces (colour, material) can help separate individual play areas to facilitate orientation.

Play areas for small children must be arranged such that children can be



observed at all times and must be equipped with adequate seating in the immediate environment.

Places to rest and shaded areas are important elements that promote individual comfort and communication among parents and improve the time spend in the space.

Playgrounds require an effective enclosure that separates the play area clearly from traffic areas and other safety hazards in public outdoor space and also prevents children from leaving the area unintentionally.

**Minimum requirements for playground equipment**

Movement areas::

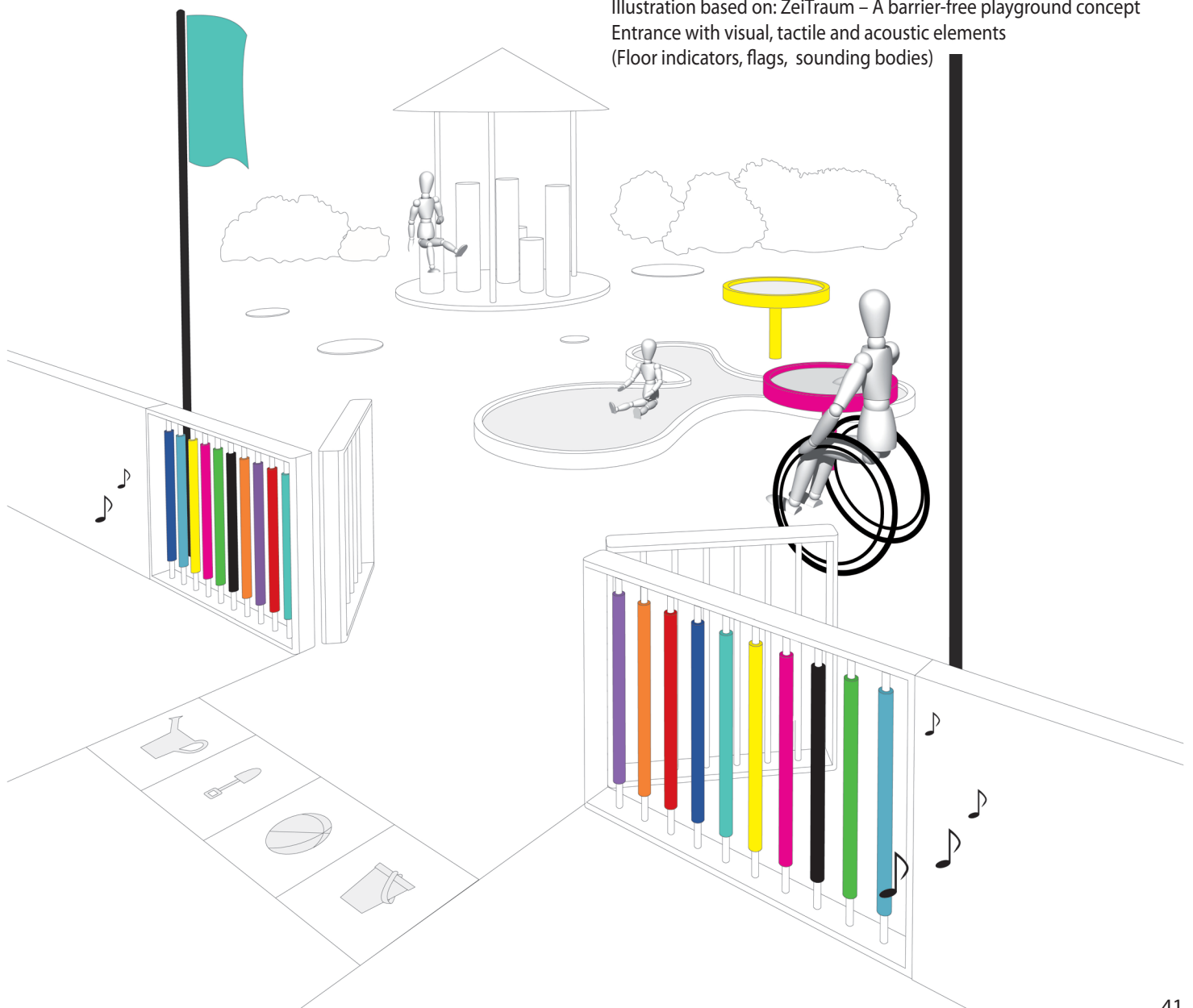
- Minimum 1.20 x 1.20 m between pieces of play equipment
- Minimum 1.50 x 1.50 m movement area to park or turn a wheelchair
- Minimum depth of 0.90 m in front of individual play equipment

Children using wheelchairs as well as children with full mobility must be able to move between play equipment without hindrance.

