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## Inclusive Design - Architecture for Everyone



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## Abstract

Despite a vast set of rules and regulations concerning architecture for disabled people, the built environment still lacks functionality and accessibility. Architecture is often not suitable for handicapped people, whether the impairments are permanent or temporary. Building regulations focus mainly on wheelchair users as a stereotype disabled person while disregarding other limiting factors to other fringe groups. The variety of impairments being immense and architecture needing to be useable or adaptable to the needs of every person, more suitable guidelines than strict and non-flexible building regulations are necessary. Today's state of the art in accessible design is called Inclusive Design. In contrast to other regulations for disabled people, Inclusive Design doesn't give a set of rules, but principles for orientation. The thesis will explain that ID is not a new idea, but is a logical consequence deriving from the history of design for disabled people. Furthermore the application of ID in different European countries will be shown.

This paper will counteract the prejudice that non-functional architecture is often built due to financial reasons (e.g. there is no budget for additional technical gear) or because the architect didn't focus enough accessibility matters. It demonstrates that it is possible to create an accessible built environment at no extra cost through the application of the ID principles. Furthermore it breaks down the process of building design and examines the limits and power of all stakeholders to a project. It emphasizes that every person, not exclusively the architect makes a big difference to a building project.

To explain how ID can be implemented in reality, several building projects are discussed at different scales and with focus of a different group of participants: urban planners, developers, architects and designer. A fictive project was designed on the base of the ID principles to demonstrate in detail the implementation of ID principles in a great context.

## Estratto (Abstract translation in Italian)

Per quanto esista un vasto numero di norme e regolamenti relativi all'architettura per persone disabili, lo spazio edificato manca ancora di funzionalità e accessibilità. Spesso l'architettura non è adatta a persone con disabilità, siano queste temporanee o permanenti. Le norme in materia di costruzione si concentrano principalmente su persone in sedia a rotelle come stereotipo del disabile, trascurando handicap di altri gruppi marginali. Dal momento che la gamma delle disabilità è molto ampia e l'architettura necessita di essere accessibile o adattabile ai bisogni di ogni persona, si rendono necessarie linee guida più adeguate piuttosto che regolamenti edilizi troppo rigidi. A oggi lo stato dell'arte in materia di design accessibile viene chiamato Inclusive Design. A differenza di altre normative per persone disabili, l'Inclusive Design non fornisce un insieme di regole, bensì dei principi orientativi. Questa tesi dimostrerà come l'ID non sia un'idea originale ma la logica conseguenza della storia del design per persone disabili. Verrà inoltre trattata l'applicazione dell'ID in diversi paesi europei.

Questo lavoro vuole smentire il pregiudizio per cui dietro un'architettura non funzionale ci siano spesso ragioni di tipo economico (ad esempio, carenza di fondi per attrezzatura tecnica supplementare) o una carente attenzione da parte dell'architetto al tema dell'accessibilità.

Si dimostrerà come sia possibile creare uno spazio edificato accessibile senza costi aggiuntivi mediante l'applicazione dei principi dell'ID. Inoltre si analizzerà in dettaglio il processo del design costruttivo esaminando i limiti e i poteri di coloro che partecipano al progetto. Si evidenzierà quanto il contributo di ogni singolo individuo, e non esclusivamente dell'architetto, possa fare la differenza in un progetto edilizio.

Per dimostrare come l'ID possa trovare applicazione pratica, discuteremo alcuni progetti edilizi a differenti livelli focalizzandoci sui diversi gruppi di partecipanti: pianificatori urbani, sviluppatori, architetti e designer. È stato studiato un progetto fittizio basato sui principi dell'ID per dimostrarne nei dettagli l'applicazione in un ampio contesto.

## Introduction

In most places around the world today, society claims to be very open, liberal, giving everybody equal opportunities. This can be found in equal opportunity schemes or funds for the financially less well off. Effort is made in including every member in society to fully participate. Nevertheless, the non-average like children, the elderly or people with disabilities still find it very hard to fully take part. This is due to a series of very different reasons. Firstly the needs of the various minorities are very different and sometimes integration simply cannot be achieved. Nevertheless it is very often to see, that there is a reluctance of non-handicapped members of society to really try their very best to include handicapped fellow citizen. Additionally barriers in everyday life, caused by the physical surrounding are numerous and as multifaceted as are the impairments people carry with themselves. Determination of participation through the human environment is found on every level: industrial products might not be easy to handle for everybody, a train might not be accessible for every customer or a city quarter might not give the opportunity for great self-development to every inhabitant. Design, technology and materials determine everybody's life on a daily basis, often without the average person noticing that the exact item he/she is using is not suitable for others. The same principle applies to the built environment. It includes all the spaces around us that shall cater for literally everybody without restrictions. Still, many places fail to be accessible for everybody. Again, the reasons are numerous and of different scales, but surely everyone of us has faced situations, where spaces were non-accessible. Typical situations would be entrances that can only be reached via stairs, so wheelchair users cannot enter or signage that is too small, so people with limited vision cannot see important signs. Intelligent planning and design are necessary to create spaces that can achieve accessibility for everybody or at least a highest possible number of users.

This thesis will examine closer, how the built environment can be made more accessible through thought-through planning, development and design. While



nobody argues the need of accessibility for everybody, the opinions and approaches of how this could be achieved vary greatly. Several schemes, theories and studies deal with the features accessible architecture needs to have. One approach is called Inclusive Design. It is a state-of-the-arts set of principles to guide various stake-holders to a design project. The basic is that Inclusive Design, furthermore referred to as ID, does not give a strict set of regulations, but a basic framework for planners, developers, architects, designers and other participants to react and create. ID is not exclusively made for a certain marginal group, but addresses people that face exclusion for all types of reasons. The paper will give an overview, what ID means and how it is applied. Discussing several aspects of ID will give the reader an understanding of the simplicity and the importance of ID.

To introduce the matter, the first chapter will give a brief overview over the handicaps, non-average people are facing. It is important to understand the multiplicity of issues that need to be addressed, when developing the accessible space. It also gives a first idea, why a set of principle would be more suitable for a framework to barrier free design than fixed regulations as, for example, offered by governments.

Once the reader is aware of the complexity of problems regarding accessible design, the principles of ID will be explained, highlighting the shift in thinking that is necessary to fully apply the principles and consequently design the inclusive environment, or, rather the shift in thinking that comes automatically when applying ID to any design project.

As ID represents the values of our modern society, it is of significance to understand the historical development that lead to the theory. ID is not a single persons achievement, but draws consequences from earlier failures and achievements. The history of Design for the Disabled raises awareness of how much effort from various institutions, governments, thinkers, planners, .... was necessary to arrive at the state of mind that is necessary to define and apply ID. The chapter also gives a first idea about how ID can be achieved if attitudinal prejudices more than anything else are antiquated.

Once it is understood that ID is possible everywhere, mostly without greater financial investments, solutions in several countries throughout the European Union will be examined. Differences in the approach to ID will occur due to a different climate, different housing schemes and national history. A closer look will be taken at the governments effort to support barrier free architecture as well as traditional building methods and standards. Despite the differences that can be found between the countries, this chapter will demonstrate that the principles of ID can be applied regardless, du to its flexible nature.

Looking closer into existing projects the thesis will demonstrate that there is a great number of stake holders to any project that is responsible for the design success or failure. It is often assumed that the architect would be the single person to make decisions on ID. Being true to a certain extent, a fully accessible environment can only be achieved if everybody that is involved in a project makes decisions according to the principles of ID. ID depends on a multidisciplinary approach. The thesis will explain the extent in which participants, e.g. planner, developer, can contribute to the success of a built project. It will deal with the attitudinal restrictions of various players and give suggestions of how to discover and overcome those. Several case studies will give proof of the benefit of ID and show once more, how it can be applied to projects of different scales. Due to being such a new approach, post-occupancy studies are still missing to great extent. This might be due to the still-in-construction state of the project or to the fact, that no common method to define evaluate a project are defined yet. Possibilities and restrictions to post-occupancy evaluation are given in this last base chapter.

The third part of the thesis, shows how a built project could look like. As guidance to design a hypothetical project that could be built in reality, the task for the Schindler Award 2010 was taken. It is situated on the Western outskirts of Berlin and asks for the refurbishment of a train/tube station and an open air theatre, a new built sports hotel and the design of the public spaces in between. The project designed according to the rules of the competition will demonstrate, how it is possible to apply the principles of ID and create an accessible environment by the pure sensible use of architecture. It will demonstrate, how the principles of ID guide a project to access success.

## Chapter 1: What is “Inclusive Design” and what is it for?

Looking into the future, our society faces many soon to happen drastic changes. Most of them will occur in the context of sustainability. Sustainability has many features. Apart from nature, which is very often put in one line with with the word sustainability, the expression actually addresses the successful living on earth in every sense; economically, socially, environmentally etc.. The aspects are manifold. Designing the built environment in a sustainable way, means to built not only environmentally friendly, but also to consider every person living within it and creating an environment, that supports the needs of every individual within it. With our society getting gradually older, the needs of the inhabitants / clients change. Architecture needs to support a growing community of people with mobility impairments and the need of a quiet, friendly environment. At the same time our society realises that disabled people are a great contribution to it, allowing disabled people to participate more than ever in every day life. Also their needs as a group are very diverse and planning to give access for all is a process that needs a good understanding of the needs of every individual first. The wish to design the perfect surrounding for everybody becomes even more complex when further fringe groups are taken into account. Designing for children, women, members of certain religion, ... can often be challenging. To understand the difficulties stake holders of an architectural project are facing, we have a look at different groups of people. The range of fringe groups are as many as there are people on earth. Everybody feels excluded through his/her environment at some point.



Image 1: Woman struggling to open the front door

The barrier to face might be very small and only of a short period. Surely everybody once arrived at his home at one point with heavy bags and faced problems to open the front door. It is those everyday barriers that Inclusive Design tries to avoid. Handicaps of people , whether temporary or permanent, are manifold and barriers to a smooth every day routine uncountable. To keep focused 3 major groups will be examined closer: Elderly people, disabled persons and children.

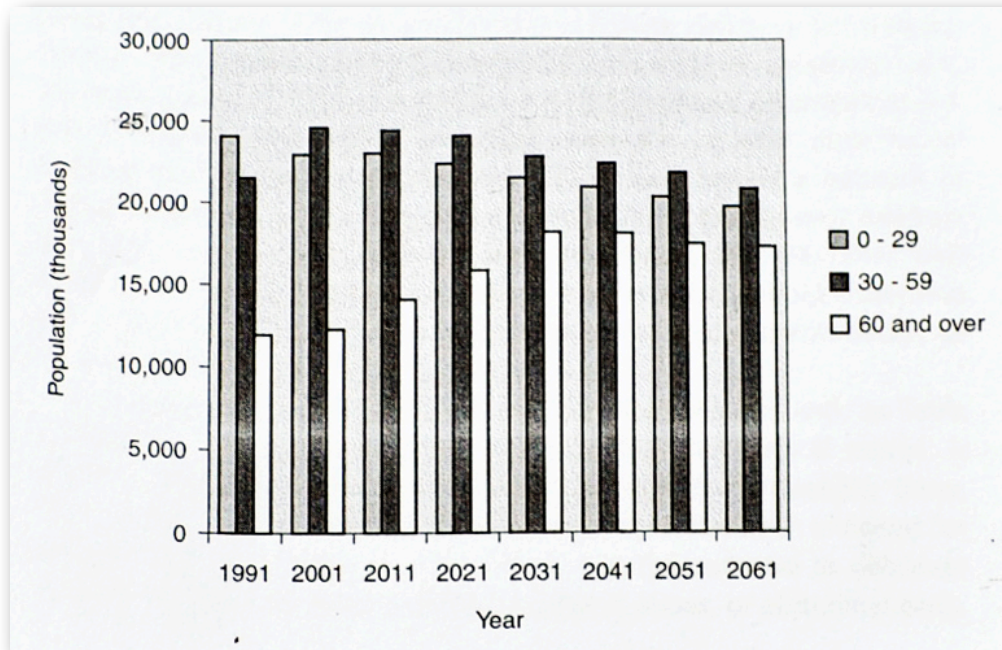


Table 1: demographic development in Germany (Eurostat 2002)

### The elderly

With the number of elderly people steadily increasing in the union, future Europe has the responsibility to provide adequate space and environments to support the large numbers of affected inhabitants. Equal opportunities schemes for disabled people become more and more common and need an inclusive environment to fully function and not only be initiative of a single person. It needs an environment that is accessible through all its design criteria and aspects. There is an understanding of the need for Universal Design to enable people with disabilities to reach full democratic and economic advantages.



Image 2: Elderly person struggling to use sanitary appliances.

### The Disabled

Even though a lot needs to be done, society in Western Europe today is more open for the inclusion of disabled people than ever. People realise, that the group of disabled people is not that small and excluding them means excluding a great number of potentially productive people in a society.



Image 3: Person in a wheelchair in non-accessible kitchen

Consequentially Europe now sees the adoption of an increasing number of national disability action plans and intends to give disadvantaged people a useable environment, acknowledging that concrete actions are needed. Later on, during the overview of the history of the design for the disabled, concrete programs and actions will be shown. This chapter nevertheless deals with the types of impairments only. It gives an overview over the manifold types of impairments and their appearances. As the impairments appear in uncountable ways, also this chapter gives an overview only.

