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Another Perspective on the Built Environment

Confronting Architects' View with the Experience of Persons with Disabilities

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Preface

This thesis is part of the research of the 'Research Department CAAD Design and Building Methodology' from the department ASRO. As my thesis is part of the work to obtain the master degree of Engineering Architecture, with an option in building construction design, the choice for this thesis was rather surprising. Next to technical aspects of a building, I am conscious of the fact that an architect has to pay attention to the human part as well. Therefore, I preferred a thesis in this field of study, to replenish my technical background with a rather social dimension of architecture. After months of working hard, this thesis has finally been finished. This past year has confronted me with a lot of new experiences and opinions, which helped me to grow professionally and personally. For this end, I have to thank many people.

First of all, I would like to thank ir.-arch. Peter-Willem Vermeersch and especially my supervisor Prof. dr. ir.-arch. Ann Heylighen. They were both very helpful by providing me professional help, making critical comments and giving useful advices. Above all, I would like to thank them for their constant encouragements and good ideas, after which I every time found new will-powers to continue and improve my research.

I would like to thank Prof. Teresa Valsassina Heitor as well for the help during my time in Portugal. In a country of which I did not really understand the language, she was a great support for me. I thank ir.-arch. Sarah Flebus for being interested in reading my thesis.

This thesis could not be realized without the enthusiasm of the four consulted persons with an impairment. Thanks to their experiences we were provided with a lot of interesting information and inspiration. I also renders thanks to the persons who brought me in touch with these enthusiastic persons, respectively Ann Heylighen, Teresa Heitor and Martine Willems. During each visit to a museum accompanied by a person with an impairment, I was every time assisted by a person. In chronological order by Fátima Alves, Diana Gabao, Sofie Verjans and Martine Willems. Their help was very important to me.

To complement the experiences of the impaired persons the opinions of the architects were also necessary. I would like to thank João Luís Carrilho da Graça, the architect of the Pavilion of Knowledge, to have found time for an interview with me at his architecture office. To Bert Bultereys of the architecture office of Stéphane Beel I would like to say I really appreciated his trip to Louvain, especially for an interview and a visit to Museum M in my company.

I was also interested in the opinions of employees of the concerned museums. In the Pavilion of Knowlegde, Fátima Alves kindly provided me with a lot of information and often invited me to events which could be interesting for me. Jeannine Vandessel, architecture guide of Museum M, was really helpful by giving me a tour around the Museum site and answering my questions.

Beside it, also a word of thanks to Babs Carpentier, Evelyne Kerkdijk and Stefanie Van Doren for critically proofreading this thesis.

Last but not least, I thank my family because they have enabled me to successfully finish my studies and always have supported me.

Caroline Van Doren

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Samenvatting

Deze thesis heeft de titel 'Een ander perspectief op de gebouwde omgeving – Een confrontatie tussen de kijk van de architect en de ervaringen van gebruikers met een beperking'. In architectuur wordt de relatie met het lichaam vaak vergeten. Indien men er wel rekening mee houdt, wordt dikwijls een zogenaamde standaard gebruiker verondersteld of worden aangereikte ergonomische minimummaten zomaar overgenomen. Zoals de titel 'Een ander perspectief op de gebouwde omgeving' suggereert, analyseren we in deze thesis een gebouw niet zoals architecten het gewend zijn, maar hebben we aandacht voor hoe een specifieke gebruiker de gebouwde omgeving ervaart. We focussen vooral op gebruikers met een (visuele of fysieke) beperking omdat zij kwaliteiten of obstakels van een gebouw kunnen aangeven waarvoor architecten vaak minder aandacht hebben, maar die we wel onbewust ervaren. Een plotse trede middenin een ruimte is een hindernis voor rolstoelgebruikers, maar ook andere personen hebben veel kans om er over te struikelen.

We beginnen het onderzoek met een literatuurstudie. Eerst wordt de lezer gepaste terminologie en modellen aangereikt om met de ervaringen van mensen met een beperking om te gaan. In dit hoofdstuk wordt er ook aangetoond dat er bij de ervaring van een omgeving niet enkel aandacht wordt geschonken aan de visuele perceptie, zoals men wel vaak denkt, maar dat een ruimte in feite wordt ervaren door alle zintuigen. Hierbij worden ook voorbeelden gegeven van hoe mensen met een fysieke of visuele beperking de gebouwde omgeving ervaren aan de hand van de zintuigen. Door deze voorbeelden wordt de lezer vertrouwd met dergelijke ervaringen.

Het belangrijkste deel van de thesis zijn de twee case studies zelf. In Lissabon wordt het Pavilion of Knowledge, een wetenschapsmuseum met verschillende activiteiten gericht op kinderen tussen 9 en 14 jaar, onderzocht. In Leuven analyseren we Museum M, een museum voor oude en hedendaagse kunst. Deze gebouwen bezoeken we telkens samen met iemand met een fysieke beperking en een persoon met een visuele beperking. Ook de architect en een medewerker van het museum worden naar hun mening gevraagd. Door middel van publicaties verkrijgen we nog meer informative, zowel objectief als subjectief, over de twee musea. Vertrekkend vanuit de intenties van het concept van de architect vergelijken we hun ervaringen en meningen. Op deze manier wordt duidelijk in welke mate de bedoelingen van de architect ook zo ervaren worden door de bezoekers.

In het vierde hoofdstuk van deze thesis maken we een overkoepelende vergelijking van alle voorbeelden, zowel uit de literatuur als onze twee eigen case studies. We benaderen deze vergelijking met aandacht voor de zintuiglijke ervaringen. Op deze manier kunnen we zien dat er veel overeenkomsten zijn tussen de bestaande case studies die we hebben geraadpleegd en de case studies die we zelf uitgewerkt hebben. Architectuur wordt niet enkel gezien, maar

wordt ervaren door alle zintuigen. Door de voorbeelden te vergelijken, is het ook duidelijk geworden dat het woord esthetiek een bredere betekenis krijgt. Zintuigen worden soms uitgeschakeld of versterkt door de natuur, bv. blind zijn schakelt het zintuig 'Zien' uit. Door de museuminrichting en –handhaving kunnen de ervaringen van zintuigen eveneens bewust of onbewust uitgeschakeld of benadrukt worden.

In het laatste hoofdstuk worden de bevindingen uit de voorgaande hoofdstukken samengevat. We tonen aan hoe expliciet stilstaan bij de ervaring van de gebouwde omgeving tot interessante inzichten kan leiden. Architectuur kan bijdragen tot een bepaalde ervaring, niet enkel een visueel effect. De architect kan een bepaald doel voor ogen hebben, maar dit komt niet altijd zo over bij de gebruiker (met een beperking). Aandacht hebben voor de ervaringen van mensen met een beperking biedt een andere kijk op een gebouw, waarvan we veel van kunnen leren.

Abstract

This thesis is titled 'Another Perspective on the Built Environment – Confronting Architects' View with the Experience of Persons with Disabilities'. Often, the relationship with the human body is not considered in architecture. In case architects do take the body into account, they often suppose a 'standard' user or they take the published ergonomic minimum sizes for granted. As the title 'Another Perspective on the Built Environment' suggests, we analyse buildings in a way less common in architecture, but we pay attention to the way a specific user experiences the built environment. We especially focus on users with a (visual or physical) impairment because they are able to detect obstacles and qualities of a building. Usually these aspects escape notice from architects, but we unconsciously do experience them. An unexpected step in the middle of a room is a barrier for wheelchair users, but other persons as well run the risk of stumbling over.

We start off the research with a literature study. First, the reader is provided with appropriate terminology and models to handle the experiences of persons with an impairment. Persons often are of the opinion that an experience of an environment is only influenced by the visual perception. In fact, a space is experienced by all the senses. In this chapter, we also mention examples of the way persons with a physical or a visual impairment experience the built environment by their senses. By going through these examples, the reader can become familiar with experiences of this kind.

The two case studies are the major parts of this thesis. In Lisbon, the Pavilion of Knowledge, a science museum with different activities directed to children between 9 and 14 years old, is investigated. In Louvain, we analyse Museum M, a museum of ancient and contemporary works of art. These buildings are each visited in the company of a person with a physical impairment and a person with a visual impairment. The architect and an employee of the museum are sounded out as well. By means of publications, we obtain more information, both objective and subjective, about these two museums. Starting from the objectives of the architect, we compare their experiences and opinions. In this way, it becomes clear to what extent the intentions of the architect are experienced by the visitors of the museums.

In the fourth chapter of this thesis, we make an umbrella comparison between all the examples, both from the literature and from our two case studies. We approach this comparison by paying attention to the sensory experiences. In this way we notice that there are many similarities between the consulted case studies of the literature and the case studies which we have done ourselves. Architecture is not only seen, but it can be experienced by all the senses. By comparing these examples, it is clear that the word aesthetics gets a broader meaning. Senses can be disconnected or reinforced by nature, *e.g.* being blind means an

elimination of the sense 'seeing'. The experiences of senses can be consciously or unconsciously eliminated or emphasized by the museum design and management.

The last chapter is a summary of all the conclusions of the previous chapters. We demonstrate that explicitly dwelling on the experience of the built environment can cause to interesting insights. Architecture can contribute to a certain experience, it is not only limited to a visual effect. The architect can have specific intentions in mind, but the user (with an impairment) sometimes does not experiences these purposes. Paying attention to the experiences of persons with an impairment provides an interesting view of a building.

List of Figures and Tables

In case of no reference mentioned, it is a picture made ourselves (*e.g.* picture by Caroline Van Doren). For all other figures and tables a reference is provided.

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Chapter 1: Introduction

In this chapter we consider the relationship between architecture and the human body in history and in present. From this relation we derive and formulate the problem which we will address in this thesis. Afterwards the objectives and the applied methodology of this thesis are presented.

1.1 Architecture and the Human Body

The classical idea of harmony often is considered as a source of architectural beauty (Van Herck & De Cauter 2004). Scale, size and proportion can be seen as aesthetical categories which are directly or indirectly related to the body. Some persons claim beauty comes into being by projecting the proportions of the human body to architecture. The idea of human proportions dates from ancient times.

A modular grid was already used by painters of Ancient Egypt (Pheasant 1988). They employed a grid of 14 equal parts for their drawings of human beings. In Classical Antiquity the human proportions became more meaningful. Harmony was reached when a pleasant relationship existed between the dimension of the whole body and the different parts of the body. The argument for harmony was made by analogy with music. The ancient Greeks found out that a relationship between mathematical proportions in the visual world and consonance in the audible world existed (Rasmussen 1962b).

The most famous creator of a system of the human proportions is Vitruvius (Pheasant 1988). In his opinion, beauty of architecture is a reflection of the beauty of the human body (Van Herck & De Cauter 2004). Harmony is constituted when the different parts of a building are in proportion like the different parts of a human body are in proportion. The distinction between the Roman orders can be understood in this context. Figure 1 shows that the Doric order is related to the male body, Figure 2 relates the Ionic order to the female body and the Corintic order is related to the body of a young girl.

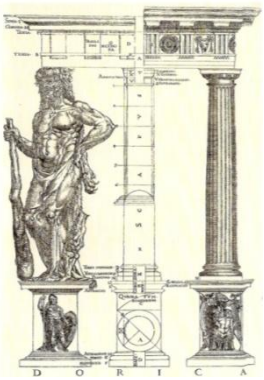

Figure 1 Doric column order with Herculean Atlas

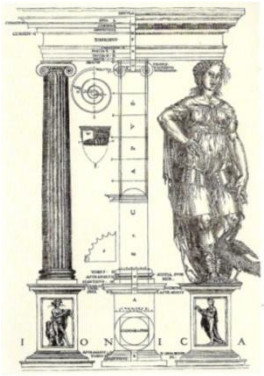

Figure 2 Ionian column order with caryatid

The man described by Vitruvius in ancient times was reinterpreted by Leonardo da Vinci during the Renaissance. His Vitruvian man, a male person within a square and a circle, is one of the most famous images in the Western world (Pheasant 1988). In Da Vinci's theory the golden section was introduced: the ratio of the larger part to the smaller part is equal to the ratio of the whole to the larger part. By applying this famous diagram scale, size and proportion were directly linked to the human body.

During the 18th and 19th century a shift took place from Humanism to Modernism (Van Herck & De Cauter 2004). Although technical principles started to replace the concepts of harmony and proportion, there were still some architects in the 20th century adherent of the traditional notion of Vitruvius.

This classical tradition continued in the work of the modern architect Le Corbusier (Pheasant 1988). He introduced the concept of Le Modulor. In this theory he relates mathematical systems like the golden section to the dimensions of the human body (Van Herck & De Cauter 2004). In the opinion of Le Corbusier, Le Modulor is an universal instrument that should be applied to reach beauty and rationality in everything produced by men (Rasmussen 1962b). By doing so, the human scale can be found in architecture.

Nowadays architects still relate, probably even unconsciously, the perfect male body to architecture. By using books as the 'Metric Handbook' (Adler 1999) or Neufert and Neufert's (2000) 'Architects' Data', designers introduce alleged ideal measurements to architecture (Imrie 2001). These dimensions are related to a standard man, but we do not challenge them. The human body is only applied to derive dimensions of architecture while the use of a building by all kind of people is not considered explicitly.

All human users are supposed to be the same. Like Valerie Fletcher mentions "*the old design standards were based on a six-foot-tall, 20-year-old male, with perfect vision and a good grip*". Architects usually consider the notion of a standard man as invariable and normal. In architecture little if any attention is paid to differences in race, gender, height, ability or any other difference between persons (Imrie 2001).

1.2 Formulation of the Problem and Objectives

From ancient times onwards, persons have been trying to derive proportions and dimensions from the human body. Instead of relating the body to architecture in a mathematical way, we want to establish a new relationship between architecture and the body. We want to establish a new connection. We want to demonstrate that the whole body is more involved in the experience of the built environment than we usually presume.

For examining the experience of persons of the built environment, we will focus on persons with an impairment. These persons generally pay more attention to other sensory experiences than able-bodied persons do. Persons with an impairment are able to detect obstacles and to appreciate qualities to which architects usually do not pay attention (Froyen, Herssens & Heylighen 2008). Therefore, Ostroff (1997) devised the term 'user/expert'. "*A user/expert can be anyone who has developed natural experience in dealing with challenges of our built environment. User/experts include parents managing with toddlers, older people with changing vision or stamina, people of short stature, limited grasp or who use wheelchairs. These diverse people have developed strategies for coping with the barriers and hazards they encounter everyday"* (Ostroff 1997).

As it is not possible to consider the whole diverse community of user/experts, we will limit our area of analysis to persons who are physically or visually impaired. The research question of this thesis is the following: How do people with an impairment experience architecture? And how does this experience relate to the experience intended by the designer?

The purpose of this thesis is to confront the experiences of user/experts with the intentions of the architects. We will examine how the concept conceived by the architect is experienced by persons with an impairment. Are the intentions of the architect communicated to the (impaired) visitors?

Pallasmaa (2006) presumes that every experience of architecture - *i.e.* the built environment – by persons is multi-sensory; "*qualities of space, matter and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle*". This multi-sensory experience is in contrast with the strong emphasis of the visual aspects by architects. Imrie (2003) mentions the following: "*architects do think in terms of buildings rather than in terms of people, I mean that's what they're creating, they are creating aesthetic objects*". In this thesis we will illustrate that the experience of architecture is multi-sensory.