- Inclined surfaces and ramps with a maximum 6% slope and maximum 3% cross slope



Illustration based on: ZeiTraum – A barrier-free playground concept  
Entrance with visual, tactile and acoustic elements  
(Floor indicators, flags, sounding bodies)



- Adequate fall space, with a minimum width of 1.50 m (according to DIN EN 1176-1) and free from obstructions
- Fall spaces may overlap, incorporating movement areas (where ground surface conditions are the same)
- Eye levels (approx. 0.65 to 1.15 m) and arm lengths (approx. 0.35 m) should be considered
- Test for entrapment: DIN EN 1176-1
- Colourful, contrasting and ergonomically designed handholds and railings
- Rounded corners and edges
- High-contrast colour and surface structures
- Designed with high-contrasts and good visibility; possible separation of safety areas around play equipment and swinging accessories
- Seating should have barrier-free design (Section III, 4.3.)
- Diverse forms of vegetation

### Additional requirements

#### Relating to visual impairment or blindness

- Visual and tactile contrasts should be used to emphasise movement areas and danger zones (e.g., fall space)
- Orientation aids (strong visual and tactile contrast, acoustics)

#### Relating to restricted gripping ability

- Supportive backrests and alternative ways to climb on and off playground equipment

#### Relating to restricted mobility

- Short paths
  - The area around the play areas should be easily walkable and wheelchair accessible (Section III, 3.1.)
  - Additional climbing facilities, hand holds and supporting equipment
  - Consideration of potential uses from the perspective of a wheelchair user
- Depending on the size of the playground, at least one barrier-free public sanitary facility should be planned.

#### Integrative play facilities

A playground for all should include at least one integrative play facility for visually and/or hearing impaired children and children with physical or sensory disabilities that is compliant with their respective safety needs.

The requirements for barrier-free playground equipment are specified in DIN 33942 and DIN EN 1176.

Play equipment is recommended that can be used by children with a wide range of disabilities and is also attractive to all children. Another important

aspect to consider is usability and accessibility as it relates to adult companions of persons with mobility impairments.

Examples:

- Elevated table and sand play area with adequate knee clearance (approx. 0.70 m height, 0.30 m depth)
- Different ways to access slides at various heights and slopes with side access and exit points that facilitate transition from a wheelchair
- Play equipment for children who can not hang on to equipment by themselves
- Equipment accessible by wheelchair
- Combinations of play equipment (e.g., a spring rider, swing for children in a wheelchair, bird's nest swing).

Planning and design of playgrounds for all children should focus on solutions that promote integration – **not on individualized solutions for separate groups!** Some simple modifications or constructive additions to play equipment can be sufficient in themselves to create an accessible environment and enable the full participation of children with and without a disability in playground activity. Innovative ideas for the future development of playground equipment will certainly be welcomed.

## 5.5 Sports facilities

Indoor and outdoor areas should be designed so as to enable all users to participate in sports activities without barriers and restrictions, either actively (practising) or passively (as a spectator). The design of building interiors are subject to stipulations outlined in the manual *Berlin-Design for all: Accessible Public Buildings* (Sections I and II). In particular, Section II, 5.4.3. addresses the interior design of sport facilities. For the design of outdoor areas, Section III, *Public Outdoor Space* should be consulted. The following criteria must be taken into consideration:

#### Access to facility

(Section II, 2.)

- Parking spaces for cars and bicycles (Section II, 4.2. and 5.4., Implementing Regulation on Parking spaces)
- Level paths (Section III, 5.2.1.)
- Surface design (Section III, 3.1.)
- Entrance (Section II, 5.4.)
- General design elements (colour, contrast, material) supplemented by specific markers of site (e.g., floor indicators)
- Clear passage of minimum 0.90 m

- Changing rooms and sanitary facilities (DIN 18040 Part 1; Section II, 3.8. and 5.4.); use of Eurokey where possible

#### Accessibility

- Step-free entrance
- Stairways (Section II, 4.4., Section III, 3.2.)
- Ramps (Section II, 4.3., Section III, 3.3.)
- Passenger lifts (Section II, 4.7., Section III, 3.4.)

