MODULE 3

AGE-FRIENDLY BUILT ENVIRONMENT – ARCHITECTURE

UNIT 2

MULTISENSORY ENVIRONMENT AND WAYFINDING

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DESIRE

DESIGN FOR ALL METHODS TO CREATE AGE-FRIENDLY HOUSING

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DESIRE will provide professionals in the building industry and home furnishings sector with the tools and skills to apply Design4All methods as an integral part of the design process, with the aim to create or adapt age friendly housing as a solution for the wellbeing, comfort and autonomy of the older adults or dependents at home.

The DESIRE training platform consists of six modules and 21 units.

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This unit provides an overview of the wayfinding methodology which should help course participants create a multisensory and legible environment that facilitates and supports the wayfinding process. It includes architectural and graphic design guides and improvements for building organisation and layout that support wayfinding. Application of this knowledge on the age-friendly built environment can contribute to a more pleasant and supportive living space for all generations.

2.1 WAYFINDING AND SPATIAL ORIENTATION

IN A NUTSHELL

Spatial orientation is a fundamental aspect for the survival of mammals. Human beings are characterised by their focus on their goals in life, be it in a physical environment or a virtual one. Since the specificity of the objectives may differ, it is necessary to use different expressions to describe this process.

2.1.1 Movement in environment

Movement in the built environment is a multisensory experience because people are an integral part of it, thanks to the multisensory perception through the use of a combination of several senses (such as sight, hearing, touch, smell) and perception of body movement.

Each of us knows the inconvenience of momentary **disorientation due to insufficient recognition of an environment** as a direct consequence of the failure of the process of finding the way. Spatial disorientation causes feelings of **uncertainty and has a negative impact on people's overall well-being**. To understand these reasons, we need to know the development of human beings and the cognitive aspects connected with orientation in space.

The prehistoric hunter sought to control the natural environment, following natural landmarks, animal tracks and their odour so as to avoid danger and obtain adequate food. The position of the sun, the moon and stars was a reference that offered information about time and space. Then, as now, **intuition helps when we lack information**. Success lies in making the right decision when there is not enough information.

There are two types of targeted human movement in the physical environment:

- navigation, the tracking of guided routes – the term also includes the science of directing a craft by determining its position, course, and distance travelled;
- wayfinding, the ability of people to regularly reach the desired destination, is considered a fundamental physical, psychological and social need that has a direct impact on people's autonomy and quality of life, their behaviour and comfort.

2.1.2 Wayfinding

The term wayfinding was coined by Kevin Lynch, an urban planner, in his book The Image of the City in 1960. In his research, he investigated how the characteristics of a built environment affect the way people recognize and remember features in it and how a person's whole sense of well-being is deeply attached to their sense of space and time. In 1992, Arthur and Passini described **wayfinding as spatial problem solving** consisting of three interrelated steps:

- **decision making** and the development of a plan of action;
- **decision execution**, which transforms the plan into appropriate behaviour at the right place in space;
- **information processing** understood in its generic sense as compromising environmental perception and cognition, which, in turn, are responsible for the information basis of the two decision-related processes (Arthur, Passini, 1992, p. 25)

We should perceive wayfinding as a necessary spatial problem-solving capability to reach the destination if there is no appropriate solution in memory. During the process, people follow strategies as algorithms, how to follow the way that leads to their desired destination. **Good wayfinding is clear, intuitive, and non-verbal**. This process is part of cognitive spatial skills and the results are mental spatial representations, called **cognitive maps**. The ability to focus mainly on important location information, which helps in wayfinding, is related to this topic.

According to EN 17210 – chapter 6, wayfinding is a system where suitable information is available to assist a person to move through an environment to a specific location. It is related to the features of the environment which help with:

- **orientation** – processing of information such as location and direction;
- **navigation** – planning and following the way, avoiding obstacles, etc.

From the point of view of education and professional training, the responsibility for designing space has always lain with architects or interior designers. They are supposed to provide architectural designs which include adequate wayfinding features and can then be enhanced by other disciplines. Even without interior designers or graphic designers, a good architectural design should communicate to users how to get through the building, where to go, and where not to go. Architects should also understand the neuroscientific aspects of perception to better understand the users

of the space. This is the reason why **this unit delves into those aspects of neuroscience, architecture, and perception that can assist in improving the wayfinding** and also the conditions of the personal experience of each user, their abilities, emotions, or skills. The application of this knowledge on the age-friendly built environment can contribute to a more pleasant and supportive living space for all generations.

The built environment should be designed, constructed and organised so as to aid orientation and navigation. The main principles that we will cover in more detail in this unit are:

- clear and comprehensible multisensorial information
- effective visual perception – good lighting and visual contrast
- tactile guidance
- logical, spatial organisation based on the appropriate design of key elements: approach, entrance and circulation system with sufficient amount of landmark points
- wayfinding signage – with appropriate design and placement

2.1.3 Cognitive accessibility

The term cognitive accessibility is commonly used by web developers. According to BOAI (Bureau of Internet Accessibility), the **term refers to inclusive practices that remove barriers for people whose disabilities affect the way they process information**. In architecture and design it is closely related to wayfinding – a **decisive characteristic of the environment which essentially determines the capacity for interaction and autonomy of each person and the chance for full social participation**.

The interplay between our cognitive abilities, the information offered by what we interact with, our background knowledge, and the circumstances of a particular moment may result in a positive inclusive experience or a situation of exclusion. Therefore, it is important to understand the principles of neuroscience, physical science, and biological science when designing an inclusive environment for all people.