1.4 Methodology

The methodology of this thesis incorporates three different phases.

The research starts with a review of the published materials. The literature study focuses on the relationship between architecture and disability. Initially, we will explain some models and vocabulary about disabilities. This part is essential for the understanding of the case studies. Second, the literature study integrates examples of multi-sensory experiences of the built environment. We will especially focus on experiences of persons with an impairment. The examples will be mentioned under a classification of senses, specifically for architecture. These case studies are of vital importance for getting familiar with the matter and for the further interpretation of the two case studies of the thesis.

In a second phase we will concentrate on the two case studies of museums. First, we analyse existing literature about these museums and interviews are conducted with the architects of the concerned buildings. This information should help us to find out more about their concepts. A person who works in the museum will be heard as well because s/he is closely related to the (experiences of the) museum. In this second phase, we also visit the involved museums accompanied by persons with an impairment to complement the architect's view. For both museums, we consult a physically impaired and a visually impaired user/expert. Later on, we use this information for a comparison between the concept of the architect and the experiences of the user/experts.

In third phase, we confront the experiences from the literature study on the one hand and the experiences of the two case studies on the other hand. The confrontation will be established by making use of the classification of the senses, which is introduced in the beginning of the research.

This thesis ends with an overall conclusion and suggestions for further research.

Chapter 2:
Architecture and Disabilities

The aim of this thesis is to confront the experiences of the user/experts to the concepts of the architects. We are interested in the experience of the built environment by people with impairments because they are able to appreciate qualities or detect obstacles of which the average architect is not conscious (Froyen, Herssens & Heylighen 2008). The purpose of this chapter is double. The first objective of this chapter is to explain some models and terms about disabilities. This part of the research is essential for the understanding of the case studies. The second objective of the chapter is to provide some examples of experiences of the built environment by persons with an impairment. These examples can be interesting so that the reader can become familiar with the experiences of persons with an impairment. The experiences found in the professional literature can also be used for the further interpretation of the two case studies of this thesis.

2.1 Approaches to Disabilities

2.1.1 Models of Disability

There are various ways the society views disabilities. These ways are defined in four models (Devlieger, Rusch & Pfeiffer 2007). Disability studies often make use of model thinking as pragmatic tools. The models give the possibility to reflect about reality. These models are abstractions of the reality, a pure model could not possibly be found. The model which is applied for a certain period in history is dependent on that period and on the population. All the models have a different focus and try to answer a specific question. In contemporary society all the four models are sometimes considered to be present. Pockets of the religious, the medical, the social and the cultural model can be practised at the same time. Table 1 displays a summary of these four models.

Model Dimensions	Religious Model	Medical Model	Social Model	Cultural Model
Roots	God(s)	Natural World	Social Structure	Human Thought
Localization	Evil force(s)	Individual	Society	Representations
Problem level	Punishment or gift	Measurable defect	Interaction pattern	Identity
Explanation	Cosmology	Natural Sciences	Social Sciences	Humanities
Quality of Life	Marginal, Exceptional	Diminished	Being-in-the-world	Transformational
Approach	Existential ("Why?")	Technical ("How?")	Justice	Critique

Table 1 Models of Disability

The first model mentioned by Patrick Devlieger (2007) is the Religious Model. This model is not so wide-spread as the three other ones but nevertheless important. A person can be punished with a disability, as a logical consequence of an act. Sometimes the disability can be seen as a gift, in this way the disability can raise the quality of a person's life. This model actually tries to answer existential questions like "*Why did this happen to me?*". Since this model is not so famous, it will be not further discussed in this thesis. From now on we will talk about the other three models of disability: Medical, Social and Cultural Model.

The most dominant model in the Western world is the Medical Model (Vermeersch & Heylighen 2010). This model defines the noted defect in the person himself or herself, it seems to be the responsibility of the individual. The impairment is a condition that needs to be cured by using medical aids (Landman *et al.* 2005). Another model to manage disabilities was developed during the 1960's and 1970's by a group of persons with disabilities. This model is called the Social Model (Chapman, Jones & Russell 2007). In contrast to the Medical Model the problem is no longer situated in the person himself or herself but in the barriers of the environment (Landman *et al.* 2005). The Social Model of disability is recognized as an immense step forward in disability studies (Butler & Bowlby 1997).

The Medical and the Social Model co-exist in the last model (Vermeersch & Heylighen 2010). This model is named the Cultural Model and was defined by Patrick Devlieger *et al.* (2007) and McDermott and Varenne (1995). It further develops reflecting on disabilities. Not everybody acknowledges this theory is and it is not yet as famous as the two other Models are. The Cultural model will be explained more in detail because this is the model applied for this research.

Lately numerous definitions of disability came into being and became more professional (Pullin 2009a). Most of the time the distinction between the various words is not very clear and can cause confusion. We do not want to redefine disability and impairment, but it can be interesting to have a look at some of the existing definitions. As the different models exist, also different definitions of

disability exist. The word disability seems to be understood differently in every model. Therefore, in this part we will explain the three models more profoundly and glance through the corresponding vocabulary.

2.1.2 The Medical Model

The Medical Model is the traditional perception of disability which tends to be dominated by a medical discourse (Heylighen *et al.* 2010a). The Medical Model considers the disability as an individual problem (Chapman, Jones & Russell 2007). The disability of the individual is the direct result of a physical or a psychological characteristic of the impaired person (Froyen, Herssens & Heylighen 2008). In this model the impairment is seen as something pathological, rather a condition than an experience of a person (Landman *et al.* 2005). The disabled person is considered as the problem himself, not the society (Chapman, Jones & Russell 2007). This Model focuses on what a person is not able to do, *e.g.* a wheelchair user cannot climb the stairs. In this view, the disability needs to be treated or cured to overcome the disability and to become 'normal' (Landman *et al.* 2005). For the treatment the Medical Model provides technical solutions, for instance glasses in the case of a treatable visual impairment.

In the Medical Model disabilities are defined by means of measurable criteria (Heylighen *et al.* 2010a). This model is best characterized by referring to the International Classification of Impairments, Disabilities and Handicaps created by the World Health Organisation (Chapman, Jones & Russell 2007). This model was originally formulated by Wood and later on the WHO adopted the classification (Safran 1998). This classification makes a distinction between 'impairments', 'disabilities' and 'handicaps'. Table 2 represents the International Classification of the World Health Organisation (WHO 1993).

Category	Definition
Impairments	disturbances in body structures or processes which are present at birth or result from later injury or disease
Disabilities	limitations in expected functional activity or as restrictions in activity due to an underlying impairment
Handicaps	difficulties in performing activities of daily living

Table 2 International Classification of Impairments, Disabilities and Handicaps

This well-known classification is usually represented in a simple form (Figure 3).

Figure 3 Scheme 1

According to the book '*Visuele Stoornissen*' (Safran 1998) this classification is often misunderstood. People sometimes interpret the scheme in a linear way: the impairment is a result of the illness, the disability of the impairment and finally the handicap of the disability. This succession is not correct, since the scheme merely represents four aspects, four moments, four levels of experience.

Next to a classification of 'impairment', 'disability' and 'handicap' the Medical Model favours a classification of different kinds of impairments. The group of persons with a disability is very extensive and at the same time very heterogeneous. The publication 'Many Voices Making Choices' about museums in Australia is aware of the diversity of the disabled community (Landman *et al.* 2005). Only for structuring the findings of the report they opted for a clear classification of the disabilities. Four areas of disabilities were formed:
- people with a physical or mobility disability
- people with a sight disability
- people with a hearing disability
- people with an intellectual disability.

Stiker (2007) also mentions a classification on the basis of disabilities. A comparison is made to horses: a certain population is isolated and withdrawn from the whole population like racehorses are isolated and extracted from the whole population of horses. "*Once it has been isolated, it is classified*". In this context it is noted there are "*physically, mentally, and sensory disabled persons*". Under the group 'sensory disabled persons' there are persons with a sight and a hearing disability.

The Medical Model also prefers a clear delimitation of the different kinds of impairments. As we will only treat the experiences of persons with a physical or a visual impairment, we will only provide medical information about these disabilities. The causes and different forms of these disabilities will be briefly illustrated. Of course, more specialized literature exists concerning these impairments but more medical information does not contribute to a better understanding of this research. The information is sufficient to interpret the perspectives of the user/experts consulted for the case studies.

First we will briefly give some medical information about a physical impairment. A physical disability is a mobility impairment. This impairment can have various causes (De Haan 2010) like paralysis (*e.g.* paralysis of the limbs), disturbances of the cooperation of the muscles (*e.g.* trembling), limbs which are lacking (*e.g.* amputation), deformation of bones or joints or a muscular disease (*e.g.* multiple sclerosis). These causes can be congenital, the result of an illness, the effect of an accident or, as the population is ageing, often the result of age.

For a visual impairment we first want to make a distinction between persons who are regarded as blind and persons who have bad eyesight (Dewitte, Jacobs & Mellaerts 2009). Persons who are long-sighted or short-sighted are not considered as having a visual impairment if their sight can be corrected by glasses or lenses. The terms blind and visually impaired do include the optical correction.

Someone is considered as 'blind' if
- his or her visual acuity of the both eyes is less than or equal to 1/10;
- his or her range of vision is smaller than or equal to 20 degrees.

Someone is considered as 'visually impaired' if
- his or her visual acuity of the both eyes is less than or equal to 3/10;
- his or her range of vision is smaller than or equal to 40 degrees.

A visual impairment is actually a combination of various symptoms like the reduction of visual acuity or range of vision mentioned in the previous definitions (Safran 1998).

In what follows, we will enumerate the most important parameters and we will give an explanation of these parameters.

The first symptom mentioned is the reduction of visual acuity. It is the degree of accurately seeing small details (Dewitte, Jacobs & Mellaerts 2009). The fraction of 1/10 means that a person with this visual acuity can notice an object from 1m distance while a sighted person can notice the same object from 10 m distance.
The next one is the range of vision. It is the view you have of the environment when you look right in front of you. A sighted person has a range of vision of 180 degrees. Some people have disturbances of the central range of vision, which means they can only see what is right in front of them. Other persons have problems with the marginal range of vision. They are still able to orientate themselves in a space, but they cannot notice details of things in front of them. Some people are not able to perceive particular colours (mainly the distinction between red and green is unperceivable) and in extreme cases any colour at all. Night blindness is also a symptom of a visual impairment (Safran 1998). Persons who have problems to see at night because of the darkness often do not have any problems to see during daytime. These people prefer a lot of light. On the other side there are also people who have troubles with diffused light, for instance on a cloudy day. A last symptom we want to mention are problems with visual contrasts. They are often underestimated but are also an important cause of a sight disability.

Most people with disabilities do not agree with this Model. They believe the Medical Model has led to a low self esteem, undeveloped life skills, poor education and relatively high unemployment rates (Chapman, Jones & Russell 2007). Persons with disabilities consider the Medical Model as the reason for the breaking of essential relationships with their families, communities and the whole society.

2.1.3 The Social Model

Contrary to the Medical Model, the Social Model no longer considers the disability as an individual disorder but as a social issue (Chapman, Jones & Russell 2007). The body is placed in a socio-material context because of the interaction between an individual and the context of his/her actions (Butler & Bowlby 1997). This context can be social - caused by policies, practices and attitudes - and/or physical (Chapman, Jones & Russell 2007). The maladjustment of the environment can cause barriers for an individual (Landman *et al.* 2005). For instance, people with a physical disability sometimes have problems to enter a building because of the presence of a threshold and the absence of an accessible ramp. In this case the reason of the inaccessibility is the building design and not the person's physical impairment. The Social model focuses on removing barriers in society, rather than on curing or treating people with disabilities like the Medical Model (Landman *et al.* 2005). According to the Social Model, the limitations are the inability of the society to provide equality of opportunity to all citizens (Ambrose 2001).

The connection to the environment is also made in the definitions of the International Classification of Functioning, Disability and Health established by the World Health Organisation (WHO 2001). This classification presumes disability as an intricate correlation between the characteristics of a person's body and the characteristics of the environment and society in which that person lives. A distinction is made between an 'impairment', an 'activity limitation' and a 'participation restriction'. Table 3 represents the International Classification of Functioning, Disability and Health (WHO 2001).

Category	Definition
Impairment	a problem in a body function or structure
Activity limitation	a difficulty encountered in executing a task
Participation restriction	a problem experienced in involvement in life situations

Table 3 International Classification of Functioning, Disability and Health

In the International Classification of Functioning, Disability and Health (WH0 2001) the contextual factors are taken into account in contrast with the former definitions of the International Classifications of Impairments, Disabilities and Handicaps (WH0 1993) which are consistent with the Medical Model. According to the book 'Visuele *Stoornissen*' the scheme with the vocabulary of Figure 3 needs to be adjusted as there is always a relation between adjacent levels and a connection to the social or physical environment (Safran 1998). Figure 4 displays the new scheme.

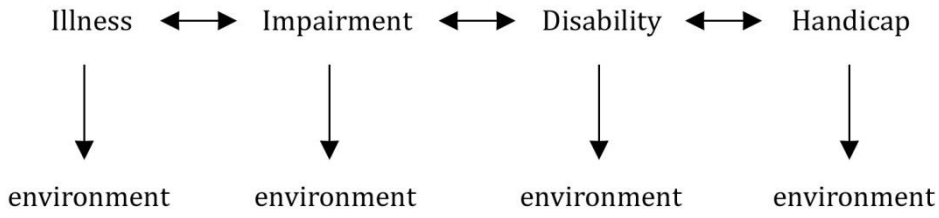

Figure 4 Scheme 2

The physical factors and social contexts make disability contextual, or even dynamic, for every individual (Pullin 2009a). The definitions of the International Classification of Functioning, Disability and Health (WH0 2001) blur the boundaries between disabled and so-called able-bodied persons. Breckenridge and Vogler (2001) state: "*No able-bodied person can be sure that s/he will continue to be able-bodied throughout his/her later years (...) In this sense, no one is ever more than temporarily able-bodied*". A person can become disabled through ageing, war waging or through misfortune. The misfortunes include become disabled during birth, at work or in the course of everyday life. Especially because of the ageing of the population it is quite sure a lot of us will eventually be faced with a kind of disability.

Some of the impairments are clearly distinguishable for the society. A person in a wheelchair obviously has a physical disability, someone who is using a white cane probably is blind or visually impaired. Other disabilities are not so obvious. Deafness is not always directly noticed. A person who is deaf can look like somebody who can hear because s/he is listening carefully by lip-reading but when the person starts to speak you notice his/her voice is a bit different. A person with an intellectual impairment can sometimes react in a strange way, other persons do not notice immediately s/he has this condition. The disabilities mentioned here are all examples of the three areas of disability suggested by Stiker (2007) under the Medical Model.

Next to these three categories other disabilities exist. People cannot notice someone has epilepsy from the first glance. Sometimes you know somebody for years and you are not aware of his/her disability until s/he suddenly has an epileptic outburst. From the first impression you mostly are not informed somebody is suffering asthma. As mentioned in Hidden Disability (Ozer 1990) persons with illnesses that are not immediately apparent are expected to be like everybody else. These are just a few examples of not perceivable disabilities. People can also temporarily suffer an impairment. A broken leg in a plaster is not for life, but during that period one faces obstacles which persons with a physical impairment are daily confronted with.