#### Sports stands (Section II, 5.1)

- At least 1% of visitor places (min. 2) located on even ground with adjacent seats for companion seating
- Seats with different viewing and sound qualities; different price categories
- Flexible seating (plug-in system)
- Visual demarcation of the route leading to the seats, clear passage of minimum 0.90 m
- Stair markings for ascending rows of seats, additional handrails as appropriate
- Railing height in front of seats maximum 0.90 to 1.10 m (to prevent falls); transparent design above a height of maximum 0.60 m to enable a clear view from a seated position.

#### Orientation and information:

- **Guiding systems** (Section III, 3.1 and 4.1)
- Signage (Section II, 1.1., Section III, 4.2.)
- Audio description equipment (Section II, 1.1.1.)

#### Acoustics (Section II, 1.4., Section III, 3.5.5.)

#### Lighting (Section II, 1.3., Section III, 4.4.)

## 5.6 Hiking trails

Basic planning principles are set out in DIN 18024 Part 1 on the design of paths. Designs should comply with specifications listed in Section III, 3.1. and 5.2.1. on barrier-free access to hiking areas. (Public transport, individual transport, guidance systems). Barrier-free access to hiking area should be guaranteed (public or transport, guidance system). Hiking trails for persons with restricted mobility should be clearly designated and permit independent use to the greatest extent possible.

### 5.6.1 Information, equipment and service

#### Information (Section II, 1.1., Section III, 4.2.)

- Information boards at the hiking area should include the following elements:
- Path lengths
  - Walking times

- Level of difficulty (topography, trail conditions, information on obstacles such as stairways, bridges, railway tracks etc.)
- Usability with wheelchair, alone or with assistance
- Suitability for electric wheelchairs
- Suitable for visually impaired persons
- Opportunities to take a break
- Barrier-free sanitary facilities

#### Tactile area map (relief plan)

- Large structures
- Limited to the most important details
- Minimal text within the map
- Symbols with legend
- Braille and raised letters

#### Along the hiking route

- Signs to destinations and interim destination points at regular intervals (direction, distance)
- Tactile information (Braille, raised letters), for instance, on the handrails along the paths
- Signposts that include information on gradient (e.g., average and maximum gradient) and pointing out alternative routes where applicable
- Tactile models, figurative drawings (e.g., of insects, plants)
- Audio stations (animal voices, audio images).

#### It is important to provide up-to-date, reliable information.

#### Equipment

- Rest areas with minimum amenities of one bench and one space for a wheelchair, bicycle or pram etc.
- Opportunities for resting
- Outdoor shelters (stair-free access, sufficient space for mobility aids etc.)
- Barrier-free sanitary facilities (optionally: Eurokey)
- Parking lot with barrier-free spaces, for example at the starting and end points of the trail

#### Services

- Indicate difficulty levels (e.g., for users of wheelchairs and hand cycles)
- Offer integrated experiential nature programs (e.g., nature trails)
- Provide audio books (audio guides) with directions and information about prominent landmarks along the trail
- Provide printed materials with stamped or relief print (e.g., site plans, floor plans, Braille)
- Provide barrier-free information on the Internet.