Different types of impairments are:

groups with various limitations to their mobility, information or communication skills within their environment can be defined. such impairments can be:

- impairments to mobility (e.g. people that cannot walk easily or unusually small people, children or pregnant women)
- impairments to perception (e.g. blind or deaf people)
- cognitive impairments (e.g. people with learning difficulties, mental illness, impaired speech or dementia)

Each of the different groups will have different need towards the built environment. The various disabilities are not limited to the most obvious ones. In regards to impairments to mobility, a wheelchair user is generally regarded as the central example, but disabilities can be very different for all three of the categories. To understand the full scope of different impairments, the following list gives a number of impairments and how it affects the body of the affected person according to Skiba, Züger, 2009

### **Impairments to mobility**

Impairments to mobility might be temporary (e.g. a broken leg or pregnancy) or might be permanent. Barriers to mobility are often the easiest to avoid. They might be changes in ground level or the lack of space for movement and/or turning or the miss-placement of a door, so opening might be difficult. Most of this considerations are based on the needs of a wheelchair driver. While on one side being one of the most drastic impairment to mobility, this is not the only one and other disabled people might face other difficulties. Barriers referring to special fringe groups (e. g. the elderly, children, illiterate). The following examples show permanent or at least long-term disabilities to mobility.

#### **Cerebral Damage:**

Cerebral Damage is a brain damage, that can also disturb locomotion without causing mental impairment, It is usually caused before or during birth or through a stroke. Strokes often paralyse one or both sides of the body and may cause spastic paralysis with disrupted co-ordination, spastic paralysis of one or more limbs.

#### **Spinal Damage;**

This damage might cause paralysis of the lower and/or upper extremities. Paraplegia, cause by damage to nerve fibres along the spine may create motor or



sensory restrictions or impair vegetative function. Spinal damage appears in various very different degrees, alone or as multiple disabilities.

Vegetative nerve system:

The vegetative nervous system controls the vital functions, meaning that damage to the spine can reduce reflex activity and individual organ systems' efficiency, impairing bladder and digestive tract function, heart and blood circulatory function, and body temperature regulation. Insufficient heart and circulatory function, for instance, causes shortness of breath and a tendency to tire quickly, thus restricting the patient's activity radius.

Small or large size:

An unusual body size might be caused by hereditary factors, foetal damage or pathological growth disorders. Factors that apply to small people also apply to children. In this case, the major limitation is the inability to reach high objects.

### **Impairments to perception**

Those sensory impairments include sight, hearing, smelling and tasting. Barriers to orientation are often the most difficult to overcome for elderly persons and children. When vision becomes less strong, the vast amount of signage makes it impossible to find the necessary description for ways, entrances etc. difficult. Furthermore space layout is hardly ever made for children. The little ones, that cannot read hardly ever find organised signs for orientation that are suitable for their head height as well as for their educational status. Also Tourists are facing problems in orientation very often, mainly due to missing signage or, if abroad due to a lack of pictograms. This is also a classic example for the conflict of ID interests: signage should be clear and as little as possible to avoid confusion, but at the same time give all the necessary information to users that are completely new to a space and might not even speak the local language.

Visual impairment:

This damage describes various degrees of restricted vision, ranging from mild visual impairment to complete blindness. It includes colour blindness and night blindness.

Hearing impairment:

This might range from light to profound deafness with impaired hearing at birth also disrupting speech centre development and possibly limitation to the sense of

balance and direction. Deaf people have difficulties to locate signals, meaning that simultaneous noise overtax their perception.

Haptic impairment:

Haptic perception refers to touch in the broad sense and the processing of touch-related stimuli in the brain. Haptic perceptions and similar impairments, can be categorised in two groups: Exteroception, which describes tactile perception such as touch, pressure, vibration, temperature or pain sensation. Proprioception, which refers to the introverted perception of one's own body, mainly in the sense of position, force and movement and is important for controlled and co-ordinated movements.

Other senses:

Sometimes, olfactory senses (smelling) or gustatory senses (tasting) can be considered when designing a building. A person with limited sense of smell will become aware of gas or fire too late by failing to smell the gas or the smoke.

## **Cognitive Impairments**

Cognitive faculties include thought processes in the broad sense: learning and remembering, recognition and visualisation, formulating conclusions and judgements as well as wishes and plans. Several impairments can be caused from cognitive impairments: memory disfunction, thought disfunction, autism, impaired social abilities or abnormal behaviour. The impairments appear mostly in combination with others. Some, like dementia, are combined with getting older.

## The Children

Children are usually not regarded as a fringe group and are therefore the probably most forgotten one. Institutions for children are well equipped and have good service, but as soon as children leave the specially designed environment, they find themselves in a very confusing environment, overloaded with visual impressions.

Children grow up in a world designed for grown ups. Shop windows are too high to see everything, toilets are too high to use comfortably, light switches cannot be reached by the youngest. The matter of height and scale is particularly important, when designing the home of a child. Everyday items should be in reach, giving a child confidence and teaching it independence: instead of asking the parents to

bring every needed item and also to put it away after use, the child can do it itself, thus learning the first aspects of responsibility.

### Barriers to operating systems

Not a type of impairment in a sense of barriers to operating systems In comparison to the former analysis of barriers, barriers to operating systems are to be avoided by manufactures and architects and are rather out of responsibility to the developer. It also needs to be distinguished, whether the building structure is to be newly built or the project is the refurbishment of an existing, maybe even listed structure.

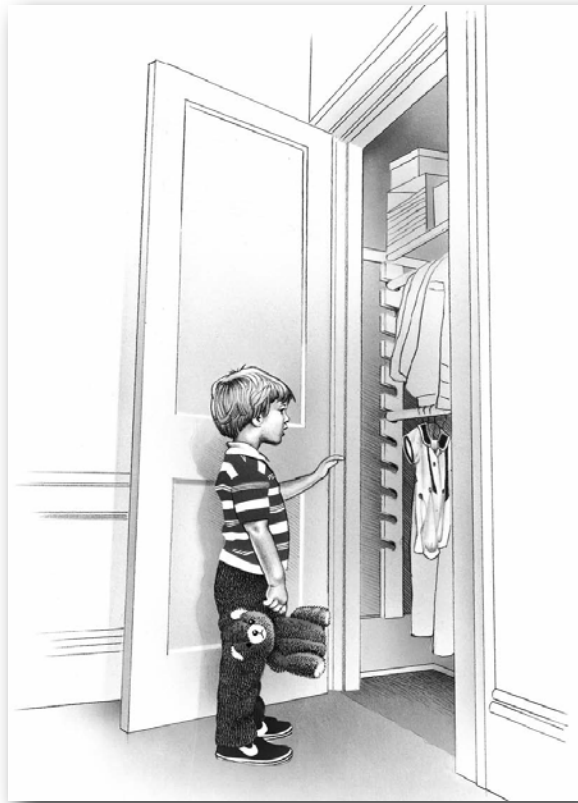
### Conclusion:

Architect I.M. Pei notes the need to go beyond mere access: "Spatial relationships need to be experienced. Persons with disabilities must be able to enjoy the psychological aspects of a structure, not only the individual points or planes within it" (Goldman, 1983) and designers need to feel the requirements a space has as pure simple building regulations are not sufficient. As with design objectives such as energy efficiency and fire safety, there is no accessibility solution that will meet every design challenge. However, if designers are sensitive to the full range of users for products and buildings, there are numerous decisions which can be made at the conceptual design stage of a given project that will enhance the functional aspects of the design for both disabled and non-disabled people.

## Definition and Explanation of ID

*“The central principle is that a persons are not inherently disabled, but disability is generated through their surroundings” (Skiba, Züger, 2009, p.9)*

The quote by Skiba und Züger above describes the basic idea behind the state-of-art of design for the disabled. It is not the person that is handicapped, but the



environment that does not suit part of its inhabitants. Consequentially a rethinking

Image 4: Child struggling to reach items in its wardrobe

concerning the design of the built environment is needed. Former models of behavior include pity or ignorance towards disabled people, the elderly or also children and those that are temporarily handicapped. Unfortunately people today sometimes still show a lack in respecting people with handicaps as full productive

members of the society. Players in the design process showed and often still show a great reluctance to react to the different needs of the non-average person to support their integration.

With the introduction of Inclusive Design (ID) or Universal Design, both expressions will be used as synonyms throughout the work, the view onto disabled or environmentally disadvantaged changed. Inclusive and Universal Design refer to the same theoretical approach and were developed at about the same time. The expression Inclusive Design is mainly used in Europe, while Universal Design is the name used in America. As most of the thesis deals with happenings in Europe, the expression Inclusive Design (formerly referred to as ID) will be used dominantly throughout the thesis.

ID means a shift from a medically driven model to a socially driven model. Mike Oliver was one of the first people to look at disability from the other side. To him it is not the disability itself that determines people, but the society and surrounding. In 1990 he comprises the following table:

medical (out-dated) model	Mike Oliver
Can you tell me what is wrong with you?	Can you tell me, what is wrong with society?
What complaint causes your difficulty?	What defects in the design of everyday equipment like jars, bottles and tins causes you difficulty in holding, gripping or turning them?
Are your difficulties in understanding people mainly due to a hearing problem?	Are your difficulties in understanding people mainly due to their inability to communicate with you?
Do you have a scar, blemish oder deformity which limits your daily activity?	Do other people’s reactions to any scar, blemish or deformity you have may limit your activities?
Does your health problem or disability prevent you from going out as often or as far as you would like?	What is it about the local environment that makes it difficult for you to get about in your neighborhood?
Does your health problem or disability make it difficult for you to travel by bus?	Are there any transport or financial problems which prevent you from going out as often or as far as you would like?
Does your present accommodation have any adaptions because of your health problem or disability?	Did the poor design of your house mean that you had to have it adapted to suit your needs?

Table 2: Comparisson medcal and social model according to Mike Oliver

Later on, in 1996, the revolutionary social model by Mike Olivers was developed further by Barnes, who argues that there must be a balance regarding the disabled people. The social model is important to understand the responsibility of every individual in creating a comfortable environment for everybody. But, so states Barnes, there is a medical component and a limit to ID, so a balance bio-social model shall be preferred. He composed the following table:

<b>medical</b>	<b>social</b>	<b>bio-social</b>
personal tragedy theory	social oppression theory	bio-social theory
personal problem	social problem	personal/social problems
individual treatment	social action	individual/social action
medicalisation	self-help	medical/self-help
professional dominance	individual/collective responsibility	collective responsibilities
expertise	experience	expert/lay experiences
individual identity	collective identity	individual/collective identity
prejudice	discrimination	prejudice/discrimination
care	rights	care combined with rights
control	choice	control combined with choice
policy	politics	political and policy change
individual adjustment	social change	individual adjustment and social change

Table 3: Comparisson medical, social and bio-social model

This definitely revolutionary shift might leave the question: “How will the newly designed environment look like?” or “Can the new ideas be transformed in built space or are the aspirations of Inclusive Designers to high?” and “Who is responsible for the successful design of the built environment?”. The answer might be surprising: The building process is not to change, it is more that additional

aspects and included features make it more readable to the various users. The built environment in its scale and appearance will hardly change. Transformation of the functional space into actual living space is often simple and small as examples in the following chapters will show.

Many theories were developed the last three decades trying to make this world a little more usable for the non-average. Key words for those approaches would be Design for All (DfA), Design for Need (DfN), Access for All or barrier-free design. Even though the aim of all those theories are the same, none of the mentioned schemes follows the social model as strictly as ID, aiming to change attitude first and achieving better design results through a mixture of increased awareness and a set of standard guidelines.

*“Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design.” – Ron Mace*

The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design is the idea to create an environment that benefits people of all ages and abilities. One of the first institutions that preoccupied themselves with Universal Design was the North Carolina State University.

The Center of Universal Design of the NC State University “is a national research, information, and technical assistance centre that evaluates, develops, and promotes accessible and universal design in housing, buildings, outdoor and urban environments and related products. The Center's work manifests the belief that all new environments and products, to the greatest extent possible, should be usable by everyone regardless of their age, ability, or circumstance. Part of the College of Design at North Carolina State University (NCSU), Raleigh, NC, the Center promotes the concept of universal design in all design, construction, and manufacturing disciplines through research, design assistance, and training.” (definition as per home page CoU)

The Center conducts original research to learn what design solutions are appropriate for a great diversity of users and what tools are most useful according to the principles of universal design. The Center collaborates with builders and manufacturers on the development of new design solutions. It also develops publications and instructional materials, and provides information, technical assistance to individuals with disabilities, families, and organisations nation-wide and internationally. Members developed an easy to read and understand leaflet



about the main principles of ID, used as a simple handout, capturing the most important aspects of designing for everybody.