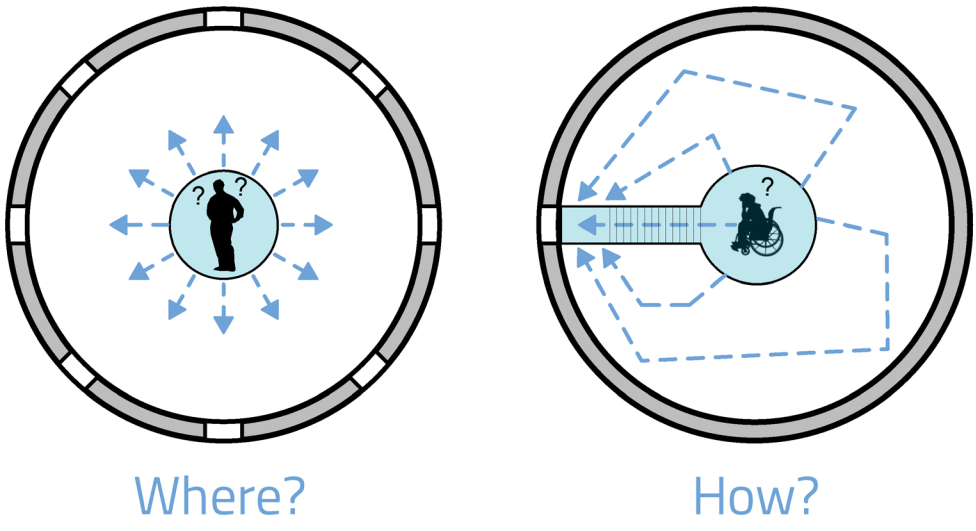

Figure 3.2.1 Difference between physical and cognitive accessibility (Kacej)

The design factors, fundamental in the cognitive processes, must be precisely identified and experienced to create a cognitively accessible environment, suitable also for the necessary conditions of physical and sensory accessibility. These experiences of satisfactory, effective, and successful interaction must be measured using a replicable and sustainable approach with respect to the capacities, expectations, and common and specific needs of the target population. The intrinsic simplicity or complexity of performing a task or process is also a factor that determines the challenge of cognitive accessibility, as well as how critical it is for each person to perform daily activities.

2.1.4 Functional ability

Functional ability is a **set of skills that enable people to perform daily activities without supervision or help from others**. It is an essential parameter that affects the quality of life the most. It is closely connected with healthy ageing, which the WHO described as "the process of developing and maintaining the functional ability" that enables wellbeing in older age. The better the functional ability – the higher the life expectancy. The World Report on Ageing and Health presents a framework for action to promote healthy ageing. New functional capacity concepts move away from the health or treatment models and bring them closer to comprehensive care, focusing on older people. What the report says about ageing can be applied to a set of all the people who, for some reason, maintain a situation of dependence on another member of society or who receive technical aids to preserve their autonomy.

2.1.5 Empathy and understanding

Empathy is the ability to understand and share the emotions of others and the basis for the experience and techniques of participatory design methods. Age-friendly design is based on empathy and understanding. The key is to engage the community and learn about their experience. Their comments implying disorientation could have several interpretations, and all could be valuable, as long as they explain and specify where disorientation points are.

2.1.6 Legibility

Legibility is **spatial organisation that helps to perceive and understand the environment**. It evolves through perceiving spatial information and processing it appropriately for the pertinent purpose. This essential quality of an age-friendly built environment is mainly determined by primary factors, the architectural design instruments, such as the building layout of the circulation space. In addition, helpful wayfinding elements such as graphical signage, among others, can be included as non-architectural instruments or secondary determining factors. Beyond the appropriate layout of the circulation system, all spaces or buildings must be designed to be legible. Their function is evident from their size, proportion, materials used, and furnishing. Thus, distinct and easily memorable places are created to help enhance the users' orientation.

In order to achieve legible space, it is necessary to design an accessible and supportive environment that allows perception and supports human spatial experience and promotes mobility and independence. In terms of navigation, a building should contain enough **landmark points** that can serve as navigational aids by providing a choice of points along a route. Familiarity with the environment is also helpful, which can be achieved by incorporating “known” landmark points or creating new ones life-based references of the user.

2.2 MULTISENSORY EXPERIENCE

IN A NUTSHELL

Architecture is often understood as a visual phenomenon; however, the opposite is true. If we use more senses for perception, the experience of space will be more intense. It helps to perceive the area entirely, subsequently creates a more intimate relationship between the perceiver and the environment and plays a crucial role in the perception of space by people with disabilities. However, it is necessary to avoid overstimulation as it harms the perceiver.

The main senses used in the wayfinding process are:

- sight is dominant because of its directional character, which can rapidly transfer information about colour or shape;
- hearing is omnidirectional, which makes acoustic alarms one of the most effective warning systems, it integrates and makes the space favourable;
- touch includes a perception of texture or temperature, it connects the body with its environment, and suitable ventilation and sunlight also stimulate the sense of touch;
- smell is immersive and helps associate space with smell, but it is only a complementary sense that streamlines the wayfinding process;
- taste is a sense that is not directly related to the human and space interaction, and this also applies to wayfinding.

References to architectural and urban designs that are perceived through senses other than sight should be used as a supplement and placed in key landmark points to support the wayfinding for people with visual impairments, e.g. tactile surfaces and objects or plants with strong scents and colours. These features are useful only if they are functional.

