Accessibility in public buildings

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Abstract

Equality is based on ensuring full participation of everyone to social and economic life, regardless of ethnic origin, gender, religion, age, disability or sexual orientation. In reality, the life of disabled is marked by social, physical and attitudinal barriers, that prevent ease of mobility, movement and access. European Concept of Accessibility (ECA) [1] based on Universal Design principles supports the creation of convenient, safe and enjoyable environments that can be used by everyone, including people with disabilities. In Universal Design, where the needs and limitations of users are unfamiliar, the construction professionals can learn a lot from the experiences of the potential user [2]. The paper presents the concepts of accessibility and the way in which accessible public buildings can be achieved in an equitable society.

Keywords: Equality; European Concept of Accessibility; Universal Design; Inclusive Design; Accessible public buildings, Accessible built environment

1. General aspects

1.1 Introduction

Nowadays there are approximately **650 million** persons with disabilities worldwide [3] that is 10% of the global population. An estimated **80%** of these persons live in developing countries. Statistics conducted in Europe, in 25 countries, on a sample aged 16-64 years show a total of about **45 million** people with disabilities [4]. One out of four Europeans said that a family member is a person with disabilities [5]. Disabled people, older people and persons with temporarily reduced mobility together make up 40% of the population of Europe. Moreover, according to UN figures, **34.5%** of the European population will be **aged 60+ in 2050** compared to **20.3% in 2000** [6]. In the context of growing diversity and a population in continuous aging it is necessary to design accessible built environment, in other words, spaces that meet people's needs, encouraging the respect that people have to pay towards the built environment they live in [7].

2. Concepts

2.1 European Concept for Accessibility [1]

The fundamental basis of a European philosophy for accessibility is the recognition, acceptance and fostering - at all levels in society - of the rights of all human beings, including people with activity

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limitations in an ensured context of high human health, safety, comfort and environmental protection.

The European Concept for Accessibility (ECA) is based on the universal design principles that rejects the division of the human population into able-bodied and disabled people and supports the creation of affordable, safe and enjoyable environments use by everyone. ECA is the tool used to order and give shape to the environment, so that it becomes suitable for all users. Thus, the European Concept for Accessibility has to be a basic guideline to everyday working to all those people and bodies who are involved in building the environment - like politicians, local and national authorities, construction firms, entrepreneurs, designers, employers.

2.2 The concept of „Universal Design"

The concept of "Universal Design" was first developed in the U.S. in the 60's by the architect Ronald Mace, afterwards being taken over by the European Commission under the name "Design for all".

Universal Design seeks to integrate and accommodate disability, using basic design concepts, by sensitising the environment to the broadest possible range of bodily shapes, sizes and movements [2]. The objective is to draw attention away from people's impairment and to minimize social ostracism. It is recognized that people's needs are not static and that the design of buildings and other products should enhance and not inhibit "changing abilities of humans throughout their life-span" [2].

Universal Design has 7 principles: simple and intuitive use, equitable use, perceptible information, tolerance for error, flexibility in use, low physical effort, size and space for approach and use [2].

The principles of Universal Design are important, in seeking to restore disabled people's self-esteem, dignity and independence, while encouraging the development and implementation of a friendly design.

2.3 The concept of „Inclusive Design"

Inclusive Design [2], branch of Universal Design is more than a technical response to the needs of disabled people bringing forward the dialogue between designers and users. **It is an idea that seeks to prioritise the users views and values** and to challenge the social, institutional and technical relations into the design process.

The real need to consult the opinion of people with disabilities in the design process, resulted in the establishment of access groups, an example being "The City of London Access Group" (Fig.1), established in 1988 with 40 members [7].

Fig.1 The logo of "The City of London Access Group"[2]

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3. Accesible built environment

Built environment is created or modified by man in order to ensure the possibility to develop various human activities.

Construction is closely related to the notion of accessibility, which is acting directly on certain categories and elements of built environments that are under legal and moral obligation to be accessible.

Built environment elements that fall under the notion of accessibility are: public buildings (administration, health, commerce, culture, transport, tourism, religion, education, sports...), residential buildings, historic buildings, archeological sites, streets, alleys, squares, parks and green areas, parking, playing grounds areas, beaches, nature reserves, transport etc. [8].