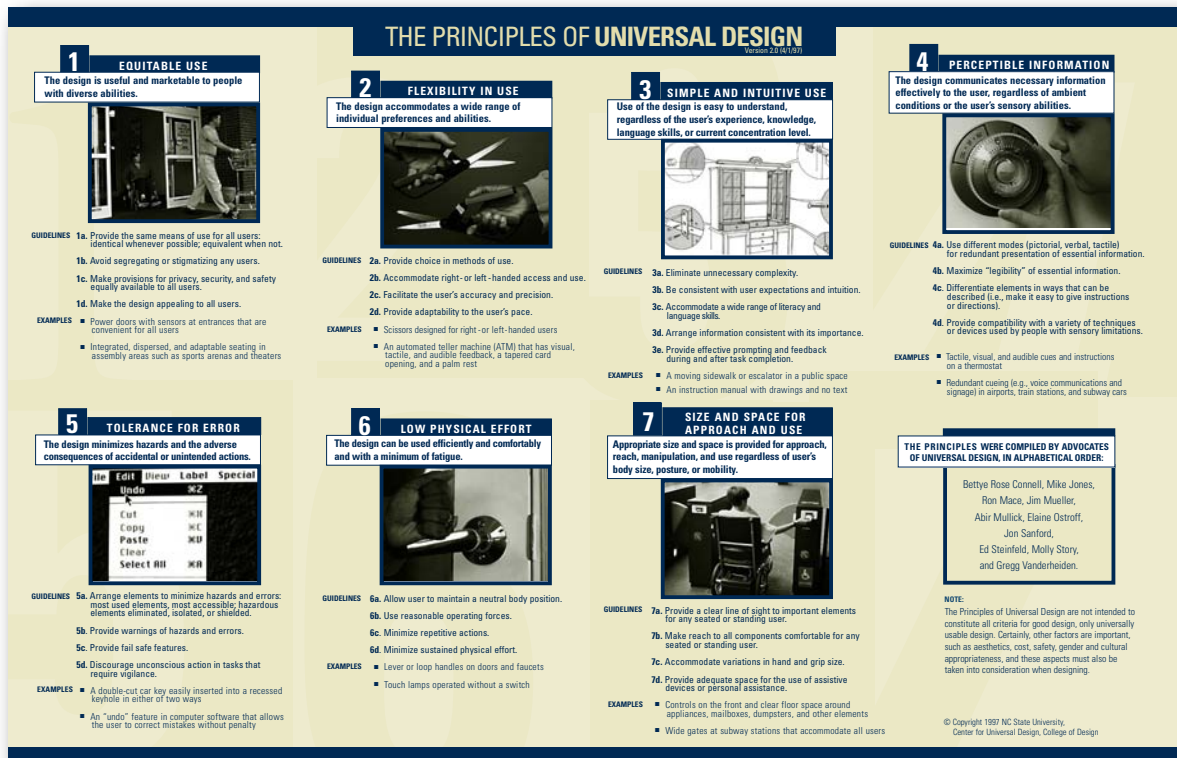


Image 5: Poster from the Center of Universal Design

One of the first European organisations that dealt with ID was CABE, the Commission for Architecture and the Built Environment in England. CABE is an independent organisation that provides design advice to the UK government concerning building proposals for buildings and spaces. CABE exists since 1999 and has since then reviewed more than 3000 proposals for significant developments.

Furthermore CABE has the task to lead and create public and professional debate about how to design great spaces for people. Their work, even though they are a national body, is for the local public of each project. The aim is to inspire, initiate good design and create a healing, not stressful environment. CABE has a large network of local design advisers, all leaders in their professions – architects, planners, engineers, landscape architects, urban designers and surveyors.

According to CABE, the main idea of ID is not simply the accessibility of spaces, but the access with dignity. The main question is not “Will everybody get into this space?”, but “Will everybody be able to get into this space and use it with ease?”

Respect is a major aspect of ID. No separation shall be made and no extra effort shall have to be made by a selection of users of a space compared to others. How people are approached, guided, considered and welcomed, is an important aspect. The pure provision of technical helping gadgets is not sufficient. Services and functions need to absolutely suit the needs of the clients, all clients. Places need to transmit a sense of belonging, which the designer has to have in mind when creating the space.

As a guideline, CAGE defined **five major principles for successful ID:**

1. work with others to increase diversity in the built environment professions
2. promote inclusive and equitable design through our design review panels, enabling schemes and awards, publications and promotion of best practice
3. pursue with increased rigour accessible and inclusive design and the involvement of disabled people in the development of major schemes that come to CAGE
4. research the links between inclusive design, equality and sustainability
5. lead by example by building a diverse and representative workforce and family

Looking at the defined points make it clear quickly that dealing with ID does not mean dealing with modern technical gadgets but to understand the holistic approach of how ID works and that ID is not to be compared to a set of building regulations or a manual for building design. More than any of this, ID is trying to initiate a change in attitude and a more open and all-embracing thinking.

### **The management and use of a place**

As stated above ID is not about strict building regulations. It deals with all matters of well-being and sustainable design of spaces. Inclusion and equality are about whether we find places friendly and welcoming and whether they can be accessed and used by the visitor.

ID is a good basis for functional design for all types of fringe groups like women and older people, lesbians and gay men, people from minority religions and cultures, working class and disabled people, but it is not the only feature that restricts the function and appearance of a place. Other factors include the design of the space, the attitude of staff, the furnishings, facilities, the type of events held in the place or the programming. Quite simply, "are there other people like me here?" Getting every aspect right will enhance the sense of safety, well-being and belonging. For the scope of the thesis, social aspects of the design of a space will be excluded. Whether the designed or mentioned spaces will encourage social networks and contacts is not part of the thesis even though in reality it shall not be underestimated or forgotten.

Parallel to the constitution of the five principles of ID through CIBE other major organisations got interested in the new matter, defining new standards of Design for the Disabled. Building upon the Tomar Resolution adopted in 2001 (a resolution made by the ministers of the European Union):

- ID is a strategy which aims to make the design and composition of different environments, products communication, information technology and services accessible and understandable to, as well as usable by, everyone, to the greatest extent in the most independent and natural manner possible, preferably without the need for adaptation or specialised solutions.
- The aim of the ID concept is to simplify life for everyone by making the built environment, communication, products and services equally accessible, usable and understandable.
- The ID concept promotes a shift to more emphasis on user-centred design by following a holistic approach and aiming to accommodate the needs of people with disabilities, including the changes that people experience in the course of life.
- ID is a concept that extends beyond the issues of mere accessibility of buildings for people with disabilities and should become an integrated part of policies and planning in all aspects of society.

The challenge is to develop easy-to-use solutions with built-in adaptability and compatibility, suitable for as many people as possible, including people with disabilities. For people with special needs, assistive technology and personal services will still be part of the total solution. There is no benefit in disregarding the existing technical appliances that could help the individual in need.

Examples of a combination of Universal Design, beneficial for everybody and assistive technology interaction would be:

- A built environment designed for use by all types and sizes of wheelchairs, walking frames, etc.. This is an efficient environment for users of this kind of technical assistance, and is at the same time easier to use for parents with prams or travellers with suitcases on wheels.
- In a cinema many people with hearing aids can hear the sound track if the cinema is equipped with a compatible induction loop system.
- A website complying with web accessibility requirements is more useful for blind and dyslexic persons with screen readers reading the page aloud, and screen readers are increasingly becoming a standard feature of common software.
- Powered height-adjustable tables, when properly designed, can be seen as compatible with wheelchairs, as they allow everyone, including wheelchair users, to find a comfortable working position.

As by today ID is a well accepted approach expanding on formerly used schemes. **7 principles of Inclusive Design** have been constituted:

1. equitable use: useful and marketable to people with diverse abilities;
2. flexibility in use: accommodates a wide range of individual preferences and abilities;
3. simple and intuitive use: easy to understand regardless of the user's experience, knowledge, language skills, or current concentration level;
4. perceptible information: communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities;
5. tolerance for error: minimises hazards and adverse consequences of accidental or unintended actions;
6. low physical effort: can be used effectively and comfortably and with a minimum of fatigue;
7. size and space: appropriate size and space is provided for approach, reach, manipulation and use, regardless of the user's body size, posture or mobility.

A very simple example of the adaption of an everyday product to ID principles is a telephone booth, which is accessible to wheelchair users as well as people who are able to stand as you can find them sometimes in the Netherlands and Scandinavia.

Universal design asks for designing the fully accessible environment. The aim shall not be to design the weakest element as strong as possible. In the opposite, every elements shall be designed and used to its best without focusing on one single item too much. For example an elevator shall have clear signage as well as audio signals. At the same time it must be usable for children as well as people with haptic impairments or somebody carrying heavy shopping bags. The signage must be on one panel, easy to read and the size of the elevator shall be appropriate for it's use. It is not any better design, when money was spent placing a very large elevator, that causes problems of usage for many people in other aspects than size.

Inclusive Design is aiming for a well balanced design in every aspect of the built or produced environment.

## Chapter 2: History of Design for the Disabled

To understand that the concept of Inclusive Design is not necessarily attended by a huge financial or organisational effort, but is a change of attitude, it is important to look a little bit at the history of organisations, critics, philosophers, social workers, etc. ... dealing with (aspects of) Universal Design. The listing of participants shows already, that this chapter does not mainly deal with building regulations or legal frameworks, nevertheless they also play a part on the way to a fully universally thinking society.

Finally this chapter shows how the shift of paradigm from unaware (look away) to universally inclusive happened. Unfortunately human history is full of examples demonstrating how disabled people or simply different people were locked away or even punished for how they were. The privately organised lock away system was dominant for centuries taking any chance of the disabled individual to develop himself or experience freedom of choice and life. Later on organised lock away systems like the typical and long used asylum seemed to have improved the possibility of a disabled person. In fact rather the opposite was the case. Typical asylums would not have the necessary infrastructure to take care of the amount of residents. At the same time people would still not have the opportunity to participate in society and develop themselves.

A generation of critics and scientists have been agitated by the definitions of "inclusion" and "exclusion" by Claude Lévi-Strauss in *Tristes Tropiques* in 1955. 'Primitive' societies, he argues, deal with strangers and deviants by swallowing them up, by making them their own and by gaining strength from them. They are anthropophagic, whereas modern societies are anthropoemic; they vomit out the deviant, keeping them outside of society or enclosing them in special institutions within their perimeters (<http://209.85.129.104/search?q=cache:wM6... FROM: http://uk.answers.yahoo.com/question/index?qid=20070215114837AAAfqAF> ) Not encouraging a philosophical discussion about the essence of humanity, this example shows, what weight the matter had in the 1950s. Radical and highly controversial statements were debated and compared to each other. This happens at the same time as the European Convention for the Protection of Human Rights and Fundamental Freedoms, that initiated a great movement that is still going on until today. The convention is one event to help to get disability out of its "pity-period", a period where disabled people were regarded as carrying a personal

tragedy with them rather than integrating them. Equal opportunity schemes were non-existent and help was very limited. Physical aid was given in hospital and care centres, but psychological help or support for personal development was hardly existent. Some were fortunate enough to have a caring family, others depended fully on insufficient state schemes.

Architecturally the modernist approach of the 50s or 60s does not live up to the needs of fringe group members. The stereotype, the norm is the item of interest. Mass production and mechanisation require a measure applying to everyone. The extreme is ignored, the non-normal does not exist in the designer's thinking.

It is only in the 1970s that organisations fighting for equal rights for everybody gain a more powerful voice. "Design for Need" was the new keyword. A major change in thinking, usually called the hippy movement suddenly brought new light into the discussion around disability: disabled people shall be equal. But the statements go even further: scientists for sociology argue, that the existing approach called "medical model" to classify people, is discriminating and that society determines people by classifying them into healthy/normal and ill/disabled.

In 1976 the social definition of disability in the UK was done through the Union of Physically Impaired Against Segregation and results in following definition: "disability is the disadvantage or restriction of activity caused by a contemporary social organisation which takes no or little account of people who have physical impairments and thus excludes them from participation in the mainstream of social activities; physical disability is therefore a form of social oppression.

In 1980 the World Health Organisation (WHO) classifies disabled people as victims of disease or misfortune in Impairment, Disabilities and Handicap. It is a blame-the-victim-approach in which the disabled person shall adapt to the environment, not vice versa. The medical issue is the focus of the concern and critical care is seen as key responsibility.

At that time disability is usually regarded as a medical issue, not a social one. Impairments are created by lacks of body function, not the miss-design of the (built) environment or attitudinal barriers through society.

Globally new organisations formed themselves, dedicated to bring justice to the matter. The United Nations declared the International Year of People with Disabilities in 1981, followed by the United Nations Decade of People with Disabilities from 1982 until 1992. This act by the United Nations was an important symbolic gesture to increase the awareness of "normal" people towards disabled fellow men.

Italy fixes standards for disabled people in 1889 through its law L13/89.

The global change had a major high in the USA when the Americans with Disabilities Act (ADA) was put to live in 1990. Its aim with its set of regulations was to ban discrimination against people with disabilities throughout all aspects of society. The ADA has been a worldwide inspiration on equal rights for people with disabilities after.

But not only state laws and regulations paved the way to an inclusive society. Governments and political bodies all around the world started contributing to improve the various aspects of an excluded persons live. The European Union for example was funding the Technology Initiative for Disabled and Elderly People (TIDE) from 1991-1994. Even though the initiative does not exist in the same form like it did in the 1990s, it started a very important chain of thought: the Design for All. Design for All means the design and function of everyday products need to be useable for everybody, also the disabled, the elderly, etc. ... it is one of the first times that the idea of adapting the environment is applied to small scale, mainly technical gadgets. The EQUAL program starts in the UK, accompanied by 2 biennial events: INCLUDE and CUWAAT encouraging a new generation of research.

In 1992 Council of Europe, one of the oldest international organisations working towards European integration, asks in its Recommendation No. R (92) 6 for a coherent policy for people with disabilities, influencing disability policies at national and international level. This recommendation was followed shortly after by the Standard Rules on the Equalisation of Opportunities for Persons with Disabilities. "Equalisation of opportunities" is defined as "the process through which the various systems of society and the environment, such as services, activities, information and documentation are made available to all, particularly to persons with disabilities" through the CoE. The rules describe preconditions, target areas and implementation measures for equal participation, with 22 rules setting out initiatives ranging from awareness raising and accessibility to information and research.

In 1995 The principles of Universal Design as discussed above were formulated at the University of North Carolina Center for Universal Design.

Only one year after the first version of the European Concept for Accessibility (ECA) was constituted. It states that "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 limitations ..... in an ensured context of high human health, safety, comfort and environmental protection. Accessibility - for all - is an essential attribute of a 'person-centred', sustainable built environment" (European Commission - Employment and Social Affairs DG).

In 1997 the Treaty of Amsterdam of the European Union sealed several new regulations concerning the European Union. Aspects of the new treaty were the legal integration of the Schengen Agreement and various aspects of European integration. Article 6 and 13 of the treaty deal with non-discrimination and human rights / integration.