2.2.1 Sight

Sight is the dominant sensory organ in terms of the percentage of information received from the environment. Visual information is information that has been transmitted to the recipient through a visual experience. According to the VEF (Visual Experience Foundation) visual experiences are sight visits that incorporate memorable encounters and educational learning, thereby providing a robust experience that will live on in the individual long after they have lost their eyesight.

For an age-friendly built environment, the significant quality of accessible information is contrast. **Contrast helps** people, including those with partial visual impairments, **to move safely and identify elements** in the built environment. Some people are not able to perceive some or all colours. Most people, including those with partial visual impairments, are able to perceive light and darkness. The perception of visual contrast can be affected by the quality of the lighting. When designing visual contrast in the exterior, the weather and differences in daytime lighting should be taken into account. According to EN 17210, adequate contrast that supports wayfinding should be used:

- between **large areas** – floors, walls, ceilings or doors; contrasting floor patterns that **resemble stairs or holes** and overly decorative patterns **should not be used**;
- between the **door leaf and the door frames** – that includes interior and also entrance doors;
- between the **door leaf and the door fittings** – the door handle or lockset, if tactile interaction is needed;
- between the **wall and the railings or fittings in sanitary facilities**.

High contrast should be used to ensure identification of warnings and potential risks:

- such as windows, glazed facades and glass doors;
- at the edge of the stairs;
- as identification of potential risk – columns placed in the circulation system areas;
- high contrast of signs – information signs, instructions, door labels, etc.

2.2.2 Hearing

Hearing is the process, function, or power of perceiving sound, specifically the special sense by which noises and tones are received as stimuli. Perceived sound transformed into audible information is provided in the built environment to indicate potential risks, for emergency alarms installed in lifts, toilets or bedrooms and in addition to visual information. **Audible information has to be clear, unambiguous and easy to understand**.

2.2.3 Touch

Tactile information is the practice of encoding information that people can interpret through their sense of touch. It is used to provide accessible, safe and engaging designs. People with visual impairments rely on a range of **tactile environmental elements** in the built environment, such as **walls, edges, curbs and railings**. In addition, providing tactile contrast information allows the information to be perceived by touch, usually through fingers, hands or underfoot. A difference in floor surface, for example between grass and paving or between wooden and ceramic floor, can indicate the path to follow or delineate different zones.

Unless clearly provided by natural or building elements, such as a distinct natural edge or curb, warning, guidance, or information to people with visual impairments can be provided through a specific type of tactile walking surface, known as a **tactile walking surface indicator** (TWSI). It must be detectable via shoe soles and white sticks from surrounding or adjacent surfaces, and at the same time, must not cause undue discomfort when walking. **The TWSI must provide a visual contrast with adjacent surfaces to enable additional** identification; the surface must be non-slip and not glossy.

Examples of the use include a warning, when:

- approaching a pedestrian route to a pedestrian crossing where the sidewalk is flush with the road;
- when warning of obstacles on the route;
- when accessing stairs or an elevator;
- it is necessary to provide landmark points in a larger space (such as a square, a pedestrian zone, etc.)

2.3 SPATIAL ORGANISATION

IN A NUTSHELL

In the design of the architectural space, the concept of circulation systems is derived from the biological characteristics of people. Just as a human body in which blood does not circulate is not considered functional, a building in which people do not circulate is not considered functional either. **Spaces in which people move around** within a building **are called communication spaces**.

It is a concept of space between other spaces that has a primary interconnection function. Modernist architecture tended to concentrate on the spatial experience of architecture based on the movement through it. The Swiss-French architect Le Corbusier, one of the most influential architects of the twentieth century, called the concept of such an “itinerary” the Promenade architecturale, which is evident in his most famous works, such as Villa Savoye in Poissy or Villa La Roche in Paris.

Each space is accessible through a communication area that connects it with the rest of the layout. When we talk about the circulation system, we usually focus on the main layout, which means a set of interconnected spaces that serve the primary function of the building.

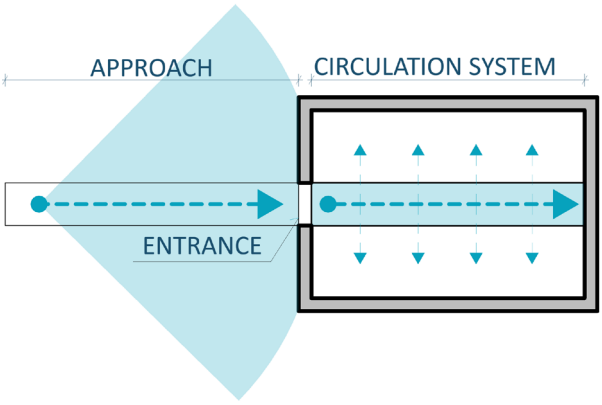

Figure 3.2.2 Three main elements of spatial organisation in terms of wayfinding (Kacej)

The **circulation system** of a building is considered a secondary or necessary part of the spatial structure. This is because it comprises a significant part of the floor area of the building, but does not serve a primary residential function. As a result, there are perceivable tendencies in architectural design towards **minimization of communication spaces** in terms of construction and economic efficiency. This is especially evident in apartment buildings, where the amount of communication space is usually minimized and the residential area of the apartments is maximized, thus economically efficient. This is especially true for multi-story buildings, where the vertical communication space is located in central partof the building, which includes stairs, elevators, and short corridors. Fortunately, this approach also has **positive aspects in terms of wayfinding** in the built environment. “The path of our movement can be conceived as the perceptual thread that links the spaces of a building or any series of interior or exterior spaces together.” (Ching, 2015, p. 252) We experience a space associated with the places we have been to and the places we expect to go to. The main components of spatial planning: **approach, entrance and circulation system** completely affect wayfinding.