The disability community is not limited to the persons with disabilities themselves. The person with a disability usually has parents, a partner, children, and friends... Very often these persons are able-bodied people who want to go out together with the person with a disability (Waes & Wagemans 1997).

The use of the phrase 'person with a disability' instead of 'the disabled' or 'the disabled person' reflects the Social Model (Landman *et al.* 2005). The Model puts the individual first, not the disability. Not 'the blind person' but 'the person who is blind' or not 'the autistic person' but 'the person with autism' (Pullin 2009b). In this belief it is important the person is mentioned before the disability, a disability does not 'disable' the whole person.

Whereas the Medical Model is highly criticized by persons with disabilities, the Social Model is appreciated very much. Persons with disabilities believe this Model has given them a feeling of self-worth, a collective identity and a stronger political organisation (Butler & Bowlby 1997). The Social Model is recognized as an immense step forward in disability studies.

2.1.4 The Cultural Model

The Medical and the Social Model are often mentioned in literature. The Medical Model focuses on the impairment and the ways to cure and to treat this disability. The Social Model was a breakthrough because it did not place the cause of disability in the individual but in the relation between a person and his/her environment. The Cultural Model is another Model to understand disabilities. It unites the two previous Models and further develops reflecting on disabilities (Vermeersch & Heylighen 2010). The Social Model situates the problem of disability at the maladjustment of the environment. Because of this emphasis the Social Model sometimes resulted in ignoring the actual pain, the illness, the fatigue and the physical limitations which several persons with disabilities face (Butler & Bowlby 1997). The Cultural Model recognizes the disability in a medical way and also pays attention to the material solution of the Medical Model (*e.g.* wheelchair, white cane,..). These too are part of the experience of a person with an impairment. According to the Cultural Model, the emphasis on the social and physical environment should not give rise to avoid the physical reality of the individual's body. This theory is not acknowledged by everybody and is not yet as famous as the two other Models. In this paragraph we will further explain this relatively new Model and quote the adherents of the Cultural Model.

McDermott and Varenne (1995) claim that "*approaches using each term – culture and disability – differ along a continuum of assumptions about the world, its people and the way they learn*". They discerned three approaches depending on how much of the world they take in consideration: the deprivation approach, the difference approach and the culture as disability approach. The first approach – the deprivation approach – deals with a fixed set of tasks and records of the performances across persons and cultures. People of various groups develop differently but still they are compared to the same set of tasks. Low scores of groups are interpreted as life skills these groups have not yet developed. A simplified version of this approach could be : "*We have culture, and you don't*". The second approach is called the difference approach. For this approach they admit the possibility of developing differently is in

relation to their culture. If we will talk about a wide range of tasks, it is acceptable that one group of persons achieve competence on one set of tasks while another group is able to perform another set of tasks. The easy version of this approach could be: "*We have culture, and you have a different one*." The last approach is the culture as disability approach. This one admits "*there is a possibility that every culture, as a historically evolved pattern of institutions, teaches people what to aspire to and hope for*". The crude version of this approach would be: "*It takes a whole culture of people producing idealizations of what everyone should be and a system of measures for identifying those who fall short for us to forget that we collectively produce our disabilities and the discomforts that conventionally accompany them*". A comparison is made to "*without a money system, there is no debt ; without schools, no learning disabilities;…*" This approach tells us that culture creates problems for the population and expects us to find a solution. McDermott and Varenne assume that disabilities are culturally constructed concepts which can possibly develop into a critique on the same culture (Vermeersch & Heylighen 2010).

Devlieger, Rusch and Pfeiffer (2003) follow the same course of connecting culture and disability. They proposed a Cultural Model of disability. This model has two new challenges of theorizing disabilities. The first challenge of the Cultural Model is recognizing the potential of each of the two Models and admitting where they are localized, *i.e.* the Medical Model in the individual and the Social Model in the society. The Cultural Model should attempt to integrate these two models in one Cultural Model. The second challenge is constructing a disability critique, *i.e.* a method of analysis which involves a continuous deconstruction, addition, reconstruction and creation of information. In this way the Cultural Model acknowledges both the Medical and the Social Model but moves a step beyond by emphasizing the unrevealed potential of disabilities to question usual practices and frames of reference of society (Heylighen *et al.* 2010a). Two appropriate examples present themselves. The first one is about a visual impairment. "*Being visually impaired is characterized in terms of what is won, rather than what is lost and on a critique of the world"* (Devlieger & Froyen 2006). The second example is about the other focus of this thesis, a physical impairment. *"The difficulties people in wheelchairs face with curbs and stairs tell us little about the physical conditions (..) but a great deal about the rigid institutionalization of particular ways of handling gravity and boundaries between street and sidewalk as different zones of interaction*" (McDermott & Varenne 1995). Disabilities call the existing categories in question, this questioning can evolve into new opinions and inspirations (Vermeersch & Heylighen 2010).

Recently the growing awareness that people with disabilities can point out qualities and obstacles of a building came into being (Froyen, Herssens & Heylighen 2008) and is still growing. Parents who push the baby pram discover spaces of a shopping centre which are difficult to reach, culture minded people with a hearing disability pay attention to disturbing noises of the environment, clients with a sight disability indicate information which is difficult to read, nervous travellers have troubles of way finding, elderly persons perceive obstacles in public transport and young children with sensitive airways notice spaces which are poorly ventilated. These examples are perfect illustrations of the purpose of the Cultural Model of disability.

The consulted persons (user/experts) mentioned in this thesis will be considered by us as 'persons with an impairment'. We try to avoid the word 'handicap'. Originally 'handicap' was a term used in sports to measure a difference between players but nowadays it has a more negative connotation (Stiker 2007). The term 'dis-ability' exactly reflects what we want to say: not being able. The word 'disability' is an exclusive English term. In other languages (like our own mother tongue Dutch) this word does not exist. The word 'disability' focuses too much on what a person is not able to do, the word 'impairment' defines a person as able but with a limit. As we want to stress the positive aspects of user/experts we will opt for the word 'impairment'.

In line with the Cultural Model this thesis wants to establish the potential of the experience of persons with impairments (*e.g.* a physical or a sight impairment) in the context of public building design by architects. By conducting interviews for the two case studies of this research we will try to question the concepts and observe their perspectives on the built environment. This could reveal unnoticed aspects of a building. Devlieger and Froyen (2006) define being visually impaired as follows: "*emphasized in terms of what is won, rather than what is lost and on a critique to the world*". According to this quote the Cultural Model and furthermore this thesis does not focus on what persons with an impairment have lost, but on the fact we can learn from their experiences.

2.2 Experience of the Built Environment

2.2.1 A Multi-Sensory Experience

"*A memory of approaching a small church in an Italian hill town:*
*First came the **feeling** of a slight ache in the knees, an ache that told me I had climbed to an elevation. Then the entry into the building, the sudden drop in temperature, the increase in humidity. The hushed yet reverberant **sound**. The dim light, after the glare of the piazza, slowly growing brighter as my pupils dilated. The **sound** of a motorcycle starting up outside, reinforcing my **sense** that I was inside. The **smell** of candles and of old stone and mortar. Walking forward, and **feeling** the unevenness of a floor whose surface had been sculpted for centuries by other feet, a surface placed, thus, in time. Finally, of course, the way the space configured and reconfigured as I moved through it, the kinetic **sense** that is probably the most essential quality of architecture*."
(Campbell 2007)

We usually think we perceive space only through our organ of sight (Vermeersch & Heylighen 2010). In the Western world, sight has been historically seen as the sublime sense of all the senses (Pallasmaa 2006). Already in the Greek Antiquity vision and visibility were strongly emphasized. Heraclitus wrote in one of his fragments "*The eyes are more exact witnesses than the ears*". Aristotle confirms this fact by phrases like "*Of all the senses, trust only the sense of sight*" (Malik 2006). During the Renaissance, the senses were interpreted as a hierarchical system (Pallasmaa 2006). The highest of the five senses was vision, the lowest touch. This Renaissance system was related to the cosmic body: vision was connected to fire and light, hearing to air, smell to vapour, taste to water and touch to earth. Due to the invention of the perspective the eye became the centre of attention. The book 'Modernity and the Hegemony of Vision' summarizes the focus on the eye: "*beginning with the ancient Greeks, Western culture has been dominated by an ocularcentric paradigm, a vision-generated, vision-centred interpretation of knowledge, truth and reality*".

Although the Western culture is characterized by the ocularcentric tradition there always have been opponents of the strong emphasis on the eye (Pallasmaa 2006). Although René Descartes considered vision as the most noble of the senses, he also compared vision to touch. He regarded touch as the sense which is "*more certain and less vulnerable to error than vision*". Friedrich Nietzsche tried to overcome the hegemony of the ocular culture and accused some philosophers of a "*treacherous and blind hostility towards the senses*". Although the eye is underlined in the Western tradition, visual perception often is affirmed by touch (Figure 5). Pallasmaa (2006) himself puts strong emphasis on the sense of touch. He thinks the eyes want to cooperate with all the senses. In his opinion all the senses are extensions of the tactile sense. For example, he relates vision to touch as follows: "*vision reveals what the touch already knows*".

Figure 5 Caravaggio, the Incredulity of Saint Thomas

Our contemporary technological culture probably separated the senses even more (Pallasmaa 2006). Figure 6 gives an example of a city of sensory engagement, on the other hand Figure 7 is an illustration of a city of sensory deprivation. The recent technologies have strengthened the authority of vision. However, they can also help to establish a new balance between all the senses. In a video clip we are not able to analyse every single image, we have to accept the flow of images and we have to value the video clip as an intensified experience. The anthropologist Ashley Montago thinks we are rediscovering our ignored senses as a response to the sensory deprivation we have suffered in the technological culture.

Figure 6 The Children's Games

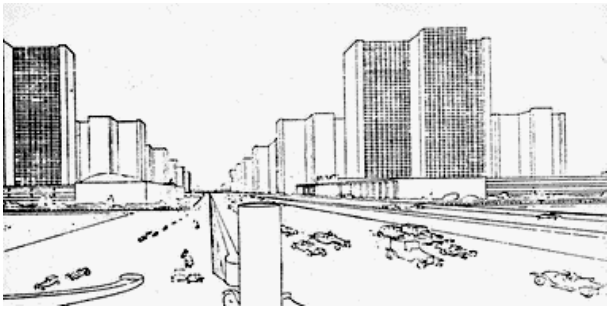

Figure 7 Ville Contemporaine

In reality the experience of the environment seems to be a combination of all the senses - perceiving visible and hidden facets of a space - that makes it possible for us to perceive a whole space (Malik 2006). An experience which makes use of all the senses is called a multi-sensory experience. Pallasmaa (2006) presumes every experience of architecture - *i.e.* the built environment - is multi-sensory; "*qualities of space, matter and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle*". We all know the five senses: sight, smell, touch, taste and sound. Instead of these five classical senses or the vision alone, architecture influences various spheres of sensory experience which are correlated (Pallasmaa 2006). Steven Holl summarizes the experience of architecture as follows: "*The way spaces feel, the sound and the smell of these places, has equal weight to the way thinks look*". The example of the Italian church introducing this chapter illustrates the statement.

2.2.2 The Senses

Hochberg (1972) organizes in the book 'Art, perception and reality' the senses relating to architecture:

- distance senses: seeing and hearing
- skin senses: touch (tactile), smell (olfactory) and thermal comfort
- deep senses: position and motion (kinaesthesia).

The classification of Hochberg is partly in accordance with the theory of Pallasmaa (2006). Sight is the sense of distance and separation (distance senses), whereas the skin is the organ of nearness, intimacy and caresses (skin senses). The classification of senses needs to be exemplified. As we are talking about a multi-sensory experience, the senses cannot be treated apart from each other. Each category of senses picks up interesting information which differs in type and quality (Dischinger 2006). We will supply examples of every group of senses which have been used in buildings to provide a typical experience for every group.

The Distance Senses

The distance senses focus on sight and sound (Malik 2006). Architecture can be seen and heard (Rasmussen 1962d). Architecture does not radiate light and yet it can be perceived. We are able to see the light which architecture reflects, in that way we receive an impressions of forms and materials. Similar to the light effect, sound is reflected by architecture and thereby we gain an impression of forms and materials. Seeing and hearing are two distinct senses even though they are closely related and in some way opposite or complementary. Sight isolates, but sound incorporates (Pallasmaa 2006). Sight is directional, but sound is omni-directional. The sense of sight suggests exteriority, whereas the sense of sound provokes interiority. A person observes an object, whereas sound approaches him/her. The eye reaches, whereas the ear receives.

Two characteristics which are in close relationship with the sense of sight are the phenomena light and colour. Natural daylight cannot be controlled (Rasmussen 1962c). It varies from morning till evening, in intensity and in colour. A window in the centre of a wall is a totally different experience than a room in the corner of a room is. A space can also be lighted from above, an excellent example of this type of illumination is the Pantheon in Rome. Rasmussen (1962c) describes the experience of the Pantheon as follows: "*As you enter the rotunda you are immediately aware of a mild light coming from a source high above you, three times as high as the ceiling of the peristyle. The dome does not seem to limit the space but rather to expand and raise it*". Another important phenomenon of sight is colour. Colour is used to accentuate the character of a building and to emphasize the form and the material. Rasmussen (1962a) points to the firm relationship between material and colour, *i.e.* colour is one of the characteristics of a certain material (for example masonry of a house used to

be red). The colours of a room can change its impression: a small room can look larger because of a soft colour of paint.

Figure 8 Interior of Pantheon

The sound of a space is important as well. In the book 'Art, Perception and Reality' the acoustic effect of a cathedral is mentioned (Hochberg 1972). Sir Basil was of the opinion that the cathedral of Durkheim not only had to look like one but also had to sound like a cathedral. A lot of plasters were tested before he finally found the one which did the cathedral sound like a cathedral. Other examples of the sound of a space are mentioned in 'The eyes of the skin' by Pallasmaa (2006). The sound of church bells makes the citizens aware of their citizenship. The echo of footsteps on a cobbled street creates an interaction between the passenger and the space because of the reverberating sound from the walls in the neighbourhood; the sound measures the space and lets us understand the scale of the street. Inside a tunnel a person can perceive the length and the cylindrical form of it through his/her ears. The sound of seagulls in the harbour provoke a consciousness of the vastness of the sea. These last examples are illustrations of the fact that the boundaries of a space can be perceived through our ears. A stunning aspect of sound noted by Pallasmaa (2006) is the fact that the acoustic perception usually remains as an unconscious background experience.

The Skin Senses

The skin senses give shelter to touch, smell and thermal comfort (Malik 2006). Although sight belongs to the distance senses and touch to the skin senses, Pallasmaa (2006) notes that sight requires the help of touch. If vision would be detached from touch, vision would not have a clue about issues as distance and depth nor of a space or of a body.

Weight, texture, density and temperature of a material are all being read by the skin (Pallasmaa 2006). Water, different kind of floor textures (inside and outside) and a diversity of door handles are examples which make the tactile experience (touch) of a building interesting (Malik 2006). "*It is pleasurable to press a door handle shining*

from the thousands of hands that have entered the door before us; the clean shimmer of ageless wear has turned into an image of welcome and hospitality. The door handle is the handshake of the building" (Pallasmaa 2006). However, the door handle can be polite and appealing (Figure 9), or aggressive and prohibited. Pallasmaa (2006) argues that the flatness of the contemporary constructions is increased by a fading sense of materiality. The traditional natural materials – wood, stone and brick – give rise to a tactile experience and convince us of the authenticity of the matter. These kind of materials are not afraid to show their real age, their origins and the history of human tooling. On the contrary, the manufactured materials – glass, metals and plastics – aspire to perfection and thereby do not communicate any sense of material or age.