- \* Article 6 (ex Article F) of the EU Treaty has been amended so as to reaffirm the principle of respect for human rights and fundamental freedoms;

- \* a procedure is laid down for dealing with cases where a Member State has committed a breach of the principles on which the Union is based;

- \* more effective action is to be taken to combat not only discrimination based on nationality but also discrimination based on sex, racial or ethnic origin, religion or belief, disability, age or sexual orientation;

- \* new provisions on equal treatment for men and women are inserted in the Treaty establishing the European Community;

- \* individuals are afforded greater protection with regard to the processing and free movement of personal data;

- \* the Final Act was accompanied by declarations on the abolition of the death penalty, respect for the status of churches and philosophical or non-confessional organisations, and on the needs of persons with a disability

([http://europa.eu/legislation\\_summaries/institutional\\_affairs/treaties/amsterdam\\_treaty/a10000\\_en.htm](http://europa.eu/legislation_summaries/institutional_affairs/treaties/amsterdam_treaty/a10000_en.htm))

The treaty is a major step in the history of the European Union as it guarantees equality to all the members of the EU regardless of gender, nationality or capabilities.

Slowly the consideration of disabled people reaches niches and various markets like the internet. From 1997 until 1999 the Web Accessibility Initiative (WAI) by the W3C organisation, a Consortium in which an international community of Member organisations, full-time staff and public work together to constitute Web standards, developed the first accessibility guidelines for the Internet

Further improvements include (listing according to the CoE):

1998-2002:

Accessibility in the EU FP5 (Applications Relating to Persons with Special Needs Including the Disabled and Elderly)

And: Section 508 of the US Rehabilitation Act is the first act within information technology that includes accessibility requirements in public procurement policies



1999:

Accessibility Guidelines first established in the International Organization for Standardization (ISO)

And: The WHO's ICIDH was revised and proclaims that the issue of disability is an attitudinal or ideological issue requiring social change which at a political level becomes a question of human rights. disability therefore becomes a political issue.

2001:

The Council of Europe (Tomar) Resolution ResAP(2001)1 states that the principles of Universal Design need to be introduced into the curricula of all occupations working on the built environment. The Tomar Resolution definition of Universal Design forms the basis of the definitions in this report.

And: 1 The Council of Europe Resolution ResAP(2001)3 “Towards full citizenship of persons with disabilities through inclusive new technologies”

2002:

e-Europe 2002 Action Plan by the European Commission aims to achieve an “Information Society for All”. The Plan includes a separate action line on WAI guidelines, national centres of excellence, curricula for designers and Design for All standards. The European Design for All e-Accessibility Network (EDeAN) is established as a result. The action plan is followed by the European Council resolution on eAccessibility – improving the access of people with disabilities to the knowledge-based society.

And: ISO Guide 71: “Guidelines for standards developers to address the needs of older persons and persons with disabilities”, forming the basis of CEN/CENELEC Guide 6

2003:

EU Ministerial Declaration on e-inclusion (Greece) states that the overall approach should be based on the principles of Design for All, availability, accessibility and affordability of products and services appropriate to meeting the needs of citizens with disabilities. WAI guidelines, best practices in Design for All, accessibility requirements in public procurement policies and mainstream products and services are main issues.

And: The Malaga Ministerial Declaration on integration policies for people with disabilities states that the main aim for the next decade is to improve the quality of life of people with disabilities and their families. Emphasis is laid on integration and full participation in society, as a participative and accessible society is of benefit to the whole population.

And: European Commission Resolution on promoting the employment and social integration of people with disabilities, having equal rights as other citizens

And. Second version of the European Concept for Accessibility (ECA)

And Initiative: Description: The 1st National Accessibility Plan is a strategic framework to promote and consolidate the measures of the Spanish Government, together with other government administrations and public and private organisations, planning to remove barriers and to introduce the Design for All concept. It was created in the context of Act 51/2003 on Equal Opportunities, Non-discrimination and Universal Access for

People with Disabilities to enable the Spanish Government to foster implementation of this legislation. Its aim, therefore, is to promote equal opportunities and non-discrimination for people with disabilities, while simultaneously improving the quality of life for the population as a whole. The main objectives of the plan are to carry out those studies needed to fulfil the general aspects of the Act to regulate the basic conditions for accessibility and non-discrimination and to promote accessibility. Special attention is devoted to social services, justice, new technologies of information and communication, and infrastructure for leisure and tourism. Activities considered within the plan include awareness- raising campaigns, training on “Accessibility” and “Design for All” in universities, promotion of research in this area and co-operation between different actors. The plan has been commissioned by the Spanish Ministry for Employment and Social Services (MTAS), who will supervise implementation of the plan, but it will not be the only body responsible for carrying it out: many public and private agents have to play a role in making accessibility more widespread in buildings, streets, services and products.

2005:

European Commission Communication COM(2005) 425 on eAccessibility Implementation, contributing to the implementation of “i2010 – A European Information Society for growth and employment”

And: The Third Summit of Heads of State and Government held by the Council of Europe in Warsaw. In the Warsaw Action Plan, the Heads of State and Government agree to “consolidate the Council of Europe’s work on disability issues and support the adoption and implementation of a ten-year action plan designed to make decisive progress in ensuring equal rights for people with disabilities” (Chapter III.1.).

And: The European Union launches a mandate to the European Standardisation Organisations to develop a standard on accessibility requirements to be used in public procurement in the ICT domain (renewed in 2007). Dialogue is on going

with the US with a view to harmonisation of European and US standards, in order to foster a global market.

2006:

The Council of Europe Disability Action Plan

And: The Riga Declaration mentions accessibility and the design of new technologies, supporting EU community action plans

2007:

The United Nations Convention on the Rights of Persons with Disabilities is opened for signature. Universal Design is mentioned in particular under “general obligations”.

And: The European Year of Equal Opportunities for All highlights equal rights and anti-discrimination as main issues. It is backed by information campaigns on relevant EU legislation and Directives. The perspective is broader than disability and encompasses many other groups.

And: Council of Europe Resolution ResAP(2007)3 on “Achieving full participation through Universal Design” is adopted.

2008:

The United Nations Convention on the Rights of Persons with Disabilities enters into force.

2010:

Congress of the Council of Europe in Norway

2006-2015:

Attempt to translate the aims of the Council of Europe with regard to human rights, non-discrimination, equal opportunities, full citizenship and participation of people with disabilities into a European policy framework on disability. The intention is to assist policy makers in designing, adjusting, refocusing and implementing appropriate plans, programmes and innovative strategies.

Several national or regional initiatives accompanied the state efforts to increase awareness. The following few examples are only some of a huge number of exhibitions, meetings, action plans, etc.

2005 – 2007:

*Design for All – the Nordic Programme for Action*

The action plan, adopted by the Nordic Council of Ministers, is based on the principle of mainstreaming, announces Universal Design/Design for All as a crucial

strategy for improving accessibility within the Nordic Council of Ministers and offers 17 measures, which are divided into three parts: an overall strategy; information strategy; and accessibility to the institutions of the Nordic Council of Ministers. The action plan is based on the proposal worked out by the Secretariat of the Nordic Council on Disability Policy. The action plan is aimed at developing awareness within the area of Design for All and promoting systematic work towards full accessibility within the Nordic Council of Ministers, its institutions and, in the long run, of society in the Nordic countries for all citizens. This strategic document implies a change of policy, permanent commitment towards accessibility of all work undertaken by the Nordic Council of Ministers from 2006 onwards, allocation of more considerable financing, necessity of research and assessment of consequences for people with disabilities as part of the planning process. All institutions of the Nordic Council of Ministers that co-ordinate Nordic co-operation in different sectors must implement the action plan and include accessibility aspects in their policies and budgets. All Nordic Council of Ministers institutions must apply the Nordic Council on Disability Policy's competence and experience whenever their work addresses issues of concern to people with disabilities.

Universal Design features: The Nordic Action Plan *Design for All – a Nordic Programme for Action* underlines the importance of incorporating a Design for All perspective into existing and new programmes and action plans for co-operation between the Nordic countries within all sectors and on different levels as well as co-operation with the adjacent areas ([www.nsh.se](http://www.nsh.se)).

2005 – 2009:

The Government Action Plan for increased accessibility for persons with disabilities aims to enhance accessibility for all, and directs a special focus towards persons with functional impairments. These include disabilities affecting vision, hearing, cognition and sensitivity to environmental factors (individuals with asthma and allergies). The action plan is designed to unify and strengthen efforts to increase accessibility to buildings, outdoor environments, products and other important areas of society. The plan incorporates initiatives under the auspices of 15 different ministries. The following five principles form the basis for the action plan:

- It incorporates all important areas of society.
- It is rooted in the principle of sector responsibility. Government initiatives will be co-ordinated.
- Efforts will be based on user participation at all levels.
- Measures and their impact will be assessed on an ongoing basis.

The plan includes more than 100 concrete actions with an annual budget of more than €35 million. €2.5 million is used each year to stimulate innovation and new actions. Budgetary guidelines help to set priorities in directorates and other central agencies. Universal Design features: The action plan emphasises the importance of embedding the Universal Design strategy into government policies and administration, as has already been done in several acts relating to universities, colleges, and vocational school education. The Universal Design strategy will be included in acts for public procurement, building and planning ([www.universal-design.environment.no](http://www.universal-design.environment.no)).

2006:

Tactile Exhibition, Hungary

From 18 March to 18 June 2006 the Museum of Fine Arts, Budapest, hosted a Tactile Exhibition corresponding with the standard and non-tactile exhibition “Sigismundus Rex et Imperator – Art and Culture in the Age of Sigismund of Luxembourg 1387-1437”.

This special exhibition of 23 objects was organised mainly for the blind, but the exhibition also intends to pique the curiosity of everyone with any sort of aesthetic sensitivity. The public was welcome to touch the duplicates of the coins, seals, tiles and statuettes on view in the main exhibition, as well as the re-constructions of a sword, helmets, and clothes from the age of Sigismund of Luxembourg. Audio-guides and Braille texts were also available. This combination of visible and tactile exhibition did not only open the show to the blind, but also gave a great opportunity to children to learn about their history with all their senses and interests.

## Chapter 3: ID throughout Europe

After introducing the idea of Inclusive Design, explaining the historical background and current trends and representatives and giving some definitions for further explanation, it is now interesting to see how the principles are implemented throughout Europe. In this chapter I would like to explain the effects and needs of Inclusive Design according to a specific region, therefore in context with climate, culture, etc ... In general the conclusion of several studies is, that traditional housing complies in basics most with the principles of ID. That means that a comparison between different countries in Europe is always also a comparison of its vernacular architecture.

At this stage we already established the necessity of Inclusive design. Now it would be interesting to understand how easy or difficult it will be to design the new built environment according to the ID principles. Each country has a different law, slightly different attitude and also different existing building matter; features that strongly influence the detailing of ID projects. Nevertheless it is necessary to look and learn from our neighbours.

### **Regulations – an overview**

The principle of all central authorities is “normalisation, integration, equality and high quality of life, regardless of age or capability” (McGraw-Hill, 2001, p.13.2)

Ideally a comparison between Italy, Germany, Norway and England should demonstrate the accuracy of the statement above. For a meaningful result it is best based on the existing building regulations for disabled people. The rules, whether they are called standards, statutory requirements, or guidelines are in essence the same. They mainly deal with the detailing of the necessary floor spaces, maximum gradients or change of levels. Most of those regulations unfortunately are set up considering a person in a wheelchair and a blind man only as the standard stereotype disabled person. Throughout all the different regulations, the aim is to provide a wheelchair user access to houses and the

possibility to move around and inside it without assistance. People with other impairments are not considered or only taken into account whenever demand for special regulation complies with the needs of a wheelchair user. Consequently most of the laws deal with the necessary space for a wheelchair rather than the overall need of a handicapped person. They therefore deal mostly with required minimum/maximum dimensions for turning and the equipment with a disabled toilet mainly, varying a little between the countries. Looking for example at the requirements for free floor space for turning a wheelchair, we find that, although the space might be defined differently: as a circle, a square or a combination out of both, the overall dimensions are similar.







Norway	UK	Germany	Italy		
1.4 m	1.5m	1.5m	1.5m	1.4x1.7m	1.4x1.4m
					

Table 4: Wheelchair turning space in different European countries

The regulations reflect also the situation in the various countries. Italy has larger problems integrating principles of inclusive design in it's antique building structures. Therefore a larger series of possibilities are defined in the regulations to enable to implement wheelchair turning points into the existing structures.

Looking at other parts of the specifications, greater differences in required dimensions appear. The allowed height of a threshold for example is only 15mm in England, 20mm in Scotland and even 25mm in Germany, Italy and Norway. One of the specifications that vary the most is one concerning the dimensions of the accessible path. Regulations are split up in two categories: continuous path and at a point. Minimum dimensions for the first are between 0.75 and 0.9 m, and between 0.9 and 1.2 m for the later one. Also the set-up for the regulations varies (see table below).

Insert table from 13.5 bottom

Germany as the only country distinguishes between external and internal doors (pathway at a point). Whereas internal door must have a clearance of at least 0.8 m, external doors need a clearance of 0.9 m to enable larger wheelchairs as they are often used on the street, but hardly ever in the house to enter and exit comfortably.

As stated before, mobility impairments (consequently the wheelchair user) make up for the maximum of requirements for accessibility in housing. This shows that this type of disability is easiest to understand and control. Clear rules and guidance can be defined and effects seem to be most relevant to housing construction. Unfortunately these observations allow the inference to be drawn that other types of impairments are not sufficiently included in the regulations. Guidelines concerning tactile or colour contrast needs to be developed just as the requirements for noise in buildings, the use of certain materials and finishes and outdoor and indoor signage. Currently such topics are only briefly touched and need further development on a European basis.