2.3.1 Types of circulation spaces

Buildings with a larger and more complex layout are usually divided into several circulation systems. They have diverse interrelationships that may overlap, share common segments and entrances, or be completely isolated from each other. A suitable circulation system can be designed based on the adequate design of individual communication areas that must be defined in terms of basic characteristics, which are:

- **Availability: public, semi-public, semi-private, and private**. Availability does not mean accessibility, because a wheelchair-accessible ramp or lift can be private or public and at same time accessible. Public communication areas are always considered to have the highest usage, so they must be functional, aesthetic, durable, and accessible.
- **Direction: horizontal, vertical**. Horizontal routes represent the dominant movement without overcoming height differences. These include vestibules, entrance halls, corridors, galleries, and atriums. Vertical communication areas focus on overcoming height differences, i.e. vertical movement upwards or downwards. They include stairs, lifts, ramps, lift platforms, and escalators. Vertical communication areas ensure the interconnection of two or more spaces at different height levels.
- **Purpose of use: standard, evacuation, and service areas**. Standard communication spaces are those used predominantly and by the widest range of users. Evacuation routes are an addition to standard spaces and are supposed to ensure effective evacuation. Their primary goal is to provide the shortest escape routes that are identifiable, for example, in the event of a fire, according to applicable legislation and standards. Service communications are used to make the technical elements and equipment of the building available for operation, maintenance and inspection purposes.
- **Manner of movement: walking, moving in a wheelchair, by bicycle, or car**. The way of movement most significantly affects the dimensions of communication spaces.
- F**requency of use**: it can be a less frequent route or one used regularly. The frequency also affects the dimensions of communication spaces.

2.3.2 Graphical representation of communication spaces

Each type of communication space requires an adequate architectural solution. In architectural design, **communication areas are most often depicted in the diagrams with lines** ending in an arrow on one or both sides. This represents a stream, flow, or proposed interconnection of individual spaces. When designing a physical environment that is based on diverse circulation systems in terms of purpose, it is possible to use different colours to indicate for whom the communication space is intended. If the circulation system is based on different circulation systems in terms of the mode of movement, different types of lines are used, for example solid for pedestrian movement and dashed for cars.

2.4 APPROACH TO BUILDING

In a nutshell: As access to the building begins the process of finding a way, we can consider the arrival to the building as the **first exterior part of the building's circulation system**. Approach means exterior access to the building from a distance. The time required to access the building depends on the length of the access route, as well as the form in which we approach the building. Whether we walk or arrive by car or bicycle. In terms of the compositional solution of access to the building, we know three basic types.

- **Frontal approach** leads directly to the entrance to the building along a straight axis. The final visual goal of the approach is clear, whether it is the entire facade of the building or just a segment of it. Entrance is perceivable all the time while approaching the building.
- **Side approach** provides a better view of the façade and the shape of the building. The path can be redirected multiple times to delay and extend the approach sequence. If a building is to be approached from a far angle, the entrance should be projected beyond the façade or recessed so that it can be perceived more clearly.
- **Back approach** extends the approach sequence and highlights the three-dimensional shape of the building as we move through its perimeter. The entrance to the building can be observed at irregular intervals as it is approached so as to emphasize its location, or it can be hidden up to the arrival point.

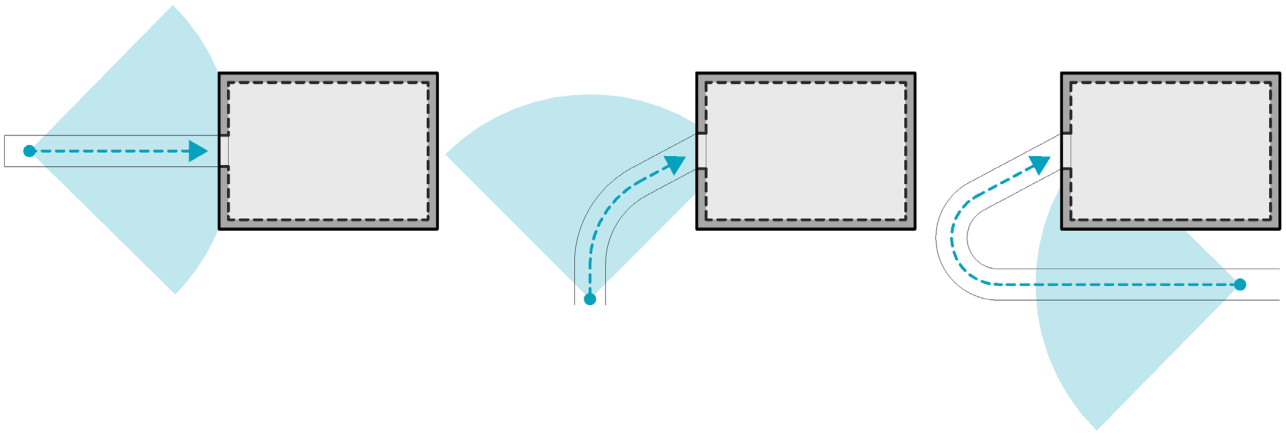

Figure 3.2.3 Types of Approach: Frontal approach, Side approach, Back approach (Kacej)

2.5 ENTRANCE

IN A NUTSHELL

An entrance to a building is the **boundary between the exterior and interior**. It contributes to the overall identity and plays an important role in visitor impressions and experiences. It provides a connection between a building's exterior and interior and distinguishes “here” from “there”.