Figure 9 Door handle

Pallasmaa (2006) presumes there is a fine transition between tactile and taste experiences. The olfactory sense of an environment is a reason not to place the kitchen next to other important spaces because the smell could permeate the whole building (Malik 2006). The smell of a space often is the characteristic of a space that is always stuck in the memory of a person (Pallasmaa 2006). Persons often are not able to remember the appearance of their grandparents' home but they do remember the scent of the home. This fact is summarized as follows: "*The nose makes the eyes remember*" (Pallasmaa 2006).

The sensations of home, protection and comfort are primary needs of countless generations (Pallasmaa 2006). The thermal comfort of a building is classified very high in surveys of user satisfaction (Malik 2006). Air freshness also belongs to the thermal quality of a building. Alvar Aalto thought a chair, *i.e.* a piece of furniture that comes in a very close contact with a person, should not be composed of materials which are extremely good conductors of heat (Pallasmaa 2006).

The Deep Senses

The last group of the senses are the deep senses (Malik 2006). The escalators of the Pompidou Centre in Paris are an excellent example to illustrate this category. While standing on the escalators you are constantly faced with the varying distant views of Paris and the varying close looks at the building. The architecture of Le Corbusier has a strong preference for the sight (Pallasmaa 2006). His '*promenade architecturale'* puts emphasis on the eye, but on the kinaesthetic eye. Just as in the

Pompidou Centre the works of Le Corbusier favour a succession of different positions.

Figure 10 Villa Savoye

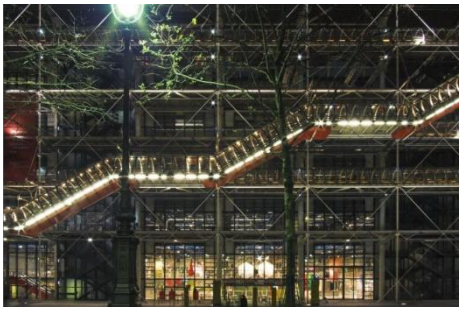

Figure 11 Pompidou Centre

Through the classification of Hochberg it is clear that the senses do not need to be considered in isolation (*e.g.* five different senses) but rather as an amalgamation. Architecture as a total experience including all the senses questions architecture limited to vision (Malik 2006). Our experience of architecture is not only visual, but multi-sensory.

2.2.3 The Experience of Persons with an Impairment

In reality we are all able to experience, comprehend, make use of and find pleasure in a space (Dischinger 2006). This perception also can be attributed to a number of factors. We are capable to move in preferred directions of a space. We are able to hear and discern different sounds produced by our movements while passing over various floor textures. We can recognise and situate human activities because of their sounds produced. We are able to touch textures and shapes or to feel differences in temperature. We can feel the heat of the sun and the breeze of the wind. We can smell the aroma of flowers in the park, or even smell the proximity of an industrial area. Using all of our senses at once is called a multi-sensory experience.

Logically the experience of a space is different when persons have a sensory, physical or mental impairment. As mentioned above each sensory system picks up information which is different in type and quality (Dischinger 2006). According to Merleau-Ponty: "*To see a tree, is not the same as to touch its trunk, hear the sound of its leaves moving, smell it, and be under its shade*" (Dischinger 2006). As we will focus on persons with a physical or a visual impairment we will only mention their experiences and will not examine other undoubtedly interesting perceptions.

As expected the observation of a space is totally different when vision is reduced or absent. No two persons with a visual impairment see exactly the same (Butler & Bowlby 1997). The perception depends on the kind of visual disability[1] but also on

[1] See 'The Medical Model', p.7

the age (congenital or not) when they became blind and how long ago this was (Renders & Viaene 2006). The latter is important for the residue of visual memory and for the person's space concepts based on former visual experiences. People who are not totally blind try to get as much information as possible from their remaining vision. Light conditions, sharp edges, colour contrast, reduction of visual pollution and light reflection are very important for their ability to receive information. People who are classified as blind try to receive more information from their other senses. These other senses like hearing and touch are not really better than the senses of an able-bodied person but they are more aware of the information they provide (Butler & Bowlby 1997). Persons with a physical disability of course pay more attention to the physical qualities of a building. The kind of experience of an environment particularly depends on the fact people are in a wheelchair or not.

As a preparation on the case studies of Museum M and the Pavilion of Knowledge we have read some case studies, focusing on the experience of the built environment by people with physical or visual disabilities.

First, we will give an overview of the case studies to which will be referred. For the case study of the Van Dale College in Louvain (Belgium) (Heylighen *et al.* 2010b) six persons with an impairment and two architecture students are consulted. Of the persons with an impairment, three of them are physically impaired, two of them are visually impaired and one lives with an autism spectrum disorder. In the book of Lieve Blancquaert '*Voorbij de Grens*' (2008) 10 Belgians with an impairment made a journey through the wilderness (Nicaragua). The impairments of these persons are of all kind: a physical, a sensory (visual or hearing) or a mental disability. The other read case studies focus on one kind of impairment, either on a physical impairment or a visual impairment.

Three case studies are consulted which deal with physically impaired persons. The first one is the case of Cheryl Davis (1987) about her home and neighbourhood (The United States). The second case study is called 'Trying Out the Wheelchair' (Winance 2006) and is about the strong relationship between a physically impaired person and his/her wheelchair (France). Another case study, by Ziller and Smith (2005), makes use of photography to interpret the experiences of persons of the built environment of the University of Florida (The United States). One of the interviewed groups of this case study were five students in wheelchairs. The last case study about physical disabilities makes a comparison between the accessibility specifications and the way how they are experienced by wheelchair user/experts (Vredenburgh *et al.*2010). 167 people participated in this study. Among them manual wheelchair users and motorized wheelchairs users, but also persons with vision problems or even no physical limitations at all.

The remaining case studies all focus on the experiences of visually impaired persons. Just as the case study of Ziller and Smith (2005), the paper 'A lens into the haptic world' (Heylighen & Herssens 2009) makes use of a camera. For this research no physically impaired persons were consulted, but children who are congenitally blind. Two other case studies focus on the experiences of a Portuguese architect with a

visual impairment, *i.e.* Carlos Mourão Pereira. Vermeersch and Heylighen (2010) analysed one of his projects, the Sea Bathing Facility in Lourinhã (Portugal). The other paper is written by Carlos Mourão Pereira himself (2010) and talks about potential thresholds of exhibition spaces and proposed solutions. Mellaerts (2007), a visually impaired person, wrote a book '*Leuven Horen en Voelen'*, focusing on his experience of the City of Louvain (Belgium). The case studies that are interesting for us are the following: the *Grote Markt*, the City Hall and the Aula Pieter de Somer. The paper 'Bodies and spaces' (Butler & Bowlby 1997) treats the experiences of visually impaired people of public places in general. The last two case studies deal with visually impaired persons and with blindfolded persons. For the paper 'Buildings Revis(it)ed' (Froyen, Herssens & Heylighen 2008) three public buildings were visited by a group of visually impaired user/experts, architects, architecture critics and students. The visits regarded STUK Arts Centre in Louvain (Belgium), the Concert Hall of Bruges (Belgium) and the Flemish Administrative Centre VAC in Hasselt (Belgium). Malik (2006) deals with two contrasting buildings, *i.e.* the Lotus Temple in Bahahpur (India) and the Crafts Museum in New Delhi (India). She took a blindfolded volunteer and a blind person on the same walk through the two buildings.

These case studies are interesting to become familiar with the study subject. Furthermore, under chapter 4 'Confrontation' we will go back to these case studies to make a comparison. The case studies of the professional literature will be mentioned under the classification of Hochberg (1972). For illustrating each group of senses, we will try to provide typical examples of each sense. However, the senses cannot be treated apart from each other (Dischinger 2006).

The Distance Senses

Seeing

The Van Dale College is criticized by the visually impaired persons for the lack of clear organisation (Heylighen *et al.* 2010b). The person with low vision thinks the complex is not really user-friendly. In his opinion the Van Dale College is not designed as a whole. Inclusive signage is very important for this type of buildings. He thinks the building can be improved with regard to organisation and signage. The person who is blind agrees to this matter, she describes the complex as a true labyrinth.

The location of the reception is important. In the Van Dale College the person who is blind is able to find the reception by herself because the reception is located close to the entrance, which is a logical location for a reception (Heylighen *et al.* 2010b). Also in VAC Hasselt the visitors notice the position of the reception (Froyen, Herssens & Heylighen 2008). It is necessary the reception can be seen directly from the entrance. In this way the visually impaired are guided to the reception because of the architecture. If they would walk in the other direction the staff of the reception would be able to help.

Some elements of the design may be only visual and apparently do not have influence on the other senses (Malik 2006). In the Lotus Temple the user/experts do not notice the water bodies outside the Temple (Malik 2006). Also the transparency of a glass wall and the views it provides, are not enjoyed by visually impaired persons (Froyen, Herssens & Heylighen 2008). Persons who are congenitally blind do not understand the notion of transparency, an aspect which is evident to sighted people (Herssens & Heylighen 2009). In this research a child took a picture of a transparent fish bowl. Because he was not aware of the effect of transparency he put the camera inside the bowl. Grey painted walls or steps without clear edges are very difficult for persons with a visual impairment (Butler & Bowlby 1997).

Figure 12 Fish in a transparent glass bowl

Hearing

Sounds can also help to locate certain rooms and functions inside or outside a building. In the Van Dale College the blind person can locate the reception again because of the sound of the traffic outside (Heylighen *et al.* 2010b). Street human activities (cars moving, people talking,..) are rather loud, some sensory attributes are more discrete (Dischinger 2006). The sound of running water and of moving leaves of a tree are examples of pleasant sounds which contribute to the obtaining of meaning.

A drop in decibel level between the outside and the inside announces the visitors are inside the Lotus Temple (Malik 2006). Mellaerts (2007) notices the same at the City Hall of Louvain. The auditory impact of one of the halls contrasts sharply with the ringing bells, the footsteps, the voices,.. of the *Grote Markt*. Footsteps on the stone floor resound on the wooden ceiling. Because of these sounds the visually impaired visitor can imagine the structure and the materials of the ceiling. In the Lotus Temple one of the visitors imagines the ceiling as a dome (Malik 2006). He gets this correct feeling because of the reflection of the echo.

Sometimes the reverberation can be too much and become really annoying. In the opinion of a blind person this is the case in the Van Dale College (Heylighen *et al.* 2010b). She does not like the atmosphere in the building, one of the reasons is the exaggerated resonance of the complex.

The Skin Senses

Touch

Still related to 'Hearing', visually impaired persons often use a white cane (Dischinger 2006). They touch the ground with the use of this tool and get an idea of the materials and borders. At the same time the ticking of the cane produces a sound which can be guiding. Sometimes the persons with low vision do not really use the white stick but only use it as a symbol for sighted people to prevent hostile reactions (Butler & Bowlby 1997). Persons in a wheelchair obviously do not make use of a cane to touch the floor, they get an impression of the materials of the floor by the wheels of the wheelchair. Sometimes it is very easy to move, sometimes they get stuck because of the floor texture.

The finishing of the materials is also important for persons with a visual impairment. Carlos Mourão Pereira, a person who is visually impaired since 2006, now prefers more ergonomic round shapes instead of sharp edges (Vermeersch & Heylighen 2010). In one of his papers he describes a tactile model of the Marine Exhibition Space whose "edges *and vertices are rounded with a radius similar to the Braille dot standards*" (Pereira 2010). Mellaerts (2007) pays attention to the finishing of stones. He argues every stone has its own hardness, colour, warmth and mode of fabricating. The chisel markings give away the story of the fabricating of the stones. He knows it never occurs to sighted persons to touch a stone, however in his opinion this is the best way to explore the texture of the construction materials.

To discover the whole building Mellaerts (2007) suggests a walk around the complex. During this walk the (visually impaired) person has the opportunity to discover the site and the ground plan. S/he also has the possibility to touch the (materials of the) wall. For walking inside the building Pereira (2010) proposes an orientation handrail which is designed portable and modular. In his opinion this handrail is a tactile and a visual element of the exhibition in the proximity of the displayed objects. During a visit of the STUK Arts Centre in Louvain attention is paid to the handrails (Froyen, Herssens & Heylighen 2008). In the opinion of Koen Van Synghel "*buildings are creatures with limbs which reach out to the individuals, show the persons the way or give the visitors one's arm*". A banister of a flight of stairs which does not start at the first step, is too late to guide the persons.

Figure 13 Outdoor Room for Sculpture Exhibition

In the context of museums, the content of the exhibition often can be touched and has to be considered as well. Sighted persons consider different elements of a building (walls, floors and ceilings) as separate elements (Heylighen *et al.* 2010a). On the other hand, persons who are blind seem to experience a space as a whole, and not as distinct building elements. Moreover, blind persons seem to experience fixed elements (*e.g.* the floor) and movable elements (*e.g.* a table) as a whole. They do not distinguish the furniture from the building. In a museum context, the content of the museum has to be in consideration because it seems to have an influence on its experience.

Smell

In the Van Dale College the person who is blind is able to find the reception on the basis of the smell next to the logical position at the entrance (Heylighen *et al.* 2010b). The smell of the reception reminds her of journals or even a library. In general she did not like the smell of the complex very much, the smell was rather unpleasant. She thinks the smell is due to inadequate ventilation of the building.

The smell of a space can be pleasant too. Mellaerts (2007) notes one of the halls of the City Hall of Louvain has a nice smell because of the abound timberwork. The smell of grass can attribute to the perception of a garden (Dischinger 2006).

Thermal Comfort

A space provides a whole different experience when the space is in direct sunlight or not (Vermeersch & Heylighen 2010). Pereira says the direct presence of the sun offers a different tactile experience of warmth. Dischinger (2006) also points at the presence of the sun as part of the experience. According to the warmth of the sun, also the change in temperature provides another experience of space. In the Lotus Temple the distinct change in temperature level was a characteristic which makes the (visually impaired) visitor conscious of being inside the Temple (Malik 2006). Being inside or not is normally brought to the attention of the visitor by the sense of sight. In the Crafts Museum the writers point out that the variations in temperature are useful for the visitors to describe the scale of the spaces (Malik 2006). The visitors recognized the low height of the structure and the openness of the space.

Dischinger (2006) makes a remark on the presence or absence of wind. She notes the presence of wind can be positive, *e.g.* it can help visually impaired persons to orientate themselves when reaching an open place. On the contrary, wind can also be misleading, *e.g.* it can mask other sounds which could be useful as spatial references. The absence or presence of wind makes a big difference in the experience of the environment. This fact is also noted by Pereira in the case of a simple wall (Vermeersch & Heylighen 2010). Standing in front of the wall means you are completely exposed to the wind. On the contrary, standing behind a wall shelters

you from the wind. Both sides looked exactly the same, although they were experienced completely differently.