The principles of the legal framework are the same in all European countries. The government is aware that the ageing of society brings the need of accessible architecture. Normalisation, integration and high quality of life are the aims of all country leaders. Most of the time, those statutory requirements are given in performance criteria sheets in combination with national standards or technical specifications. Despite all this agreement of goals, the legal system and the governmental approach to achieve those goals vary hugely.

The Italian regulations, the most rigorous ones in Europe, are set through the central government and apply to the whole country. However, Italy is lacking comprehensive building regulations, but the requirements are fixed in a succession of different laws and ministerial decrees, which do have the status of a building code. The grade of accessibility is divided in three levels: Accessible, visitable and adaptable.

1. Accessible: A wheelchair user should be able to enter, move about and use all functions of a building unaided
2. Visit-able: A wheelchair user should be able to enter the building and the individual apartments and be able to access the bathroom and the living room
3. Adaptable: No part of the building has to be accessible, but the planner must show that the building can be made accessible at a later date.

In Germany responsibility for building standards are completely decentralized and belong to the individual Länder (German states). However technical standards are



defined in two main documents: the Deutsche Industrienorm (DIN) 18024 and 18025, which are used by those German states that elected to do so. The German state of Hesse has the most rigorous building regulations regarding barrier-free building. It requires barrier-free access all houses over four stories. Germany is one of the nations that carried out a large number of research and evaluation studies. The results and implementation is to be seen in the near future.

Economic incentives for barrier-free housing are provided through the Norwegian State Housing Bank. The bank's incentive is strongly based on recommendations of the Norwegian Society for the handicapped and the Norwegian Building Research Institute. Buildings that comply to the requirements set by those organizations are eligible for funding. This model has been successful over the last 15 years, financing some 80% of all new dwellings over the last 50 years. Building code and regulations are centralized documents, but have no direct influence on the incentives.

Similar to Norway, regulations are as well centralized in England, although with variations throughout the UK. The existing standards are newly integrated in the building regulations (part M of the regulations). Before multistory buildings didn't even need an elevator and economic incentives didn't exist. This changed over the last 10 years and a similar model than the one in Norway was adapted.

### **Cultural differences and traditions – a typical ground floor layout**

As mentioned in the introduction of this chapter, one of the main problems comparing dwellings throughout Europe is the diversity in culture and building tradition. As demonstrated before, most regulations deal with the floor requirements in accessible housing. Therefore it is clearest to explain national differences looking at the floor plan of a typical flat / house and develop a discussion concerning barrier-free buildings from the differences between the traditional plans and their adaptability to barrier-free design. In general it can be said barrier-free housing does not differ a lot from traditional housing in any of the five countries. An exception might be Germany where planners have difficulties to integrate the space requirements given in the DIN, mainly due to an increasing floor space in the living room. Most of the times, throughout all the countries nevertheless, a larger bathroom and slightly wider halls is the only greater change that must be included in the floor layout. Especially in Italy, where bathrooms in flats are usually rather big, those conventions hardly ever create spatial problems to the planners.

And the rest of the rooms itself are usually by custom already allaying to barrier-free building regulations.

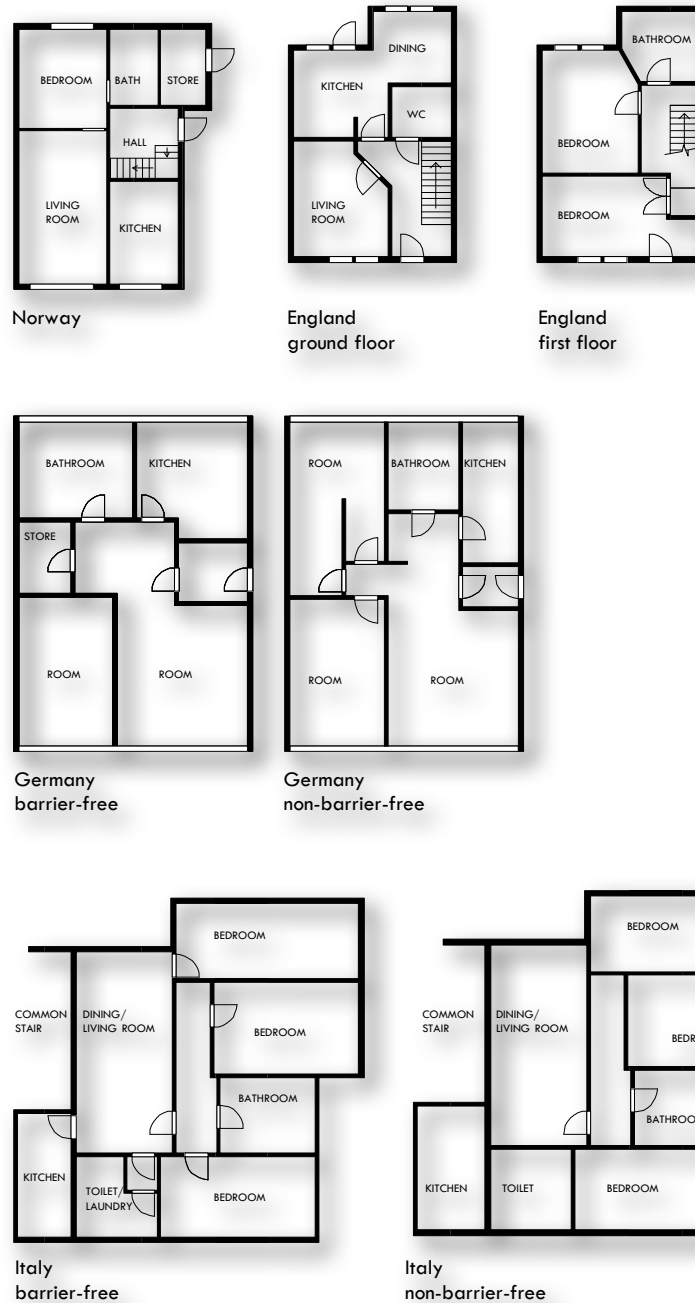


Table 5: Typical floor plans in different European countries

In the UK, where narrow terraced houses are typical, vertical circulation might cause problems. Barrier-free housing shall either have all the main services on one floor or have an elevator making it easy for the disabled and the elderly to reach all floors in the property.

To fully understand the impact of barrier-free design or even ID, it is necessary to have a closer look at the traditional floor plans in each country. Firstly this is not for a matter of accessibility but rather to understand the typical circulation and habits within the different cultures.

### **Looking at the various rooms individually**

The discussion here focuses mainly und the housing standard. The principles of Inclusive Design nevertheless are the same as well in public buildings as dwellings. The choice of focus und the private house is simply because it is best to distinguish between the countries. Public buildings, offices, etc. these days follow a rather global design. The floor plans to be compared here are the following: Firstly we look at a ground-floor plan of a Norwegian 2-story detached house with three bedrooms, bathroom and some storage space on the top floor. Then we look at apartments form a typical block of flats from Germany and Italy. The English example is a typical terraced house.

#### The corridor vs. open plan

The modern apartment has, similar to office buildings and other dwellings today, a rather generic open floor plan. Looking back into more traditional housing, significant differences in the floor layouts can be seen comparing the four countries. They represent different values, habits and climates. Despite being an interesting field of discussion this chapter will exclusively focus on the accessibility of the spaces, not on the cultural, social function of individual rooms. Looking at the typical floor layout of flats in the five chosen countries, following observations can be made regarding the entrance and corridor of the dwelling: Norway and the UK have one of the most compact housing layouts with a small central corridor with the corridors taking up between 4.5 and 6 sqm compared to 10 sqm in Germany and Italy. Today Norway's building layouts have a tendency to be open plan and therefore show no restrictions per se regarding accessibility. Nevertheless the older, traditional housing is extremely small and therefore often inaccessible for wheelchair users. The least modifications need to be made to Italian traditional housing. Wide corridors and generous bathrooms have always been part of the family home and support the need of space for ID. The UK sees

the most drastic changes in its dwellings. Due to the habit of living in 2-3 storey detached housing with very narrow stairs and corridors, moving around is a problem for some. Nevertheless this absolute need in change generated a great community of supporters for ID, fighting, publishing and introducing architecture and architecture refurbishment to be accessible for all.

## Bathrooms

Similar to the corridor, the Norwegian and UK dwelling shows the smallest bathrooms. In Germany standard DIN regulations ask for a rather large bathroom and in Italy the use of the Bidet implicated the design of larger bathrooms in general. Nevertheless the standard bathroom is too small to be considered an accessible bathroom and would have to be modified throughout all building types. Germany having some of the more generous buildings regulations will have to enlarge the typical bathroom the most, as can be seen in the floor plans shown.

## Kitchen and living room

Living rooms in Germany and Italy are usually big enough to be able to integrate an accessible living room. Norway and the UK, usually building more compact dwellings will have problems to convert a standard living room into one that follows the principles of accessible design.

In most cases, independently of the location, kitchens are too narrow for wheelchair users. The more typical problems within a kitchen nevertheless cannot be discussed within the floor plan, but a look at the elevation of the kitchen is necessary. Principles here are rather based on the palpability of kitchen appliances and storage spaces.

As a conclusion it can be said that regulations for barrier-free housing in all five nations provide access according to the broad principles of ID. It can be seen that requirements comply to the existing and traditional housing standard, even though these structures vary immensely. Most of the times, ID seems to be the outcome of a pragmatic design in combination with building tradition. IN former times the whole family lived under one roof and everybody, from the child to the grand parents had a productive role to fulfil within the family. The house therefore needed to be useable quickly and efficiently to everybody leading to practical floor layouts and space design. For this reason vernacular and traditional architecture are still inspiring today and a very good base for the research on ID.

## ITALY

### History

The idea of accessibility in Italy is more driven by the need of modification of the already built than the amount of new built property. With a high percentage of old city centres and post-war industrial areas, a vast amount of buildings are not accessible at all to a huge amount of people. To solve the problem a series of ambitious additional regulations for the new built as well as for the refurbishment of existing buildings were made. An overall law containing full regulations does not exist, even though main steps on the way to an universal environment can be defined. Stepping stones were:

DPR 384/1978: which states that architectural barriers shall be removed from public structures, such as schools, social buildings, transport structures, ...

Law 41/1986: which forces plans for accessibility to be put in practice (law has been revised 1992)

Law 13/1989: which determines that private and residential buildings shall be accessible or adaptable, as well in the new built as in rehabilitation

Law 104/1996 and DPR 503, 1996: which are revisions of earlier regulations regarding the removal of architectural barriers in buildings, spaces and public services.

Like other European countries, Italy understands the miss-leading expression barrier as architectural barrier. Barriers are far more than simply architectural. Barriers are also designs that hinder the user to orientate himself or simply use individual items due to malfunction and bad industrial design. Italy, as mentioned above still has a great amount of historic cities. These cities for example are not planned and house numbers sometimes are difficult to find, as entrances are in back yards or the sequence of numbers is not logical. Barriers in Italy today are defined as follows:

- Physical obstacles: cause of problems to unhindered mobility for all users
- Obstacles that limit comfortable and safe use of space, equipment or components
- Lack of symbols and signals for orientation and way finding as well as for the quick identification of sources of danger for all users

Nowadays authorities understand, that universal design is more than removing steps / adding a ramp. It means to systematise the built environment, so people with all sorts of different handicaps, can take full advantage of the built world.

### Application of rules

Italy, more than most other countries understood the need of applying these laws and strategies to all sorts of human environment, e.g. parks, archaeological sites, tourist areas, ..., but unfortunately there is still a big gap between the understanding of the need and the actual, real application. One example to demonstrate the amount of work that would have to be done to great Italian heritage is to modify entrances to churches. Thousands of churches would have to be re-organised, an almost impossible undertaking. But there are also some examples, that show that the attitude is also not there yet, that accessibility is not a right for everybody already. The cathedral of Milan for examples charges 5 € for stair access to its beautiful, visitable roof. The same ticket for the elevator costs 7 €, charging 2 € purely for the 30 second service.

The concept which the Italian authorities try to implement, is very much the same as the American universal design means, but unfortunately there is not much coherency between the law and reality.

#### Social responsibility

Another indicator that full universal design is still far away is the lack in social responsibility throughout the country. Where the government tried to lead a path into a future for all, people and enterprises are still far away from acknowledging the necessary actions. Car drivers are driving or parking on pedestrian ways, toilets are tucked away, very small and often to stand and many more. Italy is not the only country to face barriers through socially irresponsible actions, but it shall not be forgotten, that it does. Huge companies like ATM, Telecom and local planners are not working together to place phone boxes at a tram stop under the street light. Urban equipment is unorganised and therefore not always easy to find or to use.

#### **Germany:**

Germany is neither at the forefront of ID, not is it behind in its developments. The situation in Germany nevertheless is far different from Italy. After the WWII, destruction was immense and the need for new housing very large. This lead to a very quick built up of very cheap dwellings and estates. Most of the estates are already taken down again or are to be taken down in the near future. Refurbishment and preservation of property is therefore not a major issue. Instead Germany is facing a growing percentage of elderly people due to a drastically falling birth rate. This is clearly proven by a figure from the Bundesinstitut für Statistik (National Institute for Statistics) stating that Germany will have 12 Mio. inhabitants less by 2050 reducing the overall populations from 82 Mio. so 70 Mio.

Furthermore Germans are very loyal to their living environment, especially their private dwelling. More Germans than any other nationality prefer to modify their private house to suit their needs in high age than any other. This behaviour is seen as a very positive as it means saving on personal for care services, the building of state funded care homes for old people and the possibility to stay in the desired environment, living life independently as long as possible.