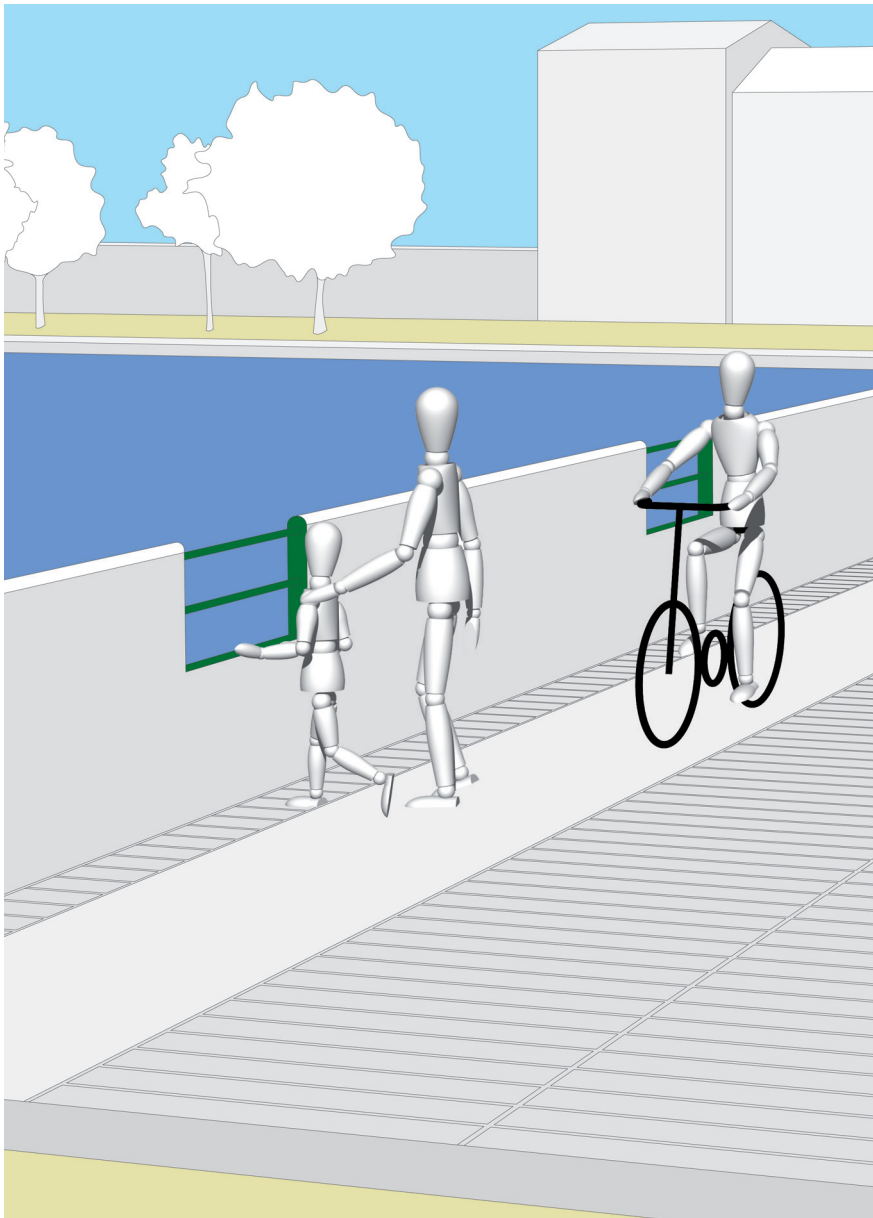
### 5.7 Waterfront locations

#### 5.7.1 Waterfront design

Access to and use of shorelines should be ensured at least in prominent locations, with a reasonable level of signage and appropriate boundaries to the water.

##### Accessibility and orientation

- Direct access to the shore depending on the design of the waterfront (e.g., via a path)
- Solid path surface appropriate to the natural site conditions (e.g., water-resistant surface)
- Barrier-free accessible timber walkways
- Kerb upstands, handrails or tactile



Partial opening in a massive bridge railing offer an open view.  
Ground surface rich in visual and tactile contrast

surfaces such as gravel or sand to draw attention to the waterfront and avoid unwanted contact with the water

- Fences as orientation elements
- Pathways to the shore should not lead along transverse gradients

In urban shorelines it should be possible to provide access the shore area while still providing a safe boundary. The following requirements and examples are intended to fulfil both requirements.

##### Boundary to the water

- Change in visual and tactile properties of the ground surface (e.g., strips of grass, sand or gravel marking sides of shoreline paths)
- Demarcation of boundary with dense plantings, a rail or a wall
- Ensure unobstructed view above a height of 0.60 m.