The Deep Senses

Position

Persons in a wheelchair are at a lower eye level as standing persons are. In a research with different kind of people who have to present their environment on the basis of a series of photographs, also five physically impaired persons are consulted (Ziller & Smith 2005). The world of persons using a wheelchair seems to be unusually flat, none of the photographs involved a subtended angle. The conclusion of the research is that wheelchair users rarely look up or down. With regard to looking up, it seems to be more difficult to bend back in a sitting position. In such a position it is also more difficult to look down, besides windows are often too high to provide wheelchair users a view. Next to the observation of the flat world of wheelchair users, the researchers noted another observation concerning eye contact. Other persons seem to avoid eye contact with the person in a wheelchair. "*The handicapped person sees bodies without eyes*" (Ziller & Smith 2005).

The study notes the understanding of persons with a disability should improve (Ziller & Smith 2005). The avoidance of eye contact is not the only difficulty persons in wheelchairs face while being in a public space. Another fact is noted in the book 'Rethinking Architecture' by Cheryl Davis (1987). She illustrates the special seats for disabled people during events. One time she was at the Moscow Circus in Boston whose refunds went to the Muscular Dystrophy Association "*to help the handicapped*". During that event she was forced to take a seat at the place for wheelchairs. She was very upset that she was not able to see the circus in the company of her able-bodied friends. Although the organisation had probably foreseen special seats with the best intentions, just as other spectators persons with a physical impairment want to choose their own seats.

The position in a space is also a matter of special importance for persons with a visual impairment. Koen Van Synghel describes it as follows: "*A square or an inner courtyard suddenly is no space anymore but an intangible place, defined by walls, windowsills, stairs, balustrades or a great void*" (Froyen, Herssens & Heylighen 2008). The user/experts of the City of Louvain mention visually impaired persons do not like to enter a public square (Renders & Viaene 2006). A blind person usually does not walk to the middle of the square unless there are routes to follow. A visually impaired person likes to follow a wall or a route on the ground to orientate himself or herself.

However, the squares often are appreciated for the auditory experience (Renders & Viaene 2006). A user/expert of the City of Louvain mentions the following: "*When there is only one point that reflects sounds, it means that you are in an open space*". Mellaerts (2007) visited the *Grote Markt* of Louvain as a user/expert. He especially

noticed the footsteps and the voices of the population. Occasionally also tolling bells, music instruments or sirens resounded at the square. Mellaerts noticed the position of the spectator on the *Grote Markt* is determining for the resonance of and consequently the perception of the sounds.

Motion

One user/expert testifies his world is now smaller than before because of the wheelchair (Winance 2006). This person feels excluded from all places where one has to get by stairs. Another user/expert mentions her parents used to carry her up and down the stairs of the parental home (Davis 1987). The parents never talked about a house where she was able to get in and out herself. When she was 22 years old she left home. Her first house was not ideal but it was the only partially accessible and affordable house she could find. Although this house was not perfect at all, she was happy to be independent of other persons for the first time in her life.

Other persons do not really mind about steps, they try to handle them themselves. Anita is a woman who is confined to a wheelchair since one year and a half (Blancquaert 2008). She confides she does not bother stairs, either on buses, trams or metro. When there is no other solution, she even crawls into the bus. This woman still did not accept her impairment. Probably the denial of her impairment is the reason for her persistence. Most persons with physical disabilities prefer a ramp or an elevator.

Not only physical impaired persons prefer a ramp, also persons with a visual disability appreciate a ramp for moving between different levels. In the Lotus Temple the visually impaired user/expert says he would have preferred a ramp instead of stairs (Malik 2006). He thinks the stairs bring an interruption into the flow of moving. Inside the Crafts Museum the user/expert mentions he feels much more comfortable walking on the ramp than walking up and down the stairs. Small differences in level are rapidly perceived by persons with a visual impairment. Mellaerts (2007) notices the gentle slope of the *Grote Markt* in the direction of the river Dijle.

For moving between levels there is also often the possibility of an elevator. Persons with physical impairments appreciate an elevator inside a building. This makes moving between levels more effortless for them. Persons with visual impairments may prefer the elevator because a flight of stairs is sometimes difficult due to the lack of contrast. The buttons of an elevator are best placed underneath each other because an elevator moves up and down (Froyen, Herssens & Heylighen 2008). This arrangement is more logical for everyone and more easy to understand. However, persons in a wheelchair still have to be able to reach all the buttons. Vredenburgh (2010) also noticed that the preferred measures in the case of wall switches were always higher for cane user/experts as for wheelchair ones.

The entrance of a building often is not totally flat but makes use of a ramp or steps. The user/expert who visited the Lotus Temple and the Crafts Museum concludes that the overall experience of a place is dependent on how persons move through spaces (Malik 2006). He especially emphasized the entrance, because this is the space where the first impression is constituted. At the beginning of the visits he stated: "*the whole experience of a place is strongly influenced by the entrance to it*".

Although the overall experience seems to be influenced by the experience of the entrance, the overall impression of the building can be different. In the Van Dale College the person who is blind has the impression the spaces feel empty (Heylighen *et al.* 2010b). Also in the Craft Museum the user/expert notices the building was very spacious (Malik 2006). He could not imagine objects in the room, although it was a museum. This 'emptiness' noted by the visually impaired persons is really appreciated by the persons with a physical disability. Persons in a wheelchair appreciate the spaciousness very much. This largeness of spaces allows them to move freely through the rooms. The way persons in wheelchairs move through the space is totally different than the way standing persons walk through spaces. Their movement might be compared to the movement of cars, it is very fluent. On the contrary, the movement of walking persons goes step by step.

As the importance of a banister is already mentioned under 'Touch' and 'Position', a banister is also interesting for the way persons move through a building. Christophersen and Denizou (2011) introduced the term 'guidepath'. This term includes architectural circulation elements, lines of traffic flow and features which are especially designed for persons with impairments. They distinct four categories of guidepaths: as architectural feature (*e.g.* the Guggenheim Museum in New York), in floor surfaces (*e.g*. a coloured path), on walls (*e.g.* a handrail along the corridor) or in ceilings (*e.g.* strip lights). By creating a guidepath, persons (with visual impairments) are encouraged to follow the indicated path.

Concluding Thoughts

This chapter has started with an overview of the most important models and terms of disabilities. Next to the Medical Model and the Social Model, the Cultural Model came into being. The latter unites the Medical and the Social model, but also develops reflecting on impairments even further. The Cultural Model is explained extensively because this model has been used for this thesis. The second part of the chapter treated the experience of the built environment as a multi-sensory experience. The classification of the senses by Hochberg (1972) is mentioned in relation to architecture. Special attention is paid to the experience of persons with a physical or a visual impairment because this is useful for the understanding of the case studies in the next chapter.

Chapter 3:
Case Studies

After having explored the literature regarding architecture and disabilities in the context of a multi-sensory experience, we will test this relationship by practical experience. We have selected two buildings for the case studies, one in Portugal – Pavilion of Knowledge and one in Belgium – Museum M. These buildings were specifically chosen for several reasons. They both are well-known museums, attracting a large volume of visitors. The content of these museums is different as the Pavilion of Knowledge is an activity museum and Museum M is an art museum. Another reason for selection of these museums is the fact that both architects paid attention to persons with an impairment during the design process. The first part concerns the Pavilion of Knowledge, the second part has a similar structure but regards Museum M. Each case study starts with a part of general information concerning the location, the concept and the exhibition spaces. We have to mention each museum hosts temporary exhibitions, so the description of the spaces can change in time. This general part is very extensive and treats the museum space per space because the second part is a cross analysis. Through this first part the reader can get familiar to the building and go back to this part if necessary. The second part of each case study integrates the analysis: the architectural concept of the building is compared to the experience of persons with an impairment. Later on, these case studies will be mutually compared.

3.1 Pavilion of Knowledge – Lisbon

3.1.1 General Information

3.1.1.1 Urban Context

Expo ’98

The City of Lisbon had been separated from the river Tagus because of the works in the Port, the construction of railway lines and particularly by the installation of factories on the banks of the river (Ferreira 1996). Lisbon wanted to interlink City-River and City-Port, the idea of ‘Turning the City towards the River’ arose in the public opinion. In 1988 the Portuguese Architects Association constituted the ‘Competition for Ideas for the Riverside Area’.

In December of 1989 Portugal presented its candidature for holding the Expo ’98 in Lisbon (Ferreira *et al.* 1996). In 1991 Lisbon began looking for a location for the Expo ’98. The Portuguese World Fair of 1940 led to huge improvements to the western part of the city. Holding the Expo in the eastern area of the city was thought to be ideal, so that the Expo could function as a catalyst in the regeneration progress of the eastern part. The exhibition could re-establish the centrality, the greatness and the symmetry of the city. In 1992 the B.I.E. (*Bureau International des Expositions*) voted in favour of the Portuguese candidature, so the Expo ’98 would be in Lisbon. This decision was a very important opportunity to complement the idea of turning the city to the river and revalue the eastern part.

Since the decision of Expo ’98 was taken by the B.I.E. several studies (Figure 14) were launched, such as the Competition for Ideas and the Preliminary Urbanisation Study (Ferreira *et al.* 1996). Although many aspects were considered in these studies, the final orientation of the zone was the responsibility of Vassalo Rosa. In 1993 he established the Urbanisation Plan for the Intervention Zone (PUZI). The main objectives of this plan were the following: turning the city towards to the river, using a net-like model, public areas and embodiment of the memory of Expo ’98. In these plans already a few basic decisions were made, such as the project of the Pavilion of the Oceans.

The B.I.E. gave Expo ’98 the name ‘*Exposition Mondiale*’ instead of ‘*Exposition Universelle*’ because of the length of the exhibition and for other reasons (Brumagne 1998). In 1994 the General Assembly of the United Nations decided the declaration of 1998 as the International Year of the Oceans. Expo ’98 became a thematic exhibition focusing on the “*The Oceans. A patrimony for the future*”. At the end of the century it was a good moment to think about the past and about the future with respect to the ocean and its resources (Reis 1998). In this exposition the Portuguese people wanted to honour the Portuguese Vasco da Gama who discovered India 500 years before, in 1498. The theme of the expo refers to Expo ’92 in Seville which was about the discovery of America by Christopher Columbus (Tilman 1998).

The urban design of the Lisbon Exposition was based on four kinds of elements (Toussaint 1999) :
- The Dock and the River Wall, to remember to previous location and function
- Two Ordinate Rectangular Axes, *i.e.* one parallel to the river and one at right angles to the first one constituted by the Orient Station and the water
- Two Paths, one of the water and one of the coast
- Public Area Design and Rules of Composition, based on a module of 7 meters each side.

From this urban design the Pavilions and main areas were created with the intention to cover a whole block each (Toussaint 1999). Some of the Pavilions that were created for the exposition would remain, other ones would disappear after the expo. The five thematic Pavilions of the exposition were: the Pavilion of Portugal, the Pavilion of the Oceans, the Pavilion of the Future, the Utopian Pavilion and the Pavilion of the Knowledge of the Seas. Beside these five main thematic Pavilions the site also offered space for international Pavilions and other buildings.

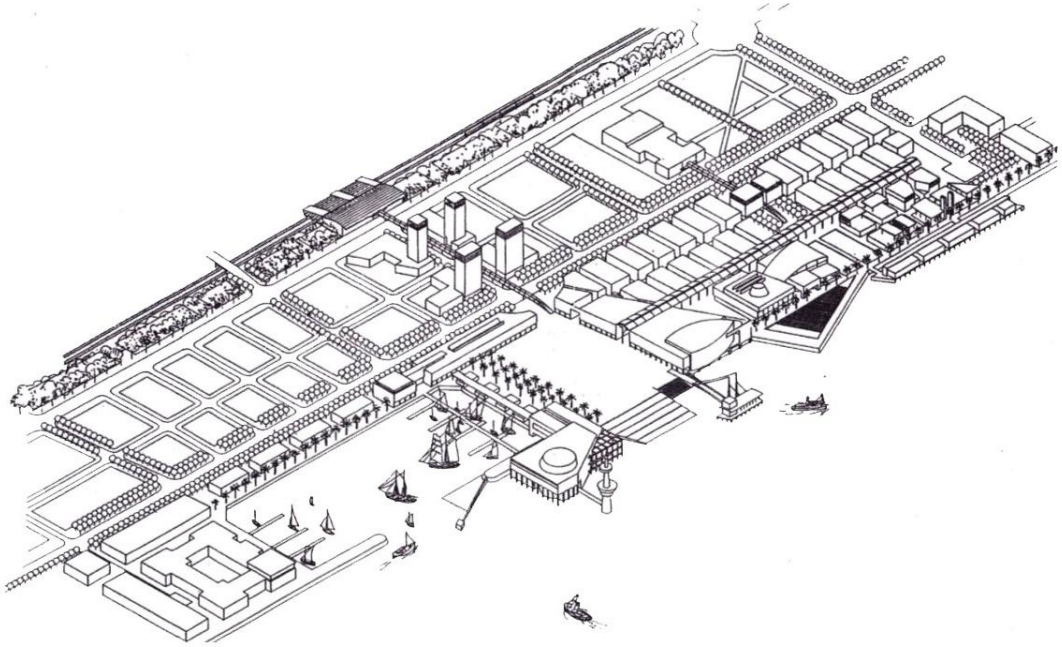

Figure 14 Preliminary Master Plan

Park of the Nations

The Lisbon World Exposition took place from the 21st of May until the 30th of September 1998 (Machado 2006). The intention was to integrate this site into the rest of the city after the exposition. The site of Expo '98 received the new name 'Park of the Nations' to leave behind the great event (Toussaint 1999).

Often, great events require specialized structures (Ferreira *et al.* 1996). Sporting events require buildings for swimming pools, gymnasiums, sport fields,… These structures do not have problems to find a future purpose: a swimming pool remains a swimming pool. The question is more complex for non-specialized events like a world exposition. These kinds of events require new spaces which are appropriate for their purpose and which would be re-used immediately after the exposition.

Seville (Expo 1992) and Barcelona (Olympic Games 1992) are examples of integration of great events. The Olympic Village of Barcelona was also built on a previously polluted zone. The Olympic Games contributed to a modernization of the city. Barcelona already started a modernization plan many years before the Great Event; the Olympics just accelerated its realization. After the end of Expo '92 in Seville it was the intention to realize a science park, but unfortunately this did not work out (Toussaint 1999). Only the foreseen government buildings were executed. To prevent disasters as in Seville it was necessary that the role of the Expo in the contemporary society was considered well in advance.

To avoid integration problems after Expo '98 the site was a part of the Urbanization Plan of the Intervention Zone (PUZI) (Ferreira *et al.* 1996). During the conception of the Pavilions it was already known which ones would be temporary and which ones permanent. The famous Pavilion of Portugal was meant to stay, but its future purpose was not yet known. The Pavilion of the Seas, the Oceanarium, did not have a change of use. The Atlantic Pavilion was foreseen to stage performances and plays. The Pavilion of the Knowledge of the Seas accommodated an exhibition about the Seas during the Expo; afterwards it would become a Museum of Sciences.

The PUZI also imposed that half of the area would be reserved for housing, yet there was one but in the matter: the buyers had to be able to afford the houses and apartments (Toussaint 1999). Offices for business were provided too. The Vasco da Gama shopping centre was an important post-exposition characteristic as well. During the weekend the park is ideal to spend the day together with the family by walking along the avenues, boulevards, gardens, walkways by the river or visiting an interesting Pavilion.

Location and Transport

The Lisbon World Exposition provided a lot of transportation possibilities to enter the Park. In the first place it was important to foresee accessibility of the Park during the Expo '98. But the transportation was also of vital importance for the recovery of the eastern part of Lisbon and for the connection to other important Portuguese cities.