To support the idea of life-long independence several national funding schemes for barrier-free building and modifications were introduced. The difference to other countries e.g. the United States is, that grants are not only given to individual cases through a private organisation, but a comprehensive network of support through state, insurance (state and private) and private organisations is given. This might result in taxation subsidy, special community programs or the financing of technical assistance through health insurers. State subsidies are available for people modifying their own home as well as developers or private investors that are willing to build barrier-free property to rent.

Another interesting point about Germany's approach to ID is the launch of the certificate "Comfort and Quality". The certificate was introduced in March 1999 as tool to implement more successful barrier-free housing and to help for the purchase of quality ID products. It was developed by the German Society for Gerontechnology (GGT) and the TÜV Rheinland Product Safety GmbH (TÜV) as a tool to assess not only the functionality of a product, but also its quality. For the first time, ahead of others, Germany had not only an institute for product evaluation, but had an institute to guarantee ID standards. The testing people in the institute are mainly elderly people, but the specification for a product to achieve the certificate "Comfort and Quality" are far beyond designing for elderly people. The first company to have their products tested and accredited was Hewi, a company known for their high standard of barrier-free design throughout Europe.

## **Norway**

Norway compared to other countries sees a far more comprehensive approach to ID. This can be seen in a vast amount of free information brochures covering all different types of media. Some of the brochures are attached at the end of this work for demonstration. Once a year, all TV station, newspapers, etc. dedicate their time or paper space to ID, demonstrating to a broad audience the need of accessibility for all and consequently the integration of everybody. On the same day, various institutions will take round, visiting houses, where they leave information material, stay for first hand consultation and collect donations. More

than 20 Mio. USD are to be collected every year on this day, supporting disabled people and the integration of other fringe groups.

In 2012 the next major international conference of universal design will be held in Oslo and the country is preparing to set a new standard to ID. Government as well as private organisations are taking another look at ID, its success so far and try to integrate new aspects to ID. Therefore Norway is one of the few countries to take environmentally caused disabilities as asthma and allergies into account.

Another interesting aspect about Norway's ID policy is the housing structure and funding. As Norway never faced a lack of housing supply, which had to be covered quickly nor was it confronted with limited space, the typical 1-2 storey housing still exists in Norway. This is also valid for new built property. State funding as well as funding from banks support the built of those smaller properties by private owners. As the state scheme is sufficient enough to support families with lower income, basically no social housing exists and the debate about ID in mass housing is little issue to the healthy nation.

The following chapter will amongst other show a few Norwegian governmental initiatives.



## Chapter 4: Interrelation between the property development and the inclusive environment

This chapter takes a closer look at the participants of the design process. We have not understood, what ID is, how it developed and why it is so important. Here it will be shown how everybody that is involved in an architectural project can contribute to a successful, accessible outcome. Therefore the roles, power and responsibility of the following groups will be examined:

- Legal authorities
- Developers and planners
- Architects and Designers

Case studies and examples will prove that any group of stake-holder to a project is directly responsible for a successful built structure and therefore ID is not one aspect to consider for the architect or the government, etc. only.

### Legal authorities

Legal authorities decide on the framework of the built environment by determining building regulations. The aim of building regulations is to ensure buildings and living environments suitable for the average person. Statistically most people fit in and therefore they have to be suitable for every citizen and visitor. The set of rules needs therefore to cover every possible type of building, every possible type of user. They must literally be applicable to every stone laid out by humans. For a long time using an average person was the base for guidelines, but recently governments, building and environmental authorities realise that by doing so, they are leaving significant “non-average” user groups aside. Meaning that the non-average can’t take full advantage of the built environment. Today, freedom of movement and equal, independent access to the built environment is a human right and should not be simply a moral idea, governments realise, that they need to act on providing the granted freedom of movement.

New initiatives and actions taken by governments include either a change of building regulation to be more suitable or the addition of regulations for barrier-free or accessible architecture. But also other initiatives demonstrate the shift in thinking of the authorities:

One example of municipalities using Universal Design as an overall strategy can be seen in Norway.

The main street of Trysil, Norway, is designed according to Universal Design principles. A municipal design manual has been developed with Universal Design as a principle to guarantee good accessibility for all, pleasant design, enhanced environmental opportunities, sustainability and increased traffic safety. The main street of Trysil displays now reduced vehicle speed, safety measures for pedestrians, accessibility details like tactile ground paving indicators and crossings implemented according to Universal Design features in the design manual. The extensive use of the colour red in the main street is the designer's link to the numerous red farming buildings in the area. None of the above principles hinder the architect or planner in creating a great environment, but it is the authorities to guarantee, however the designer will do his work, that everybody is as safe as possible and can use his surroundings as well as possible.

Another initiative by a network of Norwegian municipalities. The idea is to control the main instruments for the development and implementation of Universal Design. Therefore 16 municipalities have been chosen as pilot municipalities for Universal Design. Supported financially and administratively by the government, the municipalities aim to implement Universal Design as an overall strategy in policy-making and planning. The city of Kristiansand, with long-lasting achievements in the field of accessibility and Universal Design, serves a mentor to the municipalities. The network also includes representatives from the government, government directorates, the county administration and NGOs. The municipalities in the network comprise a cross-section of Norwegian communities. Small rural municipalities as well as cities are represented. The experience and knowledge acquired in each municipality and in the network as a whole serve as a basis for national recommendations, guidelines and instructions for the future.

The network is part of the Norwegian Government's Action Plan for increased accessibility for persons with disabilities, Plan for Universal Design in key areas of society. Universal Design features: The network emphasises the importance of embedding the Universal Design strategy into municipal policies, planning and administration. Creating environments with Universal Design qualities is the main objective. The first testing phase was from 2005 until 2009, since then constant

improvements were made and further knowledge of how to tackle ID issues was gained.

Another initiative in Spain was taken in 1999 by the Institute of Elderly and Social Services (IMSERSO), Ministry of Labour and Social Affairs in Spain. It has created a framework of collaboration with ONCE, the Autonomous Communities and the Local Authorities, to develop local and regional plans of accessibility. The schemes were based on the concept of global accessibility, including access to communication and information services. Within this framework, several agreements have been signed since 1999 with local and regional authorities to establish action plans and to define implementation mechanisms. This framework includes guidelines to implement measures for the education and training of public employees and to work out reference documents. An outcome of this action is the *White Book for the inclusion of principles of Universal Design into the University*. Universal Design features: Plans of Accessibility presented by local and regional authorities are based on Universal Design principles, considered to be the strategy for achieving global accessibility. Universal Design is taken into account from the planning phase onwards.

This example shows clearly the difference between the ID principles and common building regulations. Once again, ID is not made to determine a certain way of building or designing, but it is an attitude, a way of thinking that once understood enables a comprehensive accessible approach to the most diverse aspects of design.

### Developers and investors

Surely it is understood that developers and investors are setting the basic rules for any type of building project. The overall scheme, floor requirements and many more are determined by the developer's wishes. Participants of a project dealing with money will always find themselves in a conflict of giving the extra space to make a building fully accessible, even if this results in a loss of rent. Instead of getting caught up in a detailed argument about the exact amount of floor space, I would like to present two case studies. In both projects, the developer decided to not aim for the greatest amount of let-able surface, but had a rather comprehensive look at the building project and its future.

In both cases care was taken and an overall strategy for the building site and its users were defined. The first case is the Bluewater shopping centre right on the outskirts of London. Special care was taken to make the whole building fully

accessible and clearly laid out. In the second sample, the residential quarter of Hasenberg, a now newly refurbished quarter in Munich unfortunately shows how, despite best intention and careful planning a project can fail.

### CASE STUDY 1: BLUEWATER - AN ACCESS-SUCCESS

With society getting older and disabled people having more possibilities of moving around, disabled or handicapped people become more and more important as shop clients retailers and commercial quarters are getting gradually more interested to cater for literally everybody, as every person, that wouldn't be able to access the shop floors, means missing out on potential money spent. Consequently the attitude of investors and developers are changing now. A modern example of accessible shopping space is the Bluewater retail development in Dartford,UK.

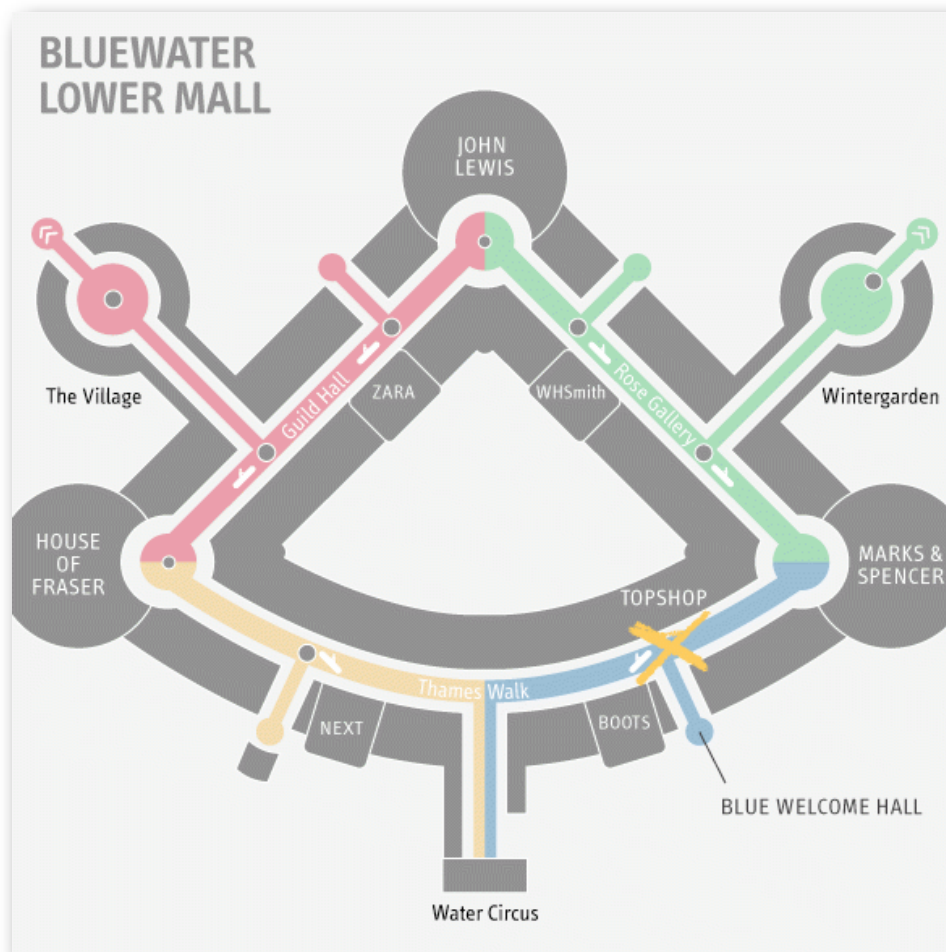


Image 6: Schematic plan of the Bluewater shopping mall (nts)

The development is a 100 hectare out-of-town development containing 154,000 sqm retail space with about 30,000 consumers on a normal Saturday. Planned in 1994 and opened in 1999 it is the largest shopping area in Europe composed out of three tied-in shopping malls with overall 320 stores. The 350 Mio. pound sterling project was supposed to be "one of the finest retail experiences in Europe, a place where everyone can come to and feel at home." (Eric Kuhne, architect at Bluewater). The project was initiated and implemented by the Australian company Land Lease. The objective of the developer was social inclusivity by designing for the diverse needs of everyone visiting the malls. The project manager states in an interview: "we're not claiming that we're going to get everything right. We started off with a set of aspirations ... we regarded disabled people as an important part of our customer base, and it was always the intention to provide the best for them."

Consequently wider car park spaces, increasing sight lines and slopes never greater than 1:15 have been integrated. The architects state that they have done the best they can to ensure easy access for everybody.



Image 7: The Bluewater accessibility scheme: No necessary steps, wide paths and easy to read signage



To get plans and features right a lot of meetings and discussions were held at the beginning of the planning stage. Focus groups were invited to make sure, no customer group was left out or simply forgotten, but the outcome was actually "what people want" according to the Bluewater project manager. A building control officer from the local authorities states that "you've got to take your hat off to Lend Lease, they have a different approach and they're very keen to be good corporate neighbours and they see it as a partnership with the local authority and the local community. This generous approach is very unusual as most developers try to decrease non-let-able floor space and therefore integrate only the minimum legal



Image 8: Well illuminated gallery at Bluewater

requirements. Disabled people are usually meant to be too little of a potential consumer to be included as target group in a retail scheme. It would usually be called a waste of floor space. In contrast, Bluewater architects had the task to "make the place right for everybody" not just 90% of the people. Lend Lease even got so far to tell the prospective tenants that they have to conform with the Bluewater philosophy and access standards. It wasn't allowed to simply put the usual high street store into Bluewater, but adaptations according to the "Access for

All" - principles had to be made. A special tenant's manual was sent out telling everybody how to design their shops and other things. The manual is not a legal document, but advises the tenant to reflect on the corporate ethos.

The Bluewater development was one of the first ones to be built under close observation and influence of an access group. The group accompanied planning and building of the immense property and their ideas were actually taken on board, especially when it came to the design of car park, layout and drop off points. The retail development contains a shop mobility centre that gives out basic wheelchairs for free and a lot of other technical help against fee to disabled people. Those gadgets can be pre-booked or, if available, simply taken after arrival. Further care was taken in the choice of colour tone contrast, floor materials, reduced glare, ... . Tenants were asked to have shops without any changes in floor level and a larger entrance door than usual.



Image 9: Shop with wide entrance and no treshold at Bluewater.

Many developers accept part M of the UK building regulations as necessary, but sufficient. The developer's at Bluewater nevertheless state, that the manual is 20-30 years old and therefore simply out of date. A document like this can only be

a basis of discussion, but the building needs to make sure, that a higher standard and a state-of-the-art access is installed.