##### Built waterfront:

- Upstand (minimum height 3 cm) along pathways as a guide and boundary marker
- At minimum: routing strips (e.g., paving stones, drainage gutters, floor indicators) along the shoreline at an appropriate distance to the water's edge (approx. 1.00 m).
- Waterfront edge angled upward

##### Water access

- Openings or interruptions in the shoreline boundary indicated through visual and tactile contrasts (change of surface material)
- Fully accessible by wheelchair, minimum 1.20 m wide, with handrail for guidance and support
- Steps leading to water are marked with strong visual and tactile contrasts (**each step edge marked!**)
- Doors in the guardrail along the water should open towards the path rather than towards the water; open doors should not block the walkway (clear passage of minimum 0.90 m)
- Avoid steep pathways to the shore (maximum 2 to 3% gradient, handrails)

#### 5.7.2 Bridges and landing stages

##### Crossing

- Bridgehead should be clearly perceptible
- Step-free, visually and tactilely detectable entrance
- Solid, wheelchair accessible surface (Section III, 3.1.)
- Width of the crossing depends on intensity of traffic (minimum 1.50 m,

with 1.80 m preferred depending on whether or not the path is used jointly or separately by pedestrians and cyclists)

- Ramps used to compensate for differences in height with maximum 6% gradient, for bridges this can be a maximum of 8% as required by the local situation (Section II, 4.3. and Section III, 3.3.)
- Railings/handrails should contrast with surrounding; allow for unrestricted view above height of 0.60 m
- Closed railings should have partial openings

#### Underpasses

- Clearance: minimum of 2.30 m (Clearance, Section III, 5.2.1.)
- Low passage height requires high-contrast markings within the walking area
- Ramps with maximum 6% gradient, up to 8% as necessitated by the site conditions (Section II, 4.3. and Section III, 3.3.)
- Barrier-free walking trails along the shoreline (Section III, 5.7.1.).

#### Piers

- Marking and signage (Section III, 4.2.)
- Movement area in front of pier must be a minimum of 1.80 x 1.80 m; adapted to site demands and utilization, enlarge if necessary
- Secure boundary with the water (e.g., minimum upstand of 3 cm and high-contrast markings)
- Level entrance to watercraft, if necessary using access devices such as portable ramps, hydraulic lifting device or personal assistance.

### 5.7.3 Public beaches and open air pools

As a rule, public beaches and open-air pools and their various facilities must be accessible for and usable by all people.

#### Equipment

(Section II, 5.4)

The following stipulations apply to the planning or re-design of public open-air swimming pools:

- Parking spaces (Section II, 5.4., Implementing Regulation on Parking spaces)
- Entrance and cash area
- Changing rooms (Section II, 3.8.3.)
- Sanitary facilities (Section II, 5.4.), optionally: Eurokey
- Swimming pools

- Barrier-free beach chairs located directly on waterfront; accessible by wheelchair
- Beach bar: barrier-free access and design; boundary to the water
- Foot showers, comfortably usable by wheelchair users.

In general, handrails provide valuable additional support.

#### Access to beach and water

- At least one barrier-free access point with adequate signage
- Steep pathways to the beach should be avoided
- Heavy rubber mats or timber walkways leading to the beach for easier access of persons with restricted mobility and for tactile guidance
- Beach wheelchairs with balloon tires or aquatic wheelchairs