Thanks to the construction of the new Vasco da Gama bridge crossing the Tagus the Exposition site became a strategic location of Lisbon (Tilman 1998). Santiago Calatrava is the designer of the famous Orient Station which became the new main

access of the Expo (Toussaint 1999). The building serves as a train station, a bus and truck terminal and below the underground and a parking are situated. It is located at the west limit of the zone and at the central axis of the park.

The Pavilion of Knowledge is situated in the Park of the Nations (Figure 15). It is located parallel to the *Alameda dos Oceanos* (the central boulevard) and close to the Oceanarium, the eye-catcher in the middle of the Olivais Dock (Toussaint 1999). The entrance is located at the access patio of the Pavilion, which you can perceive by approaching from the dock or the boulevard.

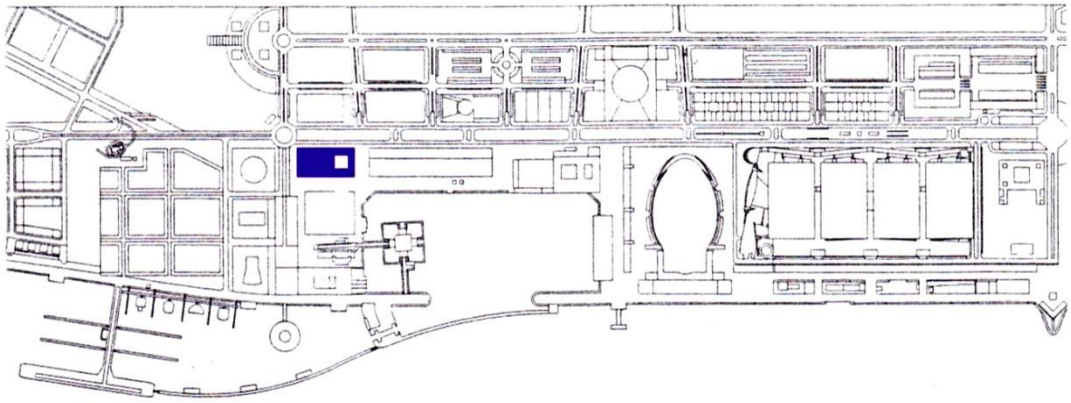

Figure 15 Park of the Nations

At first, car traffic was prohibited in the park itself, but this is no longer the case. Some people opposed to the decision to allow traffic because it is dangerous for children and it is not so quiet anymore in the park. Other people think it is an improvement because now all the buildings can be accessed more easily (Toussaint 1999). Now there are two traffic lanes, one in each direction. Between the two lanes there is a wide walking path. On each side of the walking path and next to each traffic lane there is a bicycle lane. The width of a bicycle lane is equal to the width of a traffic lane. The distinction between the lanes is made by little piles that are placed relatively far from each other.

One can get to the Pavilion of Knowledge by means of public transport: by train, by bus or by metro in the Orient Station. There are more buses which have a bus stop in front of the Pavilion, which makes it very easy to reach. If you come by car, you can park it in front of the Pavilion or in a subterranean parking of another building. Employees of the building have a parking place underneath the Pavilion of the Knowledge. And of course it is possible to reach the park by bike or on foot.

When you are in the park it is very easy to find the Pavilion by means of the signalization. The signage was developed for the Expo '98 but some of it is still used nowadays (Cadernos de design 1998). In the design of the signs a lot of attention was paid to the readability and recognition standards. This was important because many people of different nationalities came to visit the exposition. Due to these measures for the exposition, the Park of the Nations can still make good use of the signage.

3.1.1.2 Architectural Concept

When João Luís Carrilho da Graça was commissioned to design the Pavilion, the site was still empty. None of the elected architects of the different Pavilions knew at that moment what the other Pavilions would look like (interview architect 2010). Usually when architects conceive a building they try to establish a relationship with the context, the surrounding buildings. In this case it was not yet possible. While the Pavilions were being constructed, Álvora Siza Vieira (the architect of the Portuguese Pavilion) and he found out that their buildings fit very well together.

Fernandes and Cannata (2001) describe the Pavilion as basically consisting of a vertical and horizontal volume which together form a megalithic cross (Figure 16). The horizontal block seems to be in a kind of suspension. In this horizontal mass a square is hollowed out: the access patio.

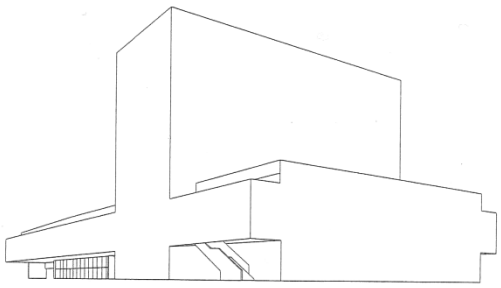

Figure 16 Megalithic Cross

The vertical and horizontal masses are made out of white concrete (Perrault 2000). For the entrance patio white limestone is used as the main material. This stone contains a variety of maritime fossils. The use of this material refers to the theme of the exhibition. For the floor two kinds of finishing are applied. One side of the ramp is rough finish, the other side is smooth finish. Wood can be seen in the ceiling. In the middle of the courtyard there is a fountain. All the applied materials communicate a kind of tranquillity, exactly the effect the architect wants.

Carrilho da Graça finds it very important that when you arrive at this building a moment of silence comes over you (Dias 2005). He visited the Expo of Seville in 1992 and there he noticed something. One by one all the buildings in the Expo want to draw attention. With the Pavilion of Knowledge he did not want to create a glaring building but a building which gives forth a kind of serenity before you enter it (interview architect 2010).

Sometimes a telling comparison is made to the Tower of Belém. This tower always fascinated him because of the metamorphosis of a palace into a ship (João Luís Carrilho da Graça 2005). The monument is placed in the river, in earlier times it was totally surrounded by the water. In this way it makes an allusion to a ship. When the Pavilion was built people noticed that it has similarities to the Tower of Belém.

The entrance consists of a ramp which is dynamically developed around the patio (Figure 17). The horizontal and vertical masses convoke immobility, the ramp on the contrary provides movement and tension (Fernandes & Cannata 2001). For this concept the architect found some inspiration in the Japan's Pavilion of Expo '92 in Seville (Perrault 2000). Before you enter the Pavilion you suddenly get a view over the whole expo area. This movement, accompanied by the whisper of the water, also defines the beginning of the tour.

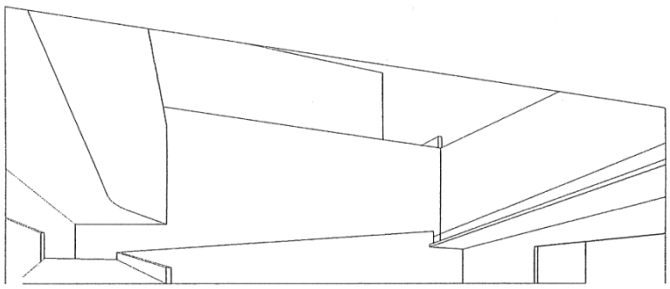

Figure 17 Entrance Ramp

The content of the exhibition is not made by Carrilho da Graça, it was the work or ARX Architects (Reis 1998). He did not know what the content of the exhibition would be during the Expo of 1998, nor did he know exactly what the content of the later museum would be. According to Perrault (2001), Carrilho da Graça for this reason designed the spaces of the building as empty stages. The rooms are white sheets on which exhibitions could be displayed.

Fernandes and Cannata (2001) mention none of the spaces have natural lighting except for the entrance hall. It was a strong demand of the organization of the Expo. In this way artificial lighting can be used to emphasize important objects of the exhibition. Even if there are windows, they need to be shut during the exhibition. When Carrilho da Graça made the recent restoration a new window was placed in the Foyer to provide a view into the entrance patio (Fonseca 2008). The only exhibition space where natural lighting, in this case zenithal lighting, was present from the beginning, is the central area (Escolano 1998).

The central area of the building is the two-storey-space; in the exhibition it was called 'the ship' (Fernandes & Cannata 2001). In this space you can feel that the scale of the building is hard to comprehend. Apparently the architect wanted to provoke a kind of feeling with this space. A confrontation is made between the human being and the ocean. We are extraordinarily small in comparison to the deep blue ocean.

During the visit of the building you will get a lot of information to absorb but '"*the building is a paralyzed ship that takes us on this journey*"' (Dias 2005).

3.1.1.3 Programme

Pavilion of the Knowledge of the Seas

Initially, the building was the stage of the exhibition about the knowledge of the seas during Expo '98. The conception of this exhibition was the work of ARX Portugal Architects, *i.e.* José Mateus and Nuno Mateus (Reis 1998).

The Pavilion of the Knowledge of the Seas showed the process of the discovery of the knowledge and the appropriation of the Oceans by the mankind (Reis 1998). The Portuguese nation played an important role in this discovery, especially in the second half of the 15th century. This exhibition pays attention to the learning process of sailing, the discovery of the area of the oceans, the big adventure into the deep, the innovating technologies and to the exploration of the resources of the sea.

As mentioned in the Official Catalogue (Reis 1998) the tour in the building could be seen as a story composed by the different spaces of the exhibition. In every room you received new information about the Seas and the story was being completed step by step. The visit to the exhibition was a voyage of discovery itself: in every room you discovered a new aspect of the theme.

In general the exhibition was composed of four sectors and two intersectors (Escolano 1998). The four sectors were (names in Portuguese) : *Sulcar os Oceanos, Investigar, Mergulhar* and *Explorar*. The two intersectors were *Magalhães* and *Challenger*. There was also *Nave* (tall ship) and to end the exhibition there was a space for reflection, *Avançar*.

On May 22, 1997 a Portuguese law was enacted about accessibility of public buildings, Decreto-lei 123/97. As the buildings for Expo '98 were built in this period they were complied with this law.

Pavilion of Knowledge – Ciência Viva

The Lisbon World Exposition lasted from the 21st of May until the 30th of September 1998 (Machado 2006). On the 25th July of 1999 the building was reopened (Pavilhão do Conhecimento 2010). From then on it was the stage for a Ciência Viva Centre like there are more in Portugal. These centres are the responsibility of the Minister of Science and Technology. The Pavilion of Knowledge – Ciência Viva holds awareness-raising projects about science and technology for the Portuguese people. It is also the driving force behind the network of Ciência Viva Centres like the Oporto, Faro and Coimbra Centres. The Pavilion has the opportunity to host interactive exhibitions from many science centres in the world, *e.g.* Cité des Sciences in Paris (interview accessibility employee 2010).

In the beginning the stages created for Expo '98 were used without making adaptations for the exhibitions of Ciência Viva (Fonseca 2008). The 'white sheets' conceived by the architect stood out well[2]. As the years passed it became necessary to think about a general renovation of the Pavilion.

In May 2006 a new programme was formulated for the renovation of the Pavilion of the Knowledge (Fonseca 2008). The architects rethought the logical way of visiting the building because there had been some problems before. Some spaces were removed and some were transformed. The biggest changes were a new auditorium, a new bookshop, a new cafeteria and a new administrative zone. The Foyer and the entrance were thoroughly transformed. The plan of the first floor is displayed in Figure 36. For additional plans and sections consult Appendix A.

Recently the accessibility law of 1997 was amended and on August 8, 2006 Decreto-lei 163/2006 was constituted. The renovation of the Pavilion took place in this period, so it is supposed to be in accordance with this recent law.

ARRIVAL

The main entrance of the Pavilion of Knowledge is of course the striking spiral-shaped ramp at the access patio (Reis 1998). Even from a certain distance potential visitors can perceive (see, hear) the fountain in the middle of the ramp (Figure 18 and 19). The presence of water probably refers to the overall theme of the Expo and to the personal theme of the Pavilion, *i.e.* oceans and seas respectively.

Figure 18 Front View of the Ramp

Figure 19 Sideview of the Ramp

Next to this main entrance an exterior elevator is situated. During Expo '98 this elevator was being used for VIPs as well as disabled people (Reis 1998). People who take the elevator and those who use the ramp meet again at the first floor in the entrance hall.

Another entrance was situated at the back of the building in front of the bookshop. In the beginning this entrance was meant for group visits (particularly students).

[2] See 'Architectural Concept', p.34

Since the renovation these entrances still exist but nowadays they are supposed to be used in a different way (interview accessibility service 2010). All the visitors including groups of students enter via the central ramp. The previous group entrance is now the actual exit of the Pavilion. People with a physical disability or parents pushing a pram can use the exterior elevator. Unfortunately the exterior elevator is broken and in that case the people have to enter by the exit of the building and take the interior elevator to visit the first floor.

ENTRANCE HALL

The majority of visitors enter by the ramp to the actual entrance (Figure 20). Since the renovation by Carrilho da Graça a kind of black box is placed to gather all the entrance functions (Fonseca 2008). Here you can buy tickets or provide information about the museum. In this entrance hall also the toilets are situated. The bathroom for women is on the left side when you enter, the one for men and persons with physical disabilities on the right side. The little corridor which gives access to the ladies' bathroom gives also access to offices of the animators of the Pavilion.

CORRIDOR

For Expo '98 a reference was made to the central theme of the Expo, *i.e.* oceans. After crossing this corridor the visitors were supposed to feel like being under the water and the exhibition could finally start (Reis 1998). Now the corridor still should provide a similar feeling to the visitors. This corridor is black and dark but illuminated with soft light (Figure 21). It is obvious that behind this corridor something will happen, *i.e.* the exhibition will start.

Figure 20 Entrance Hall

Figure 21 Corridor

FOYER

The first space of the museum is the Foyer (Figure 22). This is a space to distribute all the visitors through the Pavilion. Carrilho da Graça made for the renovation a large opening with a view on the entrance patio (Fonseca 2008). In this way more light is brought into the building. It is nice to watch people entering when you are inside and it is pleasant to see people visiting the Pavilion when you are entering. During the renovation a circular mezzanine is established and the space has

enlightened walls. The walls are perforated, in this way the light is reflected (Figure 23). The upper part of the new mezzanine is used by the administration.
Previously, a Cybercafé and a Multimedia Centre were placed in the Foyer (Gama *et al.* 2003). Now they also did some renewals for both sides of the space. A laboratory is placed where the Multimedia Centre was situated before. On the spot of the previous Cyber Café a computer space was created (Fonseca 2008). Here some workshops are organized like 'my first webpage' for children or an introduction about internet for the elderly (Pavilhão do Conhecimento 2010).

Figure 22 Foyer

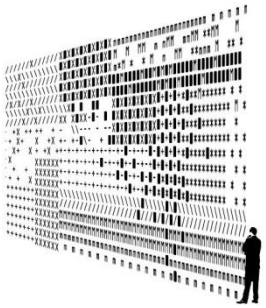

Figure 23 Design of the Foyer

The Foyer is the place for the distribution of the visitors inside the building. Up to this place visitors do not need a ticket. From here onwards you can enter the exhibition area after showing your ticket to a machine. Another option is to visit the laboratory in group, to do some research on the computers or to enter the new auditorium.

AUDITORIUM

After Expo '98, a small auditorium was contrived on the ground floor (Gama *et al.* 2003); it was part of the actual space for a temporary exhibition[3]. This auditorium turned out to be too small and its location was not ideal either. For the renovation in 2006 Carrilho da Graça rethought the auditorium; it is located next to the Foyer now (Fonseca 2008). The auditorium is not always accessible to the public; it is opened for lectures only. The space has approximately 200 seats (Figure 24).