For further information look at: [http://www.bluewater.co.uk/content/cu\\_access](http://www.bluewater.co.uk/content/cu_access)

## CASE STUDY 2: HASENBERGL, MUNICH - FAILURE DESPITE BEST PLANNING INTENTIONS

The quarter Hasenberg in Munich was founded in the 1950s as a settlement for the poor man. It was expanded and a new master plan was designed in the 1970s. Even though the area was new and the apartments were state-of-the-art social and low budget housing, the estates were little attractive as they were lacking necessary infrastructure and services. Finally the area showed the highest rate of criminality in Munich. The area was redeveloped recently and is now a save, pleasant residential zone, whose reputation unfortunately is still dominated by it's poor past rather than the actual state.



Image 10: Aerial showing the Hasenberg estates and the parks

In retrospective several mistakes have been made by the developers of the former 1970 project can be defined. The idea was to build a new pleasant living quarter for people and families with a lower income. The apartments shall not only be functional, but the area was supposed to be also attractive for the mainly young inhabitants and young families. Therefore large green areas were built in between big apartment blocks. The purpose was to give the inhabitants free space to use it as a modern public garden to spend leisure time and meet.





Image 11: Masterplan of the Hasnberg estate.

But unfortunately the space was out of scale for a garden. It was rather a park and people used to cross it, but not live in it, which was mainly due to the fact that there was no encouragement to go there. It was empty space between the buildings. This led to an island effect regarding the residential buildings. People from different blocks wouldn't meet and encounter. Instead they lived like strangers next to each other. With a high percentage of foreigners, scepticism and fear were dominant and grew stronger. This atmosphere led to grouping of youngsters according to blocks and finally gang building. The great idea to create a huge public communal space was too little controlled and led to aggression instead of peaceful outdoor living. Today kinder-garden, social centres, etc. were built in between the houses, connecting the zones and creating a successful public and social life.

## Architects and Designers

After all the explanation above, it is clear, that architecture is determined by many institutions and actors. The architect itself is only one amongst them and his role in the development process or in the design of the built environment is therefore limited. Neither is the architect a supreme leader who has complete and single control over a project, nor is he a passive player in the construction field. To understand the architect's power and influence on ID it is firstly important to define the role of an architect in the construction and property field. As stated before a building project is determined by laws, regulations, statutes, corporate clients and personal wishes of clients and developers. The architect's role, more than anything else is to find the best compromise between all the opinions and to then design a well-functioning, satisfying project. In that sense, the architect's power is very much as well as very little. Looking back at the Bluewater project: The developer wanted to cater for disabled people as well and the Part M of the UK building regulations was not sufficient to them. The architect here had the chance to work together with the access group and create some truly accessible space. In other malls it can be seen that mobility was not considered too much. The developer would not define disabled people as a consumer group big enough to consider. Here it is the architect that needs to carefully plan the property to make sure that access can be guaranteed despite or along with the developer's aims. The architect can therefore function as a pusher to bring a good effort to an even better end or to avoid mistakes in the built environment despite attitudinal and financial obstacles. It is the architect's duty to do the best he can within the given project (team). It then depends on the architect how far a project is to be designed according to ID standards. This depends mainly, as in every other part of the development process, on the personal attitude of the architects. Some would really have a good understanding of the needs of an inclusively designed space, others prefer to design something very beautiful without worrying too much about how the building works in reality. Like any other stake-holder the architect cannot be defined as a stereotype person with a certain aim or opinion. Nevertheless some guidelines, some responsibilities can be defined to explain the architect's role in the process of inclusive building design.

The two major case studies above showed examples of very large scale projects, driven by ambitious planners and developers. Following a few smaller examples of implementation of ID principles in which architects and designers played a crucial role.

### **Bode Museum entrance stairs**

The entrance to the Bode Museum, one of the historically preserved museums on Berlin's Museum Island was to be refurbished. Consideration was made to preserve the existing structure of the building as well as enabling access to disabled visitors. The new stair elevator is visually integrated as well as clearly visible and does not disrupt the neat appearance of the building front



Image 12: Elevator at the entrance to the Bode Museum

### **Metro, Munich - Color for Orientation**

When the concept for the Munich metro station was developed many years ago, it was determined that the design of the metro stations should all be different. This would make it easier for people to recognize their station and find their way around. Furthermore it would be more pleasant and give the user a sense of real traveling if the destination looks different than the departure point. The station can then be associated with the quarter and are active parts of it's appearance and identity. Another interesting fact, less relevant to ID is the actions, the MVV (Munich's metro association) took against hang-arounds and drug addicts in their stations. They started playing classical music there. The average user would not

be disturbed by the music, but the unwanted groups of people would not enjoy it and not return. This concept works without additional service staff, CCTV or any other typical security matter while at the same time adding atmosphere to a station; A method worth mentioning.

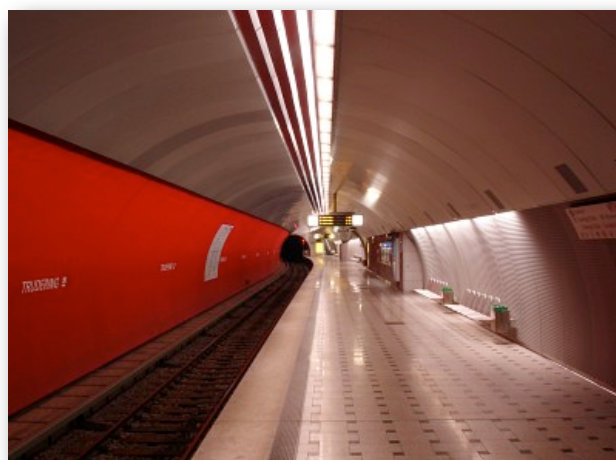






Image13: Metro stations in Munich

### Home for the elderly in Ems (Switzerland)



Image 14: Front facade of the home for the elderly in Ems

Another example for the thoughtful design of ID space is the home for the elderly in Ems. It does not only strike through modern and appealing design from the outside, but is a great success from the inside as well as all rooms have access to balconies and large windows looking right onto the beautiful mountain scene. For guests that would like to meet and have a more social life, a vast amount of meeting and activity spaces are integrated, also featuring large, room-height doors and the great view. The side shown on the photo shows the bedrooms, the common rooms are facing the other side. Every floor contains activity spaces, that

are distributed along a braid corridor. That way, guests and inhabitants cross social spaces all the time, adding natural activity to the quiet place.

### **Philharmonie, Luxembourg**

Description: The three halls of the Philharmonie, the Grand Auditorium, the Chamber Music Hall and the Espace Découverte have been designed to accommodate all spectators, making no distinction between people with or without reduced mobility. Universal Design features: People with or without reduced mobility can enter the Philharmonie through the same main entrance and follow spacious and lightly inclined access routes all the way to their seats in the three halls. All concert spectators and visitors benefit from the visionary project of architect Christian de Portzamparc. Limitations: It should be noted that the wide, long ramps characteristic of the halls of the Philharmonie require a building to have ample space and floor area. In operation: 2005.

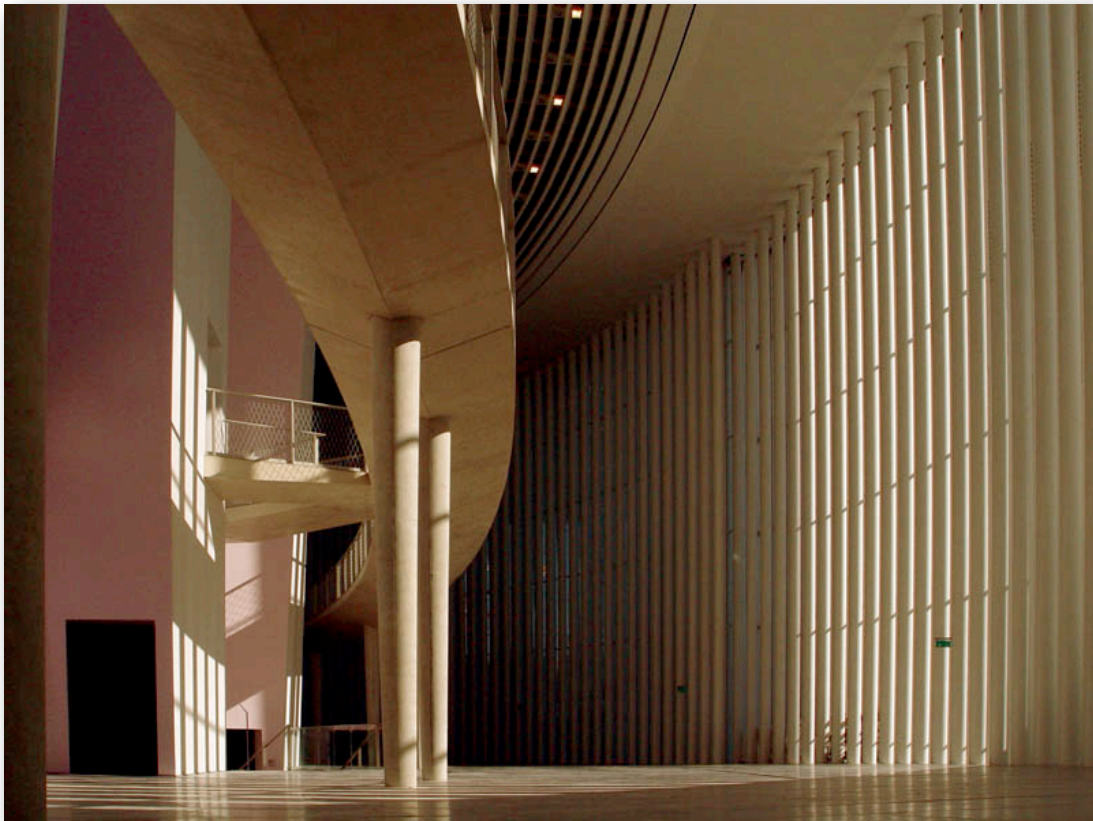


Image 15: Foyer and ramps towards the galleries in the philharmony in Luxembourg

The presented building project are only some of millions of properties implementing ID principles or at least, as in the case of the Hasenberg estate is trying to implement those. They demonstrate, that every member in the planning, design and building process can make a difference and therefore has a responsibility for the success of a project. Furthermore projects like the Hasenberg or the Home for elderly persons demonstrate, that not always money issues are crucial for the success of an ID driven building project, but the understanding of human behavior and abilities. The range is so large that building regulations and guidelines aren't adequate as they would again be limited to describe spaces for the average disabled person. The introduction of principles instead communicates a certain adaptability that is necessary due to the matter itself.

In the following chapter I was using the Schindler Award 2010 for graduates as a basis to apply the principles and show, how simplicity and thoughtful arrangement combined with modern technic enable free movement, orientation and use of space for everyone.

## Chapter 5: The Schindler Award 2010

Basis and initiator for the discussion about Access for All and finally for this thesis was the Schindler Award 2010. The biennial award competition is organised by the Schindler Group, which is developing and selling assistive technology for architectural projects. The aim of the competition in 2010 was to restructure and modernise a rather leftover and clustered site at the west end of the Olympic Park in Berlin. The competition with the title “Access for all” asks for the design of a modern urban scheme catering for everybody, but focusing especially onto the disabled. With a combination of several tasks, this competition is one of the most diverse student competitions to be held. It requires as well an overall strategy for the site, as well as the rebuilding of a train station, the modernisation of an open air theatre and the building of a new hotel. Doing so, the competition requires attention on all levels of architecture from urban design to the details of a semi-public building.

A full description of the award and winning entries can be found in Appendixes 3 and 4. For the purpose of the thesis, main issues were selected. The various topics on different scales shall similar to the built examples above explain the implementation of ID in the built environment.



## I. The Site

The competition site is located in the west of Berlin between the Bezirke Charlottenburg and Wilhelmsdorf.

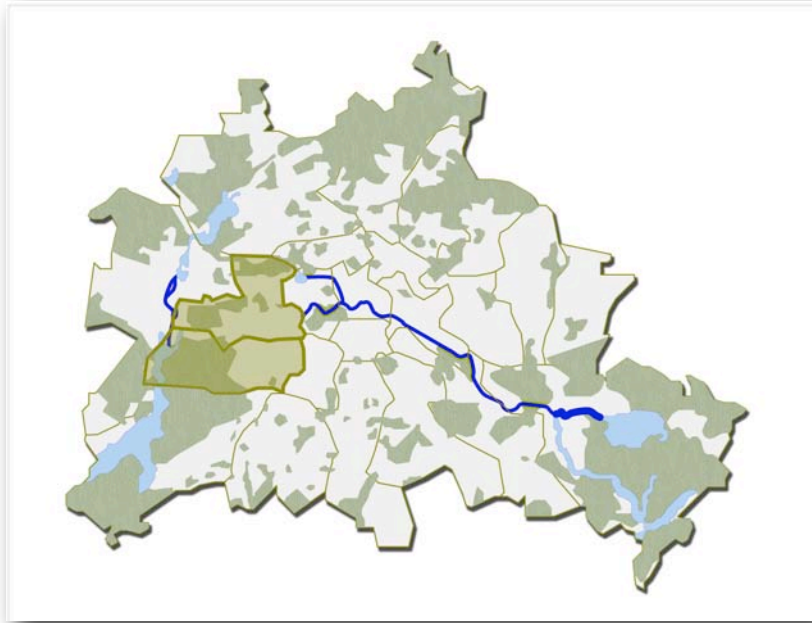


Image 16: Location of Charlottenburg and Wilhelmsdorf in relation to the city borders



Image 17: Location of the site within Charlottenburg and Wilhelmsdorf

The site is at the west side of the Olympic stadium right on the boarder between the two Bezirke. It is well connected to the city through main roads and the S-Bahn station. The surrounding is very green with a mixture of parkland, woods, smaller rivers and lakes in little distance only.