The entrance should be designed so as to allow visitors and residents to easily find their way to the building and its surroundings. According to Francis D. K. Ching, we have three types of entrances: flush, recessed and projected.

- **Flush** entrance retains the continuity of a wall's or facade's surface and can be purposefully disguised – because of its sufficient plasticity, it is necessary to emphasize the flush entrance by its size, signage or additional construction of a shelter
- **Recessed** entrance provides protection from inclement weather conditions when you enter the building and it is a place to stand for the visitor while waiting for the doorbell to be answered. It usually has three solid walls, which increases the degree of intimacy and can have a negative effect with respect to increased crime risk in case the recessed entrance is deeper. In terms of wayfinding, the recessed entrance in the corner position is very effective – as it is perceptible from a wide range of viewing angles
- **Projected** entrance provides shelter, similarly to a recessed entrance, but offers a wide range of architectural solutions. On this basis, the degree of intimacy, clarity, security, perceptibility and design dimensions can be freely adjusted.

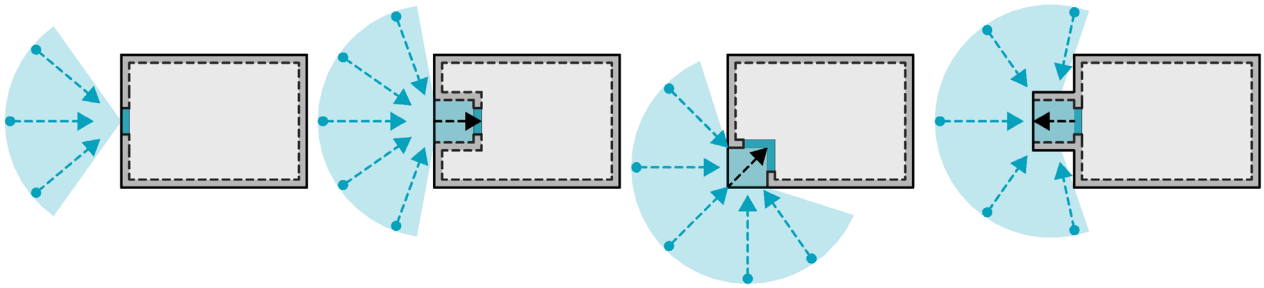

Figure 3.2.4 Entrances – Flush entrance, Recessed entrance, Corner recessed entrance, Projected entrance (Kacej)

Figure 3.2.5 Example of flush entrance, Haso – Helsinki (Čerešňová)

Figure 3.2.6 Example of projected entrance, Espoo – Helsinki (Čerešňová)

Figure 3.2.7 Example of recessed entrance, Tikkurila – Helsinki (Čerešňová)

2.6 CIRCULATION SYSTEMS

IN A NUTSHELL

A circulation system consists of a set of internal communication spaces and areas, mostly corridors. The circulation typology depends on physical specifications of circulation systems and can be divided into three primal forms: linear, focal and compound circulation systems.

2.6.1 Linear

Linear circulation systems support the wayfinding process the most. The primary organising element of such a layout is a line. The line can be straight, segmented or curved.

- Straight circulation system is based on a single main straight line, which is perceivable from each point of the line. It can be supplemented by additional secondary lines.
- Segmented circulation system consists of multiple segments – straight lines which are connected into one segmented line, which is not a perceivable whole. The places where the lines connect and thus change the direction of movement are natural landmark points.
- Curved circulation system is specific as it contains a slow and gradual change in direction. Compared to other linear circulation systems, it makes the wayfinding process the least easy.

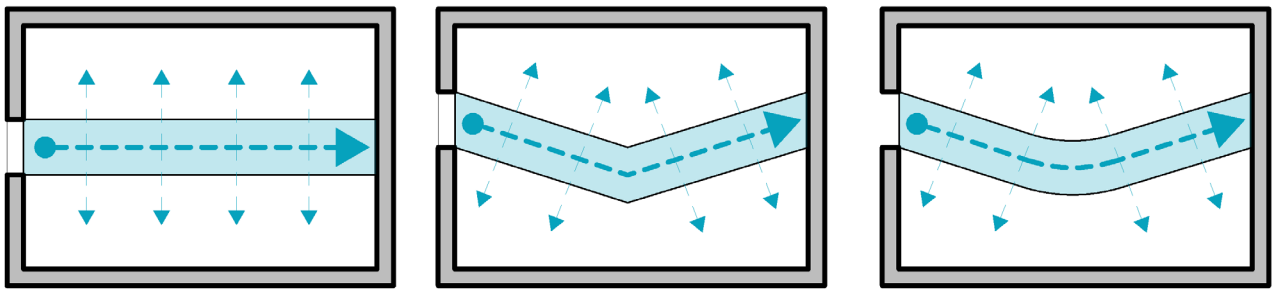

Figure 3.2.8 Linear circulation systems: Straight, Segmented, Curved (Kacej)

2.6.2 Focal

Focal circulation systems mostly comprise **circular layouts** with roundabout movement and with the **main focal landmark point in the centre of the layout**. There are four types of focal circulation systems with respect to perceivability and accessibility of focal points: radial, aatrial, loop and spiral.