Figure 24 Auditorium

[3] See 'Amazona', p.42

EXHIBITIONS

The Pavilion of Knowledge – Ciência Viva hosts permanent and temporary exhibitions (Pavilhão do Conhecimento 2010). At the moment there are three permanent exhibitions: 'See, Do and Learn!', 'Explora' and 'The Unfinished House'. Until last year 'Live Mathematics' was a permanent exhibition too. The temporary exhibitions are often cooperations between two or more science centres or loans from another science centre. Up to now the Pavilion has hosted 18 temporary exhibitions.

NAVE

The Foyer also gives access to the Nave after you have shown your ticket to a machine. Within this vertical volume you have access to several spaces. On the first floor you can enter the three permanent exhibitions. From here onwards, you have also the possibility to go downstairs to the temporary exhibitions by one of the two flights of stairs or by the interior elevator.

The translation of 'Nave' is 'ship'. This is the tall central space of the exhibition with zenithal natural lighting. During Expo '98 the visitor was faced with the greatness of the Ocean here (Reis 1998). It was a tribute to the constructors of ships and to all the people who used boats to gain knowledge of the sea. The concept of the space was 'Ship in a Ship'. It was not a real boat which was placed in this room but a combination of wood, iron and composed fibres which form the basis for the construction of a ship.

On the ground floor of the Nave one of the temporary exhibitions is situated (Figure 26). At the moment, it is the exhibition 'Sexo.. e então?!' coming from Cité des Sciences in Paris (interview accessibility employee 2010). It is an exhibition about sex and love intended for youngsters between 9 and 14 years old (Pavilhão do Conhecimento 2011d), but it can be interesting too for everybody and particularly for parents, teachers and educators. The entrance of this exhibition about sex is being marked by an enormous red heart where you have to walk through (Figure 25). The exhibition is divided into different modules with specific names: being in love, puberty, making love, making a baby, forbidden for adults, open the eyes and at the end a questionnaire about the sexual life. By means of this exhibition the museum wants to inform, prevent and protect children by providing a humoristic perspective (based on the French comic book Titeuf and Nádia) on an important matter.

Figure 25 Entrance Sexo.. e então?!

Figure 26 Sexo.. e então?!

EXPLORA

The exhibition 'Explora' is one of the permanent exhibitions of the Pavilion nowadays. It is situated on the first floor of the museum and in direct connection to the Nave (Figure 27). It is an exhibition about Nature, focusing on human perception (Pavilhão do Conhecimento 2011c). The space is conceived as a forest of natural phenomena by introducing 44 interactive modules to the visitors (Pavilhão do Conhecimento 2010). Making a giant soap bubble, touching a tornado, … are just a few features of the exhibition (Figure 28). At first sight the phenomena seems complex, but here they are dealt with in a funny and familiar manner.

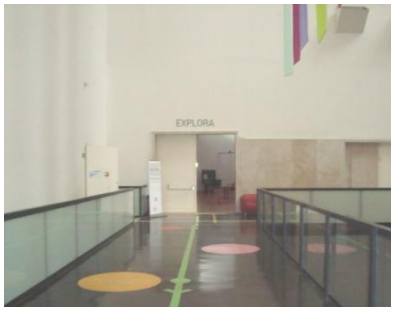

Figure 27 Entrance Explora

Figure 28 Explora

CASA INACABADA

The name of this space is 'Casa Inacabada' or 'The Unfinished House' but actually this space contains two permanent exhibitions, *i.e.* 'See, Do and Learn!' and 'The Unfinished House'. Just like the other permanent exhibition, 'Explora', this one is situated at the first floor and accessible from the 'Nave' (Figure 29).

The exhibition 'See, Do and Learn!' is based on the three essential phases of acquiring knowledge: observing, experimenting and learning (Pavilhão do Conhecimento 2010). This exhibition hosts 66 interactive modules from two European science centres (Pavilhão do Conhecimento 2011e). The natural phenomena raise doubts and questions about science. By doing activities like launching a rocket or lying down on a bed of nails you will find out the answers to some frequently asked questions about nature (Figure 30).

Figure 29 Entrance Casa Inacabada

Figure 30 See, Do and Learn!

'Casa Inacabada' or 'The Unfinished House' from Cité des Sciences in Paris is also placed in this exhibition space (Pavilhão do Conhecimento 2011b). It is a working space with materials and machines that are used for constructing houses: beams, bricks, stairs, cranes, ... (Figure 31). Only children between three and six years old are admitted as workers on the construction site (Pavilhão do Conhecimento 2010). These little workers have to put on a safety helmet and a work vest before entering on the site which is perfectly adapted to their size.

Figure 31 Casa Inacabada

AMAZONA

The exhibition 'Amazona' is another temporary exhibition of the Pavilion, located on the ground floor and connected to the 'Nave'. Before a small auditorium was supplied in this space, but since the renovation by Carrilho da Graça it was replaced by a new auditorium next to the Foyer (Fonseca 2008). The entrance and the exit of this exhibition space is still by means of the same ramp (Figure 32). The exhibition is not as interactive as the previous ones but nevertheless it can be interesting for the public (Figure 33). Between 26th December 2009 and 9th January 2010 a group of photographers, designers, journalists, doctors and teachers went on a trip to the Amazon Rainforest (Pavilhão do Conhecimento 2011a). This exhibition shows the impressions of these travellers of the rainforest through drawings, paintings, pictures, notes, objects and movies.

Figure 32 Entrance Amazona

Figure 33 Amazona

GROUP AREA

The themes of the museum are closely related to the subject matter taught in high schools (interview accessibility employee 2010). For this reason the Pavilion is frequently visited by groups of students a group and a special group area is useful. The zone is located close to the exit and provides lockers, a zone with tables for lunch (Figure 34) and bathrooms. In the group area there is also a separate little room where the animators can do a quiz or explain something to students.

BOOKSHOP

At first, a small bookshop was situated at the entrance hall close to the ticket service. By locating the bookshop near the exit the visitors have to pass the bookshop before leaving the Pavilion and consequently, the probability they buy something is higher than when the bookshop is located near the entrance. The new bookshop is also part of the renovation by Carrilho da Graça (Fonseca 2008).

CAFÉ

The architects designed a café with a terrace on the ground floor next to the bookshop (Fonseca 2008). This bar also has a direct connection to outside, so it is not necessary to visit the exhibition to drink or eat something here.

Between the bookshop and the café there are some new lavatories. In this way it is possible to open the café without the Pavilion being accessible, for example on closing days or during the evening. Until now this advantage is not being used but maybe it will be in the future (interview accessibility employee 2010).

EXIT

The former group entrance was located here[4]. In the past, visitors were supposed to return to the entrance to leave the building. Carrilho da Graça defined a more logical exhibition track for the renovation (Fonseca 2008). Now it is possible to leave the Pavilion at the end of the visit while passing by the bookshop (Figure 35).

Figure 34 Group Area

Figure 35 Exit

[4] See 'Arrival', p.37

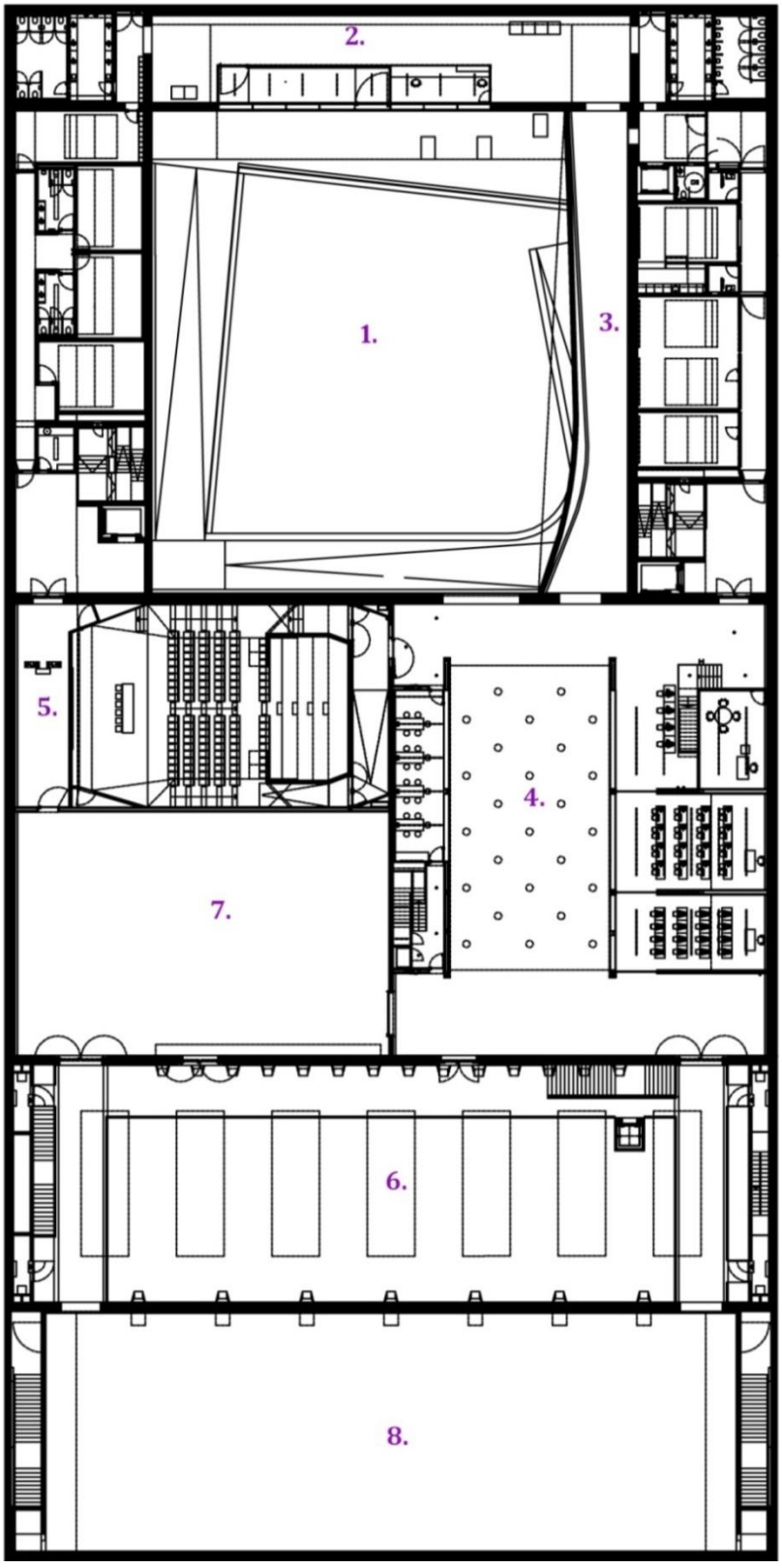

Figure 36 First Floor (1/500)

1. Arrival 2. Entrance Hall 3. Corridor 4. Foyer 5. Auditorium 6. Nave
7. Explora 8. Casa Inacabada

3.1.2 Analysis

After an extensive description of the Pavilion of Knowledge in the previous part, we will now analyse the building by means of the concept of the architect and different perspectives. This analysis has a similar structure as the next analysis of Museum M, which makes it easy to compare both experiences of the user/experts.

3.1.2.1 Different Perspectives

At first, we will provide more information about the sources which/who are consulted for the analysis. Next to the architect we have conducted an interview with an employee of the museum, in this case an accessibility employee. As we are interested in the experiences of persons with an impairment, we took a physically impaired person and a visually impaired persons on a walk through the Pavilion and recorded their experiences. To complement this analysis we have read some (professional) literature about the building.

The user/experts of this case study will be described under a false name for privacy reasons. We are very pleased these persons were interested in a visit but we respect their privacy. Only the person with a physical impairment did not bother about taking pictures. For that reason, we will not publish pictures of the visit of the blind user/expert. We do provide some pictures of other visually impaired persons who visited one exhibition in our company. We have to mention as well, associations and past experiences may influence his/her experience of the Pavilion (Malik 2006).

ARCHITECT

The architect of the Pavilion of Knowledge is João Luís Carrilho da Graça. His office was founded in 1977 in Lisbon and nowadays he is a famous Portuguese architect (Byrne 1995). He is experienced in conceiving cultural buildings: the Poitiers Theatre and Auditorium, the University of Music, the Centre of Living Science and lately the Iberian Museum of Archaelogy and Art in Abrantes (Pimenta 2011). Because of his excellent work he was often nominated for and even won several architecture prizes.

We conducted an interview with Carrilho da Graça in his architecture office. He says that he always wants to do better than regulations prescribe. For the theatre in Poitiers he had a meeting with people with disabilities to talk about the building and how it was going to be built. With this example he wanted to show he really pays attention to the opinion of these persons. The architect describes his intentions as follows: "*My objective, in a certain way, is making people happy. Creating spaces that support the life of people. And this seems like a relatively banal or superficial statement, but I don't think it is. It is fully accurate and important*" (Pimenta 2011).

The Pavilion was built in 1998 and so it complied with the accessibility regulations of 1997. Carrilho da Graça and his employees were also responsible for the renovation which was realized in 2010. For this renovation he assured us that he also tried, just as in the theatre of Poitiers, to pay attention to disabled persons.

EMPLOYEE OF THE MUSEUM (ACCESSIBILITY EMPLOYEE)

The Pavilion of the Knowledge employs a person who has a full time job working on accessibility in the museum. She has been working here since 1999, originally as an animator. She saw disabled people visiting this museum and she became interested in how they experience this building and whether they have problems.

Since 2000 she is working full time on the accessibility of the Pavilion. This is very exceptional in Portugal; she does not know of any similar practices in other Portuguese museums. Most of the time people of the educational service are working around accessibility when they have time for it. But this centre pays attention to it and soon a second person will help her because it is becoming too much work. There are no funding problems like in other museums.

The museum provides tours for people with disabilities. She is the one who guides these tours. This service is very much appreciated: every week some persons with disabilities (physical, sensory or mental) visit the Pavilion. Some groups visit the Pavilion on a regular basis, for instance every Wednesday afternoon. She also organizes special tours for small groups when the museum is closed for the general public. For these tours she also makes extra tools to communicate with the visitors. An example of her work is a book in relief about an exhibition so that a blind person can be informed about the exhibition.

It seems to be uncommon that a person has a full time job on accessibility in a Portuguese museum, but still the work results in minor improvements. The direction allows her to work on the accessibility, but when they decide to alter the Pavilion, they neglect to ask her opinion. Afterwards it is always hard to re-adjust it.

This person is not disabled but thanks to her extensive experience she has an eye for the problems and qualities of the building.

PERSON WITH A SENSORY IMPAIRMENT

To include another perspective of the museum, we visited the building with a man with a visual impairment. Tiago is not blind since his birth but lost his sight a few years ago. In the beginning it was of course very hard to adapt but gradually he is becoming more independent. He makes use of a white stick to feel the built environment.

Because Tiago is interested in architecture, he already visited the building before he lost his sight. Afterwards he visited the Pavilion again with the use of a tactile model. He already had an impression of the building and he knew what to expect during the

visit. This visit took place a few years ago, so some things could have changed in the meantime. Tiago remembers that there is no outlined course to follow, but you can choose yourself the order of the spaces to visit. His experience can point out things that we – sighted people – do not pay attention to.