## II. Spacial Elements of the Competition

The competition brief contains the following elements in order from larger to smaller scale:

On an urban level: the competition requires a new master plan. Therefore some buildings are to be demolished, others (re-)built and again others modernised giving the area a unique identity. Furthermore traffic and parking need to be organised. This part, dealing with the organisation of movement and the connection of spaces will be discussed on the basis of a master plan drawing.

On a smaller scale, the competition deals with the circulation of the visitors of the Waldbühne theatre, located at the North-West of the site. On occasions during summer, 22.000 spectators need to commute from the South-East located station to the theatre entrances. New, easy to find pathways, easily readable signage and full access to all buildings are required. To create comfort and safety as well during busy times as during quiet periods poses a major challenge.

Train station and open air theatre shall be modernised. the S-Bahn station shall be demolished and a new station, that is well connected to the area and fully accessible shall be rebuilt. Train design is not crucial for the scope of the works. The theatre shall cater for disabled visitors as well as artists. The main task is to install accessible vertical circulation and fair seating for disabled visitors.

Furthermore a hotel, that is accessible for all shall be designed. The principles implemented in the design will reflect the general strategies, demonstrating the possibilities of inclusive design in a semi-public space.

## III. Competition Entry

### Description of site:

The site is located towards the west of the Berlin Olympic Park, at the boarder between Wilmersdorf and Charlottenburg. The residential area to the south and the west is separated from the site through the channel of the S-Bahn.

The site shows a great potential through its dominance of forest and listed architecture. Nevertheless both elements need careful attention: the forest leads down to the Murellenschlucht, which is steep and difficult to access and the impressive architecture was built during Hitler for the 1936 Olympics and therefore carries a controversial meaning. The streets are quiet and open the possibility for great pedestrian and cyclists access.

Problems on site are numerous and have to be dealt with in different scales. The platform on the West of the Olympic Park in Berlin is characterised through a clustered arrangement of facilities and has to be reorganised to develop meaningful space. At the same time parking needs to be rearranged, so that green surfaces will not have to be used. Now cars are parking in a rather random manner on various green surfaces.

Furthermore the site has no meaning for the residential area close-by. Sportsman now arrive directly to the particular centre without any encouragement to stay longer within the perimeter. Fences and entrances block and open in different directions. This leads to an unfriendly appearance and confusion and consequentially needs to be avoided / reorganised.

The ways between the buildings are small and uncomfortable. They need to be redesigned. The site is not highly frequented apart from event times, which is mainly due to the lack of open facilities. large, semi-public structures with hardly any inviting design on site.

#### Aim of the project:

Main focus of the competition is to from enable access for visitors and locals. Therefore the goal of the project is to create a friendly space that caters as well for a big crowd during event times as for a smaller amount of people throughout the year.

Innovative outdoor space shall be created on a major square for the younger generation to meet and stay at the open spaces. It could also cater for markets and smaller local events. Gastro facilities will encourage sportsman, hotel guests and resident to stay and spend more leisure time consequently filling the area with more activities and life. Additional even space nevertheless is not scope of the thesis-related works.

#### Overall strategy: Axis of Access

The overall strategy is to create a central path uniting the site through a pathway that connects all the facilities on site. Entrances or second entrances can be found along this path giving the site direction and easy to understand order.

The appearance of the pathway shall not be a simple street, but change in appearance according to its position on site. It will start as a piazza in front of the station becoming narrower to host a row of market stalls and seats. It will be leading straight onto a bridge, where the narrowest point is and then become wider again to form the entrance to the Waldbuehne as well as leading down to the existing street approaching the Glockenturm.

Entrances of the buildings are /will be positioned along this axis. The interventions along the axis will be rather small. A range of outdoor settings (table tennis, seating, ...) will be placed along the axis on crucial points to encourage stay also during days without event. The centre shall be useful for the younger inhabitants of Wilmersdorf and Charlottenburg to be able to gather freely and without the need of consumption.

#### Arrival:

Cars are to be left in the underground parking which is connecting the facilities around. Entrances to the underground parking are at every side of the plateau, so there is no need for cars to enter the site and free, save movement for pedestrians and cyclists is possible. Bike stands will encourage cycling

#### Building strategy:

The buildings will be set back towards the top, just like it's already done with the Hockey stadium. This is done for two reasons: one is to avoid straight, overly high facades, that create a rather cold, less welcome feeling. Second: the lower building parts will be covered with a green roof. the buildings will be seen as well from the ground as from the top of the Glockenturm. With the partly green roof the image of buildings set in the country side shall be emphasized. All entrances will be facing the axis of access. Different entrances will have different colours, so they can be distinguished easily. (eg. metro grün, tennis rot, riding yellow hotel blue, ....)

#### Main piazza:

The main piazza is vast enough to cater for a big flow of people, but at the same time is attractive for a small crowd, visiting the gastro facilities on site all year round. The square is also a good size to host a small market (eg. vegetable market, flea market, christmas market) and form a meeting point for the community close-by.

The landscaping of the main square is rather abstract and designed in a very geometrical manner to form a clear contrast between man made landscape and the natural surrounding. Situated in the forest and surrounded by a great variety of

different buildings, the landscaping needed to have the potential to connect areas visually and add some clear structure to a site, that is missing the obvious grid lines.

#### Lightning + color:

The site is furnished with traditional street lightning, which is sufficient for cars, nevertheless not enough to guide pedestrians through the area. The new lightning system consists of two elements: Top lights and ground floor lightning. Top light guarantees the illumination of the overall space and will contribute to a save environment. The ground floor lights are positioned under the benches and between the trees and will form a line from the S-Bahn station to the entrance to the Glockenturm. This rather sculptural approach shall contribute to the safe crossing of the space, showing very bright the walkway, while at the same time function as decorative lightning adding to the beauty of the site.

The different buildings will have lightning in different colours. The tactile map next to the station shall be colour coded as well to enable people with difficulties in orientation to find their destination simply by looking at the colours, then following the axis of access, where they find every single entrance. For the Horst Kolber building i suggest an entrance gate containing the lightning.

#### Hockey stadium:

The hockey stadium was never fully designed, but should have he following qualities: It should no new design, but integrate the existing plan. Would be located facing the Murellenschlucht to encourage the Axis of Access. Be aware that people with impaired vision follow light: The hockey stadium will probably be approached less by people with vision impairments than other buildings. Incorporate in light scheme. a clear lighting scheme will guide ways and show The lighting will still guide to entrances and playing fields.

#### Murellenschlucht:

Road access for bikes from the Boulevard already connects the area with the Murellenschlucht. The forest area was under Military Occupancy and is now open to the public and shall be used as leisure time area. A bike path shall connect the stage to the residential areas in the north and at the same time add to the leisure time development. The pathways have to be laid out new, guaranteeing a less steep way, parallel with the valley to allow the use of way for handicapped people. The new ways shall connect to the Waldbühne as well as the main axis and become a fixed part of the infrastructure. New pathways nevertheless shall be made with care as this is protected natural land.

### Waldbühne:

The Waldbühne is one of Germany's most spectacular open air theatres: set right into the forest, the fact, that the topography of the Murellenschlucht is used to create the theatre setting. The existing facilities are not sufficient, but the theatre itself is actually well connected through existing pathways. These ways are at the time only used for leisure time use (walking, skating, cycling, etc.). These pathways will be used to give access for trucks and cars for the artists and people that work on site. Therefore the access from the West, coming down the main street shall be used. This way, access can be given without disturbing the residents of Ruhrleben.

The main entrance is part of the existing Nazi architecture. A second entrance shall be constructed further towards the west for two reasons. It shall balance the existence and dominance of the old gate; not denying the past, but set a new symbol. Furthermore the entrance area of the stage shall be redesigned, giving all visitors the possibility to participate commercial activities and breaking up the stream of visitors at the end of the show.

The services will be located along the new entrance way. At the ends of the rows a new platform with catering will serve people at the lower rows. A pedestrian cable car will be installed along the Western stairs along the seats to enable disabled people to reach good quality seating further down and within different distance to the centre line of the stage.

### Pichelberg Station:

The station is set roughly 10m under the Pichelberg platform. This depth shall be kept to avoid noise disturbances for the residential areas as well as for the visitors of the competition site. For the competition the station shall be demolished and moved. It is redesigned to be located attached to the bridge leading the Glockenturmstrasse onto the site.

The platforms will be equipped with two sets of stair/elevator each, with the elevator being set right onto the platform (not at the end, like in the existing station), but set back enough to allow for a good platform diameter in front of the elevator doors to move and turn, also with a wheelchair. The elevator is designed to open on one side on platform level and the other side on ground level, as, using this method, users will not have to turn around, but can "walk through" the lift.

The axis of access is leading right onto the station. At this end it became as wide as a piazza, giving enough space for concert visitors to stay, move, talk, purchase some food, etc..

### Underground Parking

Parking now is spread out all around the site. Unfortunately also in a rather random manner, destroying precious green fields in the area. In the competition, the parking shall be put underground. This way, space can be freed for building or green surfaces. The site will be dominated by pedestrians, skaters or cyclists, adding to the sustainable spirit of the project. The parking can be reached through the elevators of the platform as well as through a second entrance towards the Waldbühne. The idea to combine the entrance of the parking space and the S-Bahn station was to create a centre of mobility on site. Car drivers are encouraged to leave the car and use the station as a Park and Ride station, dropping the car and going to the centre by S-Bahn. On the other side, access will be quick and safety services (lights, cameras, etc. ) and be combined efficiently.

The roof of the platforms will be combined extending the area of the site onto the tracks. This new floor will extend towards the bridge, bringing access closer to the pedestrians from the area. Bicycle stand and the bicycle rent will be allocated there to be as close as possible to the station.

### Sports Hotel:

The hotel will be equipped with a good amount of rooms, appropriate for disabled people. The layout will be rather square (in comparison with the standard rooms) to allow wheelchairs to turn easier and at the same time allow for people with lacks in fine motor skills to move around freely, not having to use small inner corridors.

Some of the standard rooms nevertheless will be longer and rather narrow. They will be extended outwards to create a more playful facade scheme.

The area of the ground floor plan will be wider than the following floors. With retained upper floors the hotel will appear smaller, and add to the atmosphere of "lightness" on site. The visible roof of the ground floor shall be green roof, in that way, that hotel will integrate more to the green surrounding, when seen from the Glockenturm. Only the high guest room part will be clearly seen. Using this system the hotel will appear smaller, than it is, also when seen from the top. The same principles shall be used for the Tennis and Equestrian Centre.

The corridors of the hotel will have little niches with windows. The natural diffuse light will help to make the complex visually more accessible. Furthermore windows and little gathering spaces shall be added at the end of the corridors. That way the pathways are friendlier and quick meeting, resting, etc. will be possible on every floor. This is especially interesting as the hotel shall be used for full sports groups. People will want to meet and then go for lunch together, etc. those pleasurable spaces at the end of corridors cater for these small gatherings.

The facade of the building is done in corrugated brass with a crinkled surface. it is a facade that is both: attractive to watch and touchy (therefore increasing

sensuality). Elevators and emergency exits are located next to the light shafts, as people are instinctively running towards the light in case of an emergency.

### Spa and Fitness

The Spa and Fitness centre as well as the Restaurant shall be public to all visitors and residents. The seminar rooms will be located in the top floor and will have to be booked through the hotel.

### Services

The small wing in the north tower is the service area. This is the area with the least sunlight and the least pretty view and is therefore the least of a loss for the rooms. The lobby is going through the southern tower to guarantee for a warm welcome on arrival from both sides (usually from the north by car, from the south by foot or S-Bahn)

### Seminar

Then seminar area is located in the top floor. This way great view adds to the prestige of the venue. Furthermore visitors of the seminar are sheltered from areas with heavy visitor traffic. Rooms will have windows towards the north for a diffuse light and better visibility. Corridors will be wide and open to give wheelchair users space to move and talk with others at the same time.

### Tennis Centre and Riding Centre

Both sports centres will be connected through the restaurant / bistro on site. Nevertheless they will have individual entrances and are split up in different building complexes. Both clubs have their club rooms open to a small, quiet indoor court yard. The yard will be separated slightly through the kitchen, but access between both zones will be left. That way, members of both clubs can meet easily, while still having their private sphere.

All entrances will be towards the central axis of access



## Conclusion

This paper demonstrated that ID is more than a set of principles, it is an attitude. Every stakeholder to an architectural project must consider accessibility and embed it into his approach. The set of principles can then be used as a guideline to achieve successful planning, development or design. Despite facing different historical scenarios, ID is suitable for all western European countries. The principles are loose enough, so that they fit in perfectly in any existing historical situation or building regulation set. Furthermore the great advantage of ID is, that it also applies to project of any scale. Representing an attitude rather than fixed and non flexible rules, ID is adaptable to any sort of planning and design situation. ID depends more on the understanding of the needs of disabled people and the innermost function of architecture than the the strict learning of rules. As any method or guidance, ID cannot prevent mistakes to happen, but it can surely minimize the risk of spending effort and money on a project that will afterwards fail in accessibility and consequently in popularity.

The thesis demonstrates the power of the 7 principles of ID, but it also emphasizes on the great support given through modern technology. As with most things in life, a balance between both is to be preferred. There is no use in the non installation of technical aid if possible and otherwise the installation of technical aid and then disregarding the simple principles will almost certainly not lead to a satisfying result.

It is clear now, that the principles of ID are something that everybody involved in a building project should now by heart and use as a guideline when making everyday decisions on design, planning or development. It is a great tool to as well guide the design process as well as looking back and retrospectively check for the functionality of a project concerning accessibility. It is therefore a highly recommended tool.

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## **Annexes**