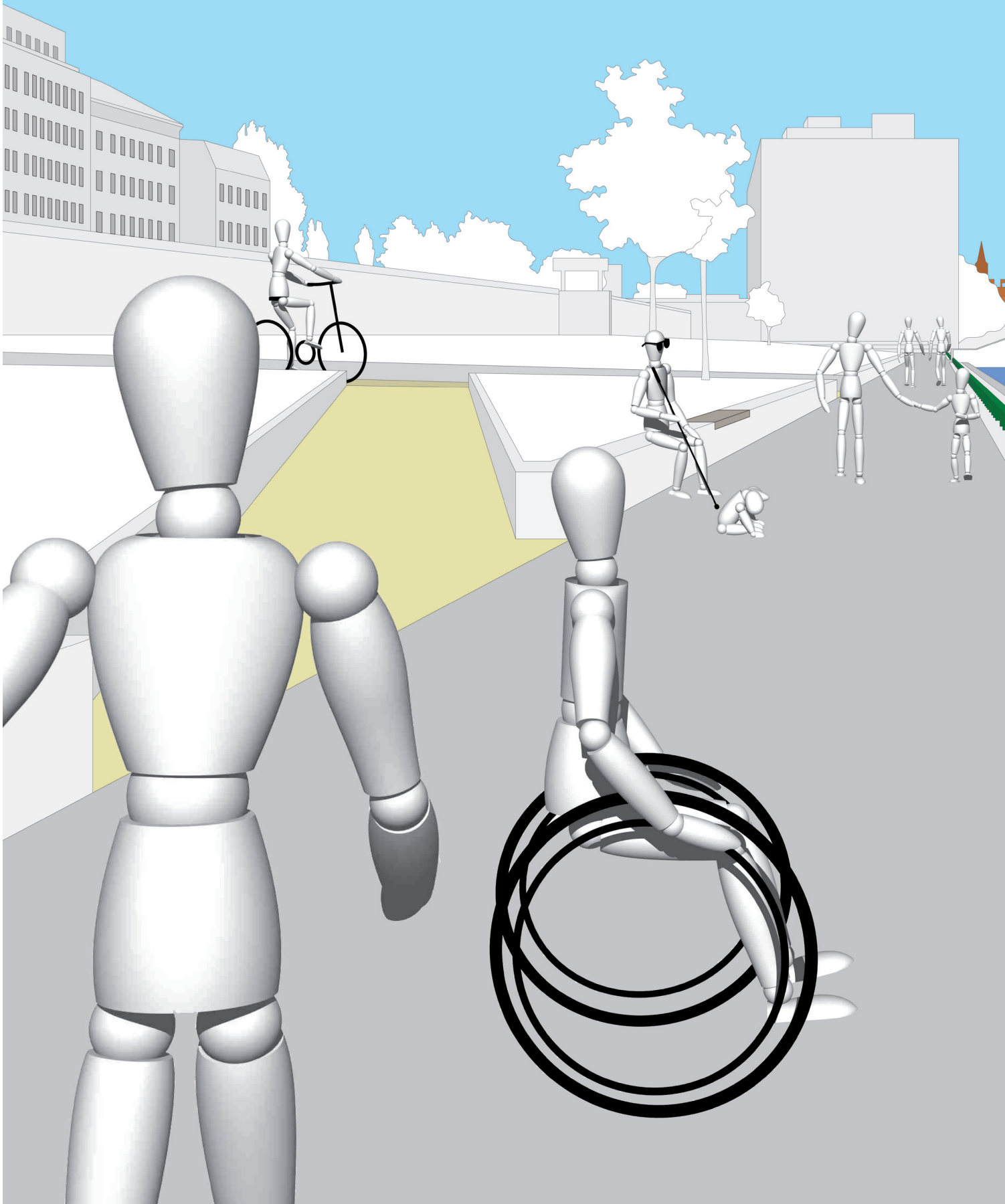
#### Orientation

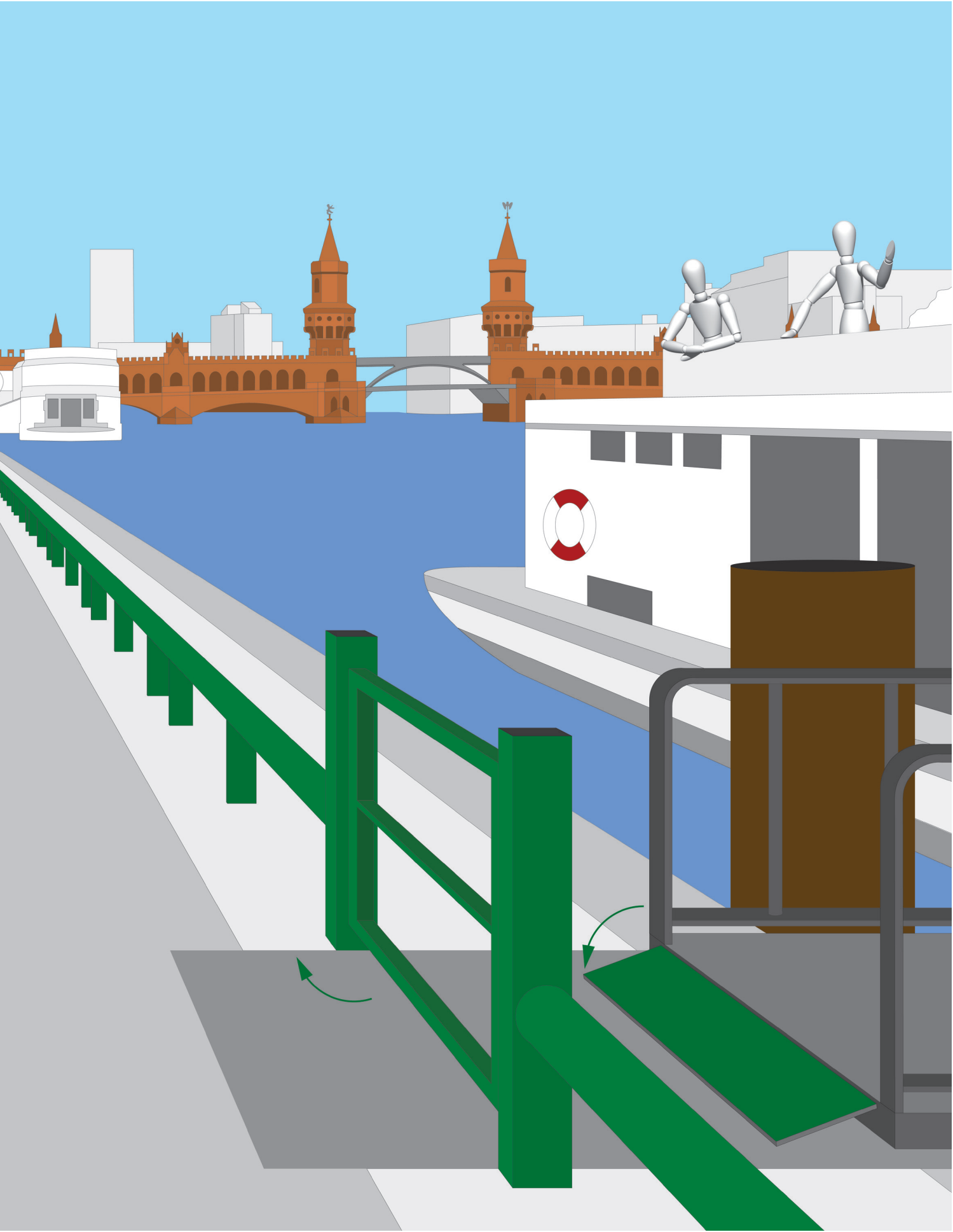
- Visually and tactilely detectable access to the shore
- Clearly identifiable and marked sections beach sections; particularly important for children and cognitively impaired persons
- Information about available services (e.g., beach chair or umbrella rentals, air station), emergency services as well as barrier-free restrooms should be visible and legible (Section III, 4.2.).

The *Design for all* approach will be an increasingly decisive factor in determining the quality of life in the city. Its requirements confront us with a truly challenging and worthwhile task – to radically simplify public outdoor space and invest it with user-friendly and intuitive characteristics.