- **Radial** circulation system has an **interior focal landmark point directly perceivable and accessible**, in the centre of the layout. All space units are organised directly around it and are perceivable directly from the landmark point. It supports the wayfinding process the most, but should only be used for **small scale buildings**.
- **Aatrial** circulation system has an **exterior focal landmark point directly perceivable and accessible**, in the centre of the layout, in the atrium. Remaining space units are not organised directly around the atrium, but around the interior corridor which is connected with the atrium through entrances or exits. This design is recommended for **medium scale building**, where thanks to the atrium it is possible to illuminate the interior of the building with natural light.
- **Loop** circulation system is based on a **concentric form**, where the **focal landmark point is neither perceivable nor directly accessible**. Space units in the centre are not suitable for a residential function, only for technical and storage functions, as they do not meet minimum lighting requirements. It is necessary to design additional landmark points which interpret segments of the loop, such as its start and end. If such landmark points are not included, infinite movement in the loop may cause disorientation. Loop circulation systems should be used for **large scale buildings**.
- **Spiral** circulation system contains **an accessible focal point which is not directly perceivable** if it organizes only one floor separately. If a spiral spatial circulation system is based on a single spiral that involves the whole building, and also includes the change in the height difference for the floors, it supports wayfinding and clearly explains the spatial structure of the building in the same way as a radial or aatrial circulation system. This system is rarely used in residential architecture and only in **large scale buildings**.

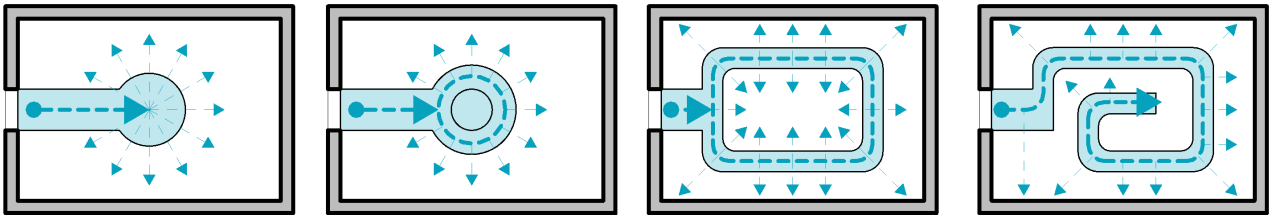

Figure 3.2.9 Focal circulation systems: Radial, Aatrial, Loop, Spiral (Kacej)

2.6.3 Compound

Compound circulation systems are the most complex ones and are only used in **extra-large-scale buildings**. They are rarely used in residential architecture, mostly in cases where several objects are organised into an urban structure.

- **Grid** is a **non-hierarchical two directional modular type** of a circulation system, based on intersecting sets of parallel lines. Usually, sets of parallel lines are regularly spaced and perpendicular, so the grid is based on the geometry of the square.
- **Network** is a hierarchical multidirectional modular type of a circulation system which consists of paths that connect multiple focal points.

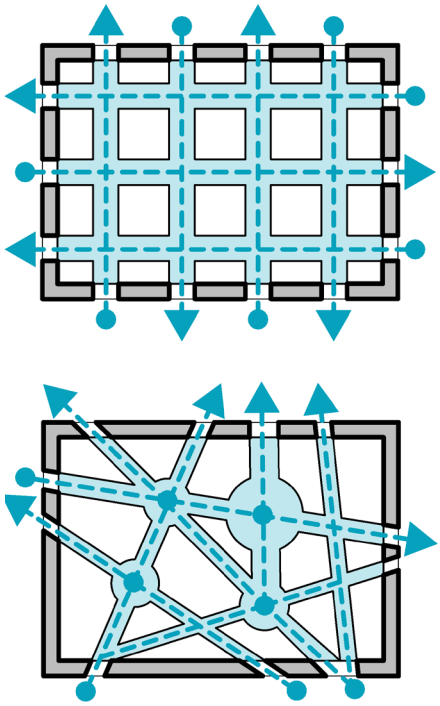

Figure 3.2.10 Compound circulation systems: Grid, Network (Kacej)

2.7 SIGNAGE AND GRAPHIC SYMBOLS

IN A NUTSHELL

The graphic orientation system and signage cannot compensate for the errors of an inappropriate architectural design of the building. The effort to supplement a large amount of graphic information in the environment actually has the opposite effect, resulting in a cognitive overload of the users, which reduces cognitive accessibility of a building. Signs can provide only additional information to help people to find their way. In addition to directing people to facilities, signs can also help identify accessible routes. The **signs must be easily read, understood, if necessary, raised in tactile and Braille**. The signs must be made of sturdy materials and be easily replaced, cleaned and repaired. Graphics, text, and icons on signs should be easy-to-understand and universally accepted.

According to EN 17210, the main types of signs are:

- **orientation**: sketches, plans, models, etc.;
- **directional**: directional information from point A to B;
- **functional**: explanatory information;
- **informative**: purely informative, for example a name;
- **signs for emergency exits**.

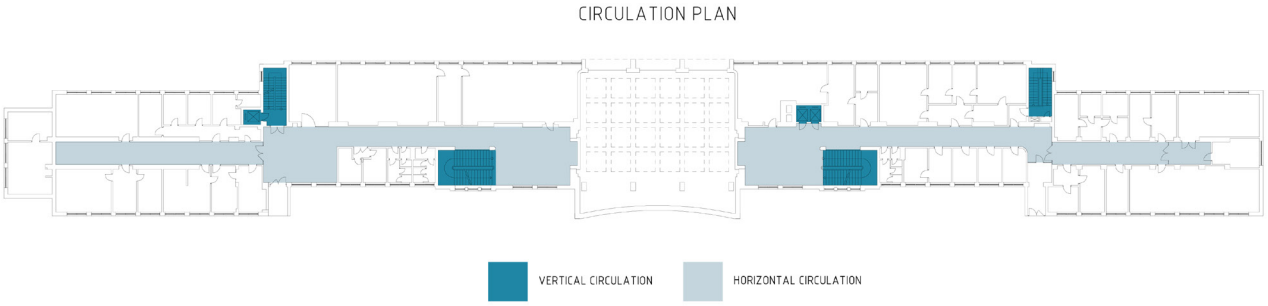

Figure 3.2.11 Types of signs – Orientation signage (Suláková)