Within these, the elements that fall under the notion of accessibility are: doors, windows, corridors, elevators, lifts, handrails, lighting, ramps, stairs, sidewalks, alleys, pedestrian crossings, public spaces, public transport facilities etc. [8].

All these must be designed / renovated in order to facilitate their access and unrestricted use by all users, regardless of disability.

3.1 Fundamental criteria for an accessible built environment [6]

The main objectives in making a built environment accessible are:

- Providing means for achieving spatial **orientation** adequate to all users, outside and inside buildings, through proper functional organization and the use of accessible signage, adequate way-finding and information systems.

- Providing means for achieving equal and unrestricted **mobility** to all users, outside and inside buildings, especially in terms of vertical and horizontal circulation, spatial parameters of the spaces and facilities, site topography, adequate lighting level, selection of the adequate finishing materials.

- Providing means for achieving safe **evacuation** conditions from the buildings and from the outdoor facilities for everybody, having regard to their motional possibilities.

- Providing means for assuring everyone's **dignity** in terms of creating the adequate conditions for personal hygiene in the inner spaces and in the use of the outdoor facilities.

4. Recommendations for accessibility of public buildings [8, 9]

For the accessibility of public buildings the following should be taken into account:

The entrance: should be at street level, or if this is not possible, a ramp with a gentle slope should be installed. Alternative entry points should be avoided, being recommended only in special circumstances (for example, during building work or when the appearance of a historic building could be damaged). Floor area adjacent entries must be rigid and secure the wheelchair passage without difficulty. Changing the flooring material should not create a tripping hazard.

Information about the building lay-out: in the main lobby there should be a map showing the building lay-out: number of floors, the floor on which the person in question is, location of elevators, stairways, ramps, emergency exits etc.

Information about the lay-out of services: next to the above mentioned information there should be another map showing the services located at each floor.

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Guidance systems and personal assistance, such as floor footprints that indicate the main direction of walking for people with visual impairments.

Here are some of the **main rules concerning the access** to different areas:
- Because access paths must be accessible, all requirements relating to bumps, sizes, obstacles should be considered and complied with. Small unevenness should be avoided through ramps, while the larger ones should be climbed with lifting devices (elevators, platforms, stair elevators).
- Accessible elevators are necessary (with space for visual, acoustical and tactile information), both in normal and emergency operation. Other issues must also be considered, such as the gap between the floor and elevator, or people who suffer from claustrophobia.
- Ramps should have maximum 5% slope, only in exceptional cases the ramp can reach 8% slope. At every 10 m in length and respectively every 50 cm difference in height of a ramp, a horizontal platform (landing) of at least 1.50 m in length should be provided.
- The corridors should be wide enough to allow the parallel passage of two wheelchairs. For this situation it is recommended a minimum width of 1.8 m. Fluffy carpets with excessively deep imprints, very difficult to deal with by the wheelchair users should be avoided.
- Doors should be wide enough to allow anyone to pass through them, and their location must allow access and maneuvering of a wheelchair. As opening mechanism handle is recommended and not spherical buttons that require a twisting motion, impossible to be performed by people with reduced dexterity/power.
- Stairs should be finished with non-slippery materials. For people with visual impairments it is recommended to mark the edge of each step and flight ends with tactile materials and color finishes on floor and walls.

Handrails: must be continuous, with an extension of 30 to 60 cm at both ends, whose change of slope marks the end of the ramp or stairs. Size and shape of the bar should allow comfortable grip, and the section should be circular or oval.

Toilets: There must be enough toilets available on each floor, with additional space for wheelchairs, alarm systems and all mechanisms available both for people with different heights and with different handling capabilities. To facilitate the transition from wheelchair to toilet bowl it should be installed support bars on both sides of the toilet. The bars must be able to support a person in a wheelchair or a person with balance problems in getting up and sitting down.