## Public Outdoor Space

Jetty with boundary to the water rich in visual and tactile contrast  
Illustration based on: East-Side-Gallery





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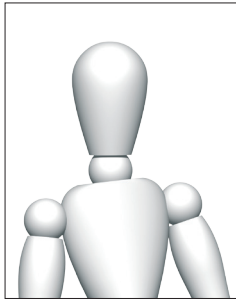
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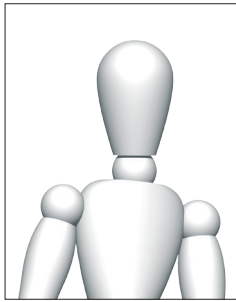
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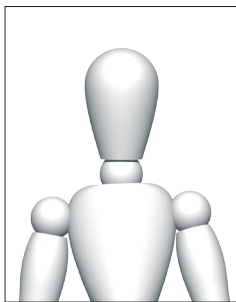
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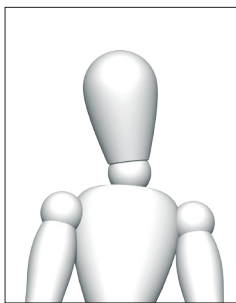
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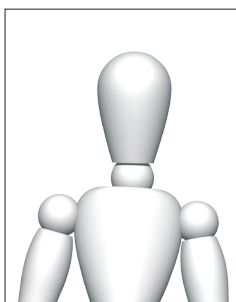
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