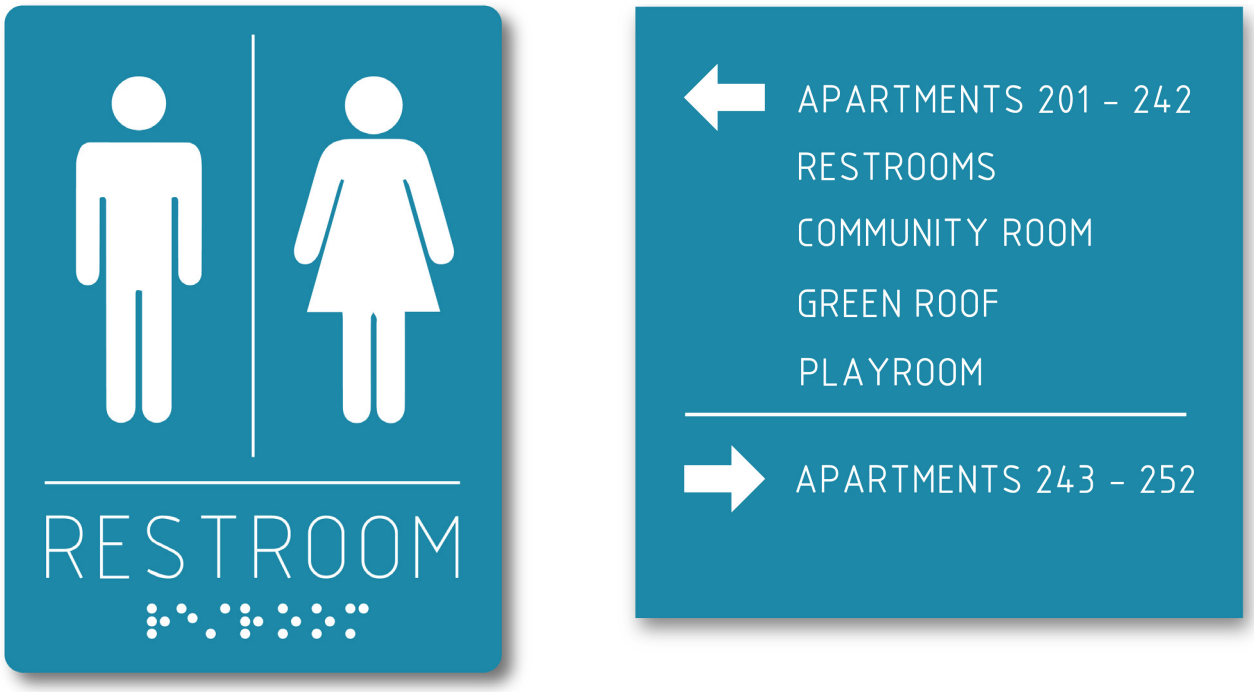

Figure 3.2.12, 3.2.13 Types of signs – Directional signage, Functional sign (Suláková)

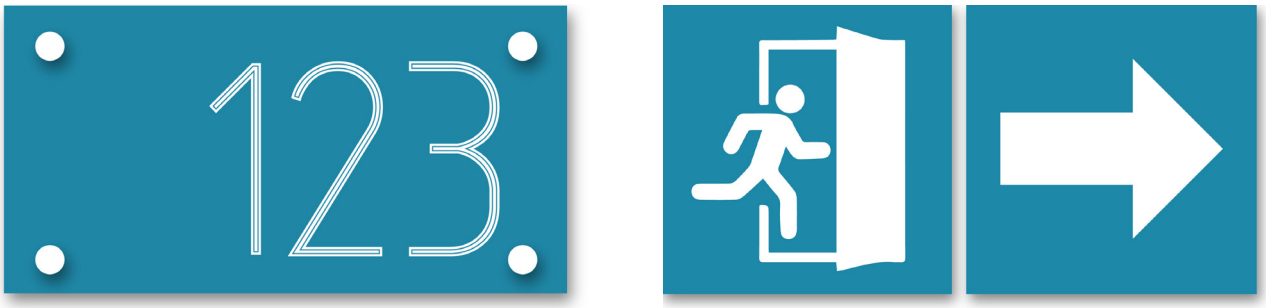

Figure 3.2.14, 3.2.15 Types of signs – Informative sign, Sign for emergency exits (Suláková)

Signs should be **located in a clearly identifiable and visible location**. The direction signs and plans of the buildings should be situated in accessible places adjacent, but not directly, to the main accessible routes so that they can be examined without disturbance and without any changes in the level of access routes. There should be enough space in front of the signs to accommodate people in wheelchairs, including people with companions, vision guides, and support dogs. With the manoeuvrability space of 1500 mm, people in wheelchairs can rotate and return to accessible routes. I**nformation and functional signs can be approached from a short distance** to read the sign. The **direction signs** should be located at the places **where the route decisions are made**, and they should be the logical direction sequence from the starting point to the different destinations. They should not be repeated too often, but offer the option to change the direction of movement every time it is possible.