Emergency evacuation: Special attention should be paid to vertical evacuation, where the elevators and stairs must be fire protected. For visual impairments, the elements of a good design with reasonable adjustments are: contrasting colors, handrails at evacuation stairs, contrasting color applied to the edges of steps, markings, different floor textures along the escape route, orientation information and a standard alarm system. For hearing impairments flashing lights or vibrating units should be used.
Signage: informative signs (logos, direction arrows etc.) should clearly describe the service they represent (new designs that create confusion and the use of letters or initials should be avoided).
For icons indicating facilities should be considered the characters proportion and height, the writing in relief and the contrast with the background on which they are applied.
Lighting: should be enough and located in places that provide guidance. Visually impaired people are constantly investigating the lower part (below 1.2 m) of the room, therefore it is recommended to provide uniform lighting according to this requirement. Front lighting and shiny surfaces that cause glare should be avoided.
Filters: should be well maintained, the air-conditioning systems should help to avoid allergens.
Walls: should be free of obstacles so that people with visual impairments use them as a guide.

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Unnecessary dangerous elements: certain decorative elements may be dangerous if they are not well designed, installed or indicated, like:
- large mirrors or glass windows that give the space a sense of continuity;
- waxed floors which are slipery;
- infra-red doors which do not function unless the person reaches a certain height;
- carpets which are not fixed to the floor;
- counters for public relations with prominent edges;
- reflecting surfaces or floors with drawn floor tiles that can give the impression of depth.

5. Accessibility in public buildings in Romania

5.1 The situation of disabled people in Romania

According to statistics provided by the ANPH [10] (National Authority for People with Disabilities) on 31.03.2012, the total number of people declared disabled in Romania is 687.596, out of which 230.906 are certified persons with severe disabilities. 97.5% of them are in the own family care, 2.5% inhabit residential institutions coordinated by the ANPH, 4% are working, 52% are located in urban centres and 54.03% of total are women [7].

In Romania the norms regulating the disabled people's rights are: HG 1175/2005 approving the National strategy for protection, integration and social inclusion of disabled persons in the period 2006-2013, the Law no.448/2006, the UN Convention on the Rights of Persons with Disabilities ratified by the Law 221/2010 and the design regulations (NP-051-2001 "Standard for the adaptation of civil buildings and urban space to the needs of persons with disabilities" and NP 023-1997 "Standard for designing homes for the elderly and disabled based on performance requirements").

5.2 Accessibility in public buildings in Romania

In 2007, ANPH has prepared a report concerning "The situation of environmental accessibility in Romania, in cities with over 50.000 inhabitants", delivering data concerning all the relevant aspects this domain, one of the charts being shown in Fig. 2 [10, 7].
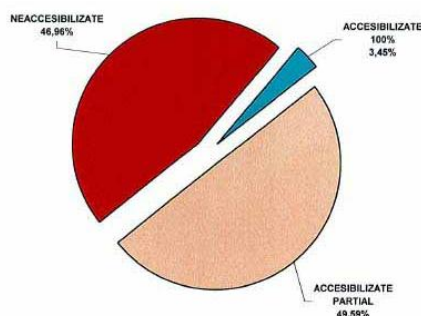

Fig.2 The accessibility of public buildings in Romania [10]

Legend:

■ (blue)	-**100% accessible**	= ramp, door, adapted toilet, handrails or elevator
■ (peach)	-**partially accessible**	= ramp, door
■ (red)	-**inaccessible**	= lack of any accessibility

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CE-PhD 2012, 4-7 November 2012,Cluj-Napoca, Romania
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5.3 Accessibility in public buildings in the city of Cluj-Napoca

In this study it was taken into account the degree of accessibility of buildings made in the late XIX century and early XX century, more precisely the period 1867-1918 known in history as "the dualistic period". The establishment of the dual regime after signing the Compromise between the Austrian monarchy and Hungarian nobility, meant both, the split of Habsburg Empire into the Austro-Hungarian Empire with two power centres (Vienna and Budapest) and the liquidation of the autonomy of Transylvania which was embedded in the Hungarian Kingdom. Thus, the city of Cluj loses its political role previously held in an autonomous Transylvania and undergoes an extensive modernization funded by the Government of Budapest. Investments in administrative, medical, cultural and educational field definitively changed the image of the city [11, 7].

Finance Administration Palace (Fig.3), in Neo-Renaissance style, was built between 1885-1887, being located on the south-eastern corner of one of the main squares in the inner city.
For people with mobility impairments the access to counters room at the ground floor is inadequate and has no indication, being made through the carriageway corridor on Dorobantilor street (Fig.4), across the courtyard, towards the ramp located on the opposite side (Fig.5).