- **Door information signs should be placed next to the door** and at the readable height on the latch side, so that raised tactile symbols and Braille information can be used.
- In all relevant areas of buildings such as corridors, directional signs for toilets must be provided.
- The **stairs must be equipped with information signs that identify all entrances and exits**. Where an alternative lift or ramp is not adjacent to the stairs, they must be clearly marked from the stairs.
- A **sign indicating the number of floors should be placed at the top and bottom of the stairs**, at the handrail and at least on one side of the outside frame of the entrance of each lift car. In addition, it must be displayed prominently elsewhere so that they can be seen from each level of lifts, if appropriate.
- Signs shall be located at a height where they are clearly visible to people who are seated, standing or walking – at a **height between 1 200 mm and 1 600 mm** from the floor or ground surface, in addition, signs should be at least **2 100 mm above ground**, such signs are mounted on ceilings or projected on walls in crowded areas.
- According to EN 17210, fonts should be sans serif type, for example **Arial or Helvetica**, fonts with clearly recognizable ascending and descending characters, with 20 percent of the height of the upper **letter. The letter height is at least 15 mm**, and the height increases with the distance of view from **20 mm to 30 mm for each metre**.

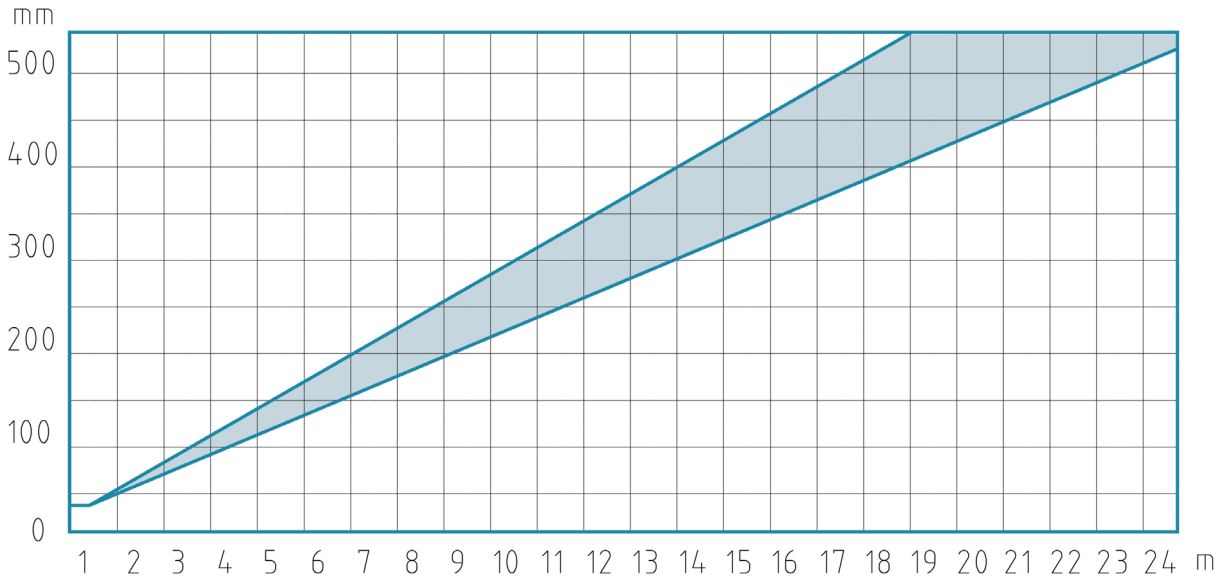

Figure 3.2.16 Ratio of the optimal height of the letters in millimetres in relation to the distance of the reader in metres (Suláková, according to EN 17210)

Graphical symbols or icons are useful in combination with signage systems, especially for people who struggle to understand the signage texts, for example, if the sign text is in another language. **The icon** can refer to specific components related to the facility's access, **has a high visual contrast and is well illuminated without glare**. The graphic symbols should be used on the direction and identification signs. When appropriate, the symbol must be tactile and accompanied by embossed letters or Braille on the direction signs and doors placed at an appropriate height, for a person to reach and read with their fingers. Internationally recognized symbols should always be used, especially in following facilities:

- accessible parking places;
- the access and entrance to the buildings without stairs, especially if not the same as the main entrance;
- lifting platforms or accessible lifts, if not all the lifts are accessible;
- locations where audible and tactile information is provided.

SUMMARY

Cognitive accessibility of the built environment can be explained as a decisive characteristic of the environment, which essentially conditions the capacity for interaction and autonomy of each person and the their capacity for to full social participation. Due to insufficient recognition of the environment as a direct consequence of the failure of the process of wayfinding, momentary disorientation may occur.

Good wayfinding is clear, intuitive, and non-verbal. The built environment should be designed in accordance with five basic principles to aid orientation and navigation: clear and comprehensible multisensorial information, effective visual perception, tactile guidance, correct spatial organisation, wayfinding signage with appropriate design and placement. The main components of spatial planning that mostly affect wayfinding are approach, entrance and circulation systems.

As access to the building begins the process of finding a way, we could consider the approach to the building as the first exterior part of the building's circulation system. Then there is the entrance, which is the boundary between exterior and interior. It contributes to the overall identity and plays an important role in visitor impressions and experience. A circulation system represents the composition of internal communication spaces and areas. Communication spaces are those which enable people to move around within the building.

The graphic orientation system and signage cannot compensate for the errors of an inappropriate architectural design of a building. The effort to supplement a large amount of graphic information in the environment may actually have the opposite effect, a person's cognitive overload, which reduces cognitive accessibility of the building. Signs can provide only additional information to help people to find their way.

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