Fig.3 Finance Department Palace

Fig.4 Access for disabled people

Fig.5 Ramp

For tax payment no counter is adapted for people with disabilities (wheelchair users, short people) (Fig.6). The lack of an elevator makes the floors out of reach by such people (Fig.7). The communication/signalling system with tactile and visual markings (in case of step edges and flight ends), with icons, symbols in Braille and keyboard phones is completely lacking, making the institution services impossible to be used by people with hearing and vision impairments as well.
The lack of a lifting platform or a stair elevator makes the Treasury out of reach for people with mobility impairments (Fig.8).

Fig.6 Counters

Fig.7 Main entrance

Fig.8 Treasury access

The University Library "Lucian Blaga" (Fig.9), in eclectic secession style with neo-baroque elements**,** was built between 1906-1909, being located on the south-western corner of Lucian Blaga square.

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CE-PhD 2012, 4-7 November 2012,Cluj-Napoca, Romania
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For people with mobility impairments, the access is provided from the Clinicilor street (Fig.10) on the carriageway entrance. This secondary entrance is discreetly signaled at the main entrance by a panel, an icon and a ring bell currently inoperable (Fig.11).

Fig.9 The University Library   Fig.10 Entrance Clinicilor street   Fig.11 Ring bell

From the courtyard of the institution, people with mobility impairments can access the ground floor through an elevator unfitted with audio-visual signals and controls (Fig.12), positioned in the middle of a spiral staircase. Tactile markings indicating the walking direction are present at the floor level (Fig.13). At the main stairs, the step edges are marked, but tactile and visual markings for the flight ends are missing (Fig.14).
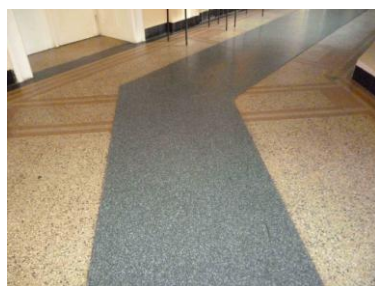

Fig.12 Elevator   Fig.13 Tactile markings on the floor   Fig.14 Main stair

Information panels are discreet, some are obstructed by various pieces of furniture (Fig.15). The height of the librarians block is not suitable for wheelchair users (Fig.16). Toilets at the ground floor are adapted for people with disabilities (Fig.17), although are not taken into account details such as the optimal height of the mirror and the contrasting colors between the floor and the walls.

Fig.15 Information panel   Fig.16 Librarians block   Fig.17 Toilet (ground floor)

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CE-PhD 2012, 4-7 November 2012,Cluj-Napoca, Romania
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6. Conclusions

At present, Romania has the mentality of "minimum necessary" or "mandatory minimum", this being the main barrier in achieving an accessible built environment, added by the lack of adequate budgets to support accessibility arrangements. Protection laws for people with disabilities are not properly observed, often being considered optional by state institutions, thus condemning citizens with disabilities to isolation and marginalization. Access to education, healthcare, employment, specialized social services, public transport, sports, cultural, leisure, living and movement conditions in public space are areas not at all or insufficiently resolved by local authorities.

The necessary measures for the accessibility in public buildings are mainly the following:
- Implementation and compliance of laws and regulations that take into account the rights of people with disabilities.
- Identification of the main issues affecting accessibility and inclusion [9]
- Establishment of consultation groups (access groups) at the beginning of each project
- Cooperation with representative organisations of and for disabled people [9]
- Bringing accessibility expertise into construction projects [9]
- Information and publicity campaigns on accessibility, to the entire civil society
- Integration of accessibility and universal design into the curricula and training for relevant professions (see Resolution ResAP (2001) 1 of the Council of Europe)
- Conducting case studies in accessibility that demonstrate what can be achieved with careful planning and capability for compromise solutions [9]

Looking at the facts, one can say that compliance of the above measures will determine the future development of the accessible built environments.

For a building to last in time it has to be adapted constantly to the needs of the moment, and this adaptation influences both architecture and structure.

It is important to connect the professionals in construction (and their practices), with social and political issues, providing the means for connectivity to be made „between the built environment, and the individual and collective human well-being" [2, 7].

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