We also attended a tour with a group of young blind people. They visited the exhibition about sex. They did not visit the whole building, but rather paid a lot of attention to the exhibition itself. Yet, their perception was interesting for understanding how they experience objects in general.

PERSON WITH A PHYSICAL IMPAIRMENT

To gain a better understanding of the experience of people with diverse abilities, we also visited the building with a woman in a wheelchair. Sofia was born without legs. Because of her experience of many years, she is very skilful at moving with her wheelchair. She has a wheelchair without space to put the feet on. Her wheelchair is also practical as it fits in the back of her car. With this kind of wheelchair Sofia can move very easily. For a person using another type of wheelchair the experience would probably be totally different. In an electric wheelchair it may be easier to move around the museum sometimes. For someone with a manual wheelchair or who does not have developed arm muscles it may be more difficult.

Sofia visited the Expo site during Expo '98, but she thinks she did not visit this Pavilion. It does not matter whether she visited it or not because the content (and so the experience) of the Pavilion is totally different now. We will consider this as the woman's first experience with the exhibition. Like the person with a visual impairment, this user/expert could point out characteristics of the building which are difficult or comfortable for her, but which escape our attention.

PROFESSIONAL LITERATURE

The Pavilion of Knowledge was one of the five most important buildings of Expo '98. Logically a lot is written about this building. Most of the information we found was published shortly after the opening of Expo '98. Some journalists wondered what would happen to the Exposition site when the Expo was finished. These perspectives are interesting because now we can compare them to what really happened on this site. About the renovation by Carrilho da Graça we found only a few articles.

We will focus on articles which were written by independent journalists and not by Carrilho da Graça himself. The latter can be used to analyse the perspective of the architect.

3.1.2.2 Concept meets Reality

For this part we have selected certain parts of the concept. We will go from macro to micro aspects of the building. First, we will consider the overall context in which the building is established. The materials and the general lay-out of the building will be discussed under 'Exterior'. After that, we will first consider the first impression and all the possible entrances, then the main entrance. Before the exhibition itself starts, the visitors are gathered in one space. Logically, we will also explore the exhibition spaces themselves. In the end, we will focus on the central space of the building and the concept of lighting.

These aspects are chosen because they are important for the concept itself. They are preferred as well for the similar structure to the next analysis, the one of Museum M. In this case, both the analyses can be easily compared.

CONTEXT – "*The Expo wanted to stimulate the urban conversion of this eastern zone and the ideal integration with the surrounding areas*" (Sat 1998).

For many, the main reason for Expo '98 was not the promotion of the country, but the stimulation of the regeneration process of Eastern Lisbon (Ferreira et al. 1996). This eastern part of the city was deteriorated because of the presence of many factories[5]. "*In this context, the normal development of the urban waterfront (..) can be re-established. This could lead to restoration of the east-west symmetry of the city*" (Ferreira et al. 1996). The symmetry of the city is specified by Sat (1998) as follows: *"(...) the 'symmetry' that has characterized the City of Lisbon since its founding, centered on the hill of the Castle – and today's Lower Pombalina – with an eastern border at the Trancão River, one of the borders of the zone of intervention*."

"*The fairgrounds – 50 hectares – is at the heart of the zone of intervention, its 'institutional centre', arranged around the Doca dos Olivais in a scheme that reminds us of Seville, where the main pavilions surrounded the Lago de Espana*" (Sat 1998). The zone of intervention enclosed around 50 hectares, its most important buildings were arranged around the Doca dos Olivais (Sat 1998). In the opinion of Sat (1998), the scheme of the buildings around the dock is similar to the scheme of Seville. The main pavilion of Expo '92 were also situated around a central dock, *i.e. Lago de Espana*. The Pavilion of Knowledge was one of the five main Pavilions of Expo '98; for this reason it was situated in the neighbourhood of the dock (Ferreira et al. 1996). This dock is described as: "*Doca dos Olivais (the port), which is the real centre of Expo '98*" (Tilman 1998).

At the time João Luís Carrilho da Graça was commissioned to design the Pavilion, the site was still empty[6]. According to the architect, none of the architects elected to

[5] See 'Expo '98', p.30

[6] See 'Architectural Concept', p.34

design the different Pavilions knew what the other Pavilions would look like. Usually when architects conceive a building they try to establish a relationship with the context, *i.e.* the other buildings. In this case this was not yet possible. During the construction phase of the Pavilions, Álvora Siza Vieira - the architect of the Portuguese Pavilion (Figure 37) - and Carrilho da Graça found out that their buildings fit very well together. Nevertheless the professional literature mentions: "*Siza anticipates the demands of the programme and the characteristics of the environment*" (Tilman 1998). The Pavilion of the Oceans (Figure 38), now known as Oceanarium, is situated between these two buildings. It is a project of the North-American architect Peter Chermayeff (Centro Português de Design 2001). A journalist writes that this Pavilion is: "*considered by those responsible for the exhibition as perhaps the most important because it encloses materialistically the diverse seas and respective fauna*" (Toussaint 1999). Carrilho da Graça confides to us that building is not his sort of things. Another publication compares the three Pavilions as follows: "*More solemn and therefore more lasting, although running another type of risk, particularly the Pavilion of Knowledge of the Seas with its reductionist communication, are precisely this building and Álvaro Siza's Pavilion of Portugal. On the other hand the Oceanic Pavilion wants to combine everything, Treasure Island with High Tech, ornamental tiles with fish, sails and masts with systems of stretched fabrics*" (Ferreira *et al.* 1996).

Figure 37 Portuguese Pavilion

Figure 38 Pavilion of the Oceans

The park can be reached by public transport[7]. The blind user/expert makes use of the metro. The terminal of the metro line is situated at the Orient Station. Tiago is able to take the metro on his own, but starts having problems at the terminal. The Orient Station is quite large so he thinks a guidepath[8] would be interesting here. For reaching the park he prefers walking through the shopping centre. In this way he does not need to cross a road and he recognises the sound of people running errands at the supermarket Continente (Figure 39). After passing through the shopping centre he is in the park of the Nations.

The park has been drastically changed through the years[9]. Tiago was not aware of the fact cars have access to the park now. The distinction between pavement and

[7] See 'Location and Transport', p.32

[8] See 'Motion', p.27

[9] See 'Location and Transport', p.32

lane is not very clear, only marked by the small piles, and he thinks this 'solution' is dangerous both for visually impaired persons and for children (Figure 40). An aspect about the park he likes is the change of ground material. He touches the ground with his white cane. On certain spots, wood is used instead of cobblestone; he appreciates the change in sound of his cane. The wood often indicates a small fountain which is of course more dangerous for him. We accompanied him for the walk from the Orient station to the Pavilion. He thinks he would not be able to cross the Park on his own. When he wants to come alone, he has to take a taxi or a bus which stops in front of the Pavilion. The accessibility employee of the museum knows the walk from the Orient station to the Pavilion is quite difficult for a visually impaired person. The layout of the park changes regularly, for example the presence of the cars and the wood. When a blind student intends to visit the Pavilion she tries to give advice for reaching the museum in advance.

Figure 39 Supermarket Continente

Figure 40 Park of the Nations

As mentioned by the employee of the museum, the traffic has changed. In an article of 1999, one year after the Expo, we read: "*(...) the demands made by the owners of the shopping centre which also has an entrance from the Alameda dos Oceanos, with controlled traffic. The individuals request unlimited access by car, but if that happens the exhibition area will be invaded by vehicles, just like any Portuguese city*" (Toussaint 1999). A bit further the text mentions "*Until then a lot can happen to the original plan*" (Toussaint 1999). The prediction of 1999 seems to have come true.

The wheelchair user/expert comes to the museum by car. Sofia owns an adapted car and is very independent thanks to this vehicle. During the weekend, she came to the park to check out the parking spaces. It is important that there is a parking place close to the building. Sofia does not like to use public transport because of the difficult accessibility. At metro stations there used to be no elevators, so coming by metro was out of the question. Some buses are adapted to wheelchairs, but most of them are not. Sofia prefers coming by car. For her it is a good thing cars are allowed in the park, because this way she is assured of a parking place in the vicinity of the Pavilion.

The signage was developed for Expo '98 (Figure 41), but is adapted for the Park of the Nations[10]. About this signage an article mentions: "*It should answer simple*

[10] See 'Location and Transport', p.32

questions, supplying a great amount of information. The plan is also the storyteller of its user's possible routes, even if it does so in ways which are not necessarily functional" (Centro Português de Design 2001). During Expo '98 the organisation even paid attention to visually impaired visitors: "*The system includes a special map for the blind and people with impaired vision through the use of tactile maps representing the general outlay of the grounds and partial views, relief structures, captions in Braille and a colour scheme designed with the vision-impaired in mind*" (Centro Português de Design 2001). Because the layout of the Park has changed (Figure 42) through the years these maps will not be useful anymore. Unfortunately we are not aware of new maps having been created.

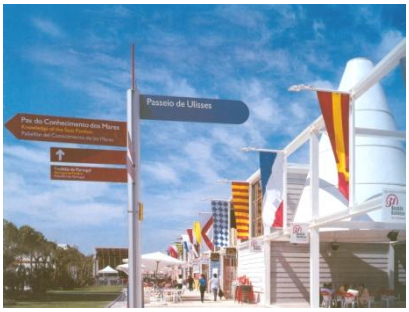

Figure 41 Signage during Expo '98


Figure 42 Contemporary Signage

EXTERIOR – "*The vertical and suspended horizontal elements cross megalithically in white concrete*" (Ferreira *et al.* 1996).

"*First we see the megalithic cross between the vertical and the horizontal planes of the concrete volumes. Then we feel that the horizontal mass is in a kind of magic suspension. In that mass we hollowed out a stone square*" (Perrault 2000). Another architecture critic describes the general volume (Figure 43) as follows: "*It is an apparently simple combination of a parallelepiped placed vertically with another horizontally above the ground"* (Ferreira et al. 1996).

The accessibility employee mentions that a model of the Pavilion was made in 2001. Unfortunately this model is not correct anymore due to the renovation in 2006 by Carrilho da Graça. For this reason the model is not used anymore and is carelessly stored in the garage of the Pavilion. Tiago has already been consulted and at that occasion he had the opportunity to touch the model. He remembers this tactile experience but admits that he did not need the model because he already knew the building quite well. The accessibility employee remembers that he did not touch the model as other persons who have a visual impairment do. She thinks he is not yet used to this kind of tactile experiences because he lost his sight relatively recently.

The materials used for the façade are white concrete, natural stone and wood (Figure 44). In the professional literature we read: "*The stone is the white limestone in which the old areas of Lisbon are built. 'Lioz' is an excellent stone, which in the midst of the baroque shows us a variety of maritime fossils. The stone is the leading theme of the*

story" (Perrault 2000). In our opinion the applied materials seem to refer to the theme of the exhibition, *i.e.* the Oceans.

Figure 43 Megalithic Cross

Figure 44 Concrete, Wood and Stone

Although the accessibility employee was not really convinced about his tactile experience on the previous visit, Tiago seems to pay attention to the tactile experience of materials. In the beginning of the visit he mentions that there are different types of stone. In his opinion even the same type of stone can feel different as the finishing can change the feel of it considerably.

An architecture critic sums up: "*With minimal constructive means and materials a strong expression is reached*" (Tilman 1998).

APPROACHING THE SITE – "*With its presence we wanted to build the silence, the interim with which we started the visit*" (Fernandes & Cannata 2001).

With respect to the Pavilion, the professional literature often quotes John Cale: "*The responsibility of the artist consists in perfecting his art until it loses interest and remains attractive. The soul, itself, is to such an extent simple that it cannot have on things more than one idea at a time. A person cannot have but one attention*" (Perrault 2000).

The feeling Carrilho da Graça wants the visitor to experience is inspired by a Pavilion of Expo '92 in Seville. In an interview the architect explains: "*Tadao Ando´s pavilion in Seville immediately came to my mind. You would go up an escalator and arrive at an outside platform leading your eyes into the exterior landscape and creating an interval just before the visit began*" (Stereomatrix 2001).

In the company of the blind user/expert we are coming from the Orient station on foot. When we are walking next to the *Olivais* dock (Figure 45), Tiago is already aware of the proximity of the Pavilion (Figure 46). He pays attention to the sound of the water in the middle of the ramp. For him the water is a good way of locating the Pavilion in the park. The water refers to the theme of the exhibition, *i.e.* the Oceans: "*We have very little water, a distant reflection on the docks*" (Perrault 2000). The building is announced visually as well: "*The horizontal block is vertically suspended, which allows the continuity of the public area between the boulevard and the dock*" (Ferreira *et al.* 1996).

Figure 45 Along the Olivais Dock

Figure 46 Proximity of the Pavilion

The entrance has changed repeatedly[11]. Of course the main entrance is the ramp. But the exterior elevator and the 'entrance' near the bookshop have changed functions. The accessibility employee tells us that all visitors, even large groups, have to come by the ramp. If walking up the ramp is not possible, usually a person can opt for the exterior elevator. During the visits in the company of the user/experts, however, the exterior elevator is broken and they have to enter via what is actually the exit. Near the bookshop, they can take the interior elevator.

Sofia parks her car in a parking space along the *Alameda dos Oceanos* in front of the Pavilion. She admits she has problems finding the entrance, but luckily security agents are so kind as to help her. She arrives at the ramp, but it is not yet clear where the entrance for wheelchair users is situated (Figure 47). There is no signage indicating another elevator except for the broken exterior elevator.

With our help Sofia reaches the provisional entrance at the back. The accessibility employee indicates a little step of four centimetres (Figure 48). The architect does not know why there is a small step; during the conception phase he probably was not conscious about the fact that it can be a problem for some persons. Nowadays there is a small ramp overcoming the step. The accessibility employee says this solution was only provided in 2010. She mentions that several wheelchair users had troubles with this step. The group entrance used to be here too. In that period she noticed persons stumbling over this step because it is not visible when a person is in front of you. Sofia is very pleased with the solution. She thinks that if the small ramp was not there, the step would be a problem for her.

Figure 47 Signage of the Entrance(s)

Figure 48 Step at the Exit

[11] See 'Arrival', p.37

The user/expert with a visual impairment does not have problems to situate the Pavilion itself thanks to the water. Tiago knows the water is in the middle of the ramp but he meets with difficulties when trying to find the starting point of the ramp. The water makes it even more difficult. After a while he is able to find the ramp because he has already been here before. He thinks it will be difficult for visually impaired persons who come here the first time. He mentions a more recent project designed by Carrilho da Graça, the *Museu Oriente* in Lisbon. Water is also used over there but in his opinion it is used in a better way. On the other hand the accessibility employee mentions that Carrilho da Graça made the *Museu Oriente* accessible for physically impaired persons, but in her opinion he did not pay enough attention to persons with a visual impairment.

Finally both user/experts are able to find the entrance but it is not a matter of course. Even the architect himself is not aware of the change of the entrances, so maybe it is only logical that visitors have problems in finding the right entrance. During the interview the architect tells us that the organisation of Expo '98 forced him to create the main entrance on the first floor. Tiago mentions he does not like ramps so much. He actually prefers one-storey buildings. According to with the architect, it was an obligation of the organisation. The architect placed an elevator next to the ramp. A group of visitors including a physically impaired person have to split up at ground level and meet again in the entrance hall. The architect says he actually does not like this division so much. Usually he tries to create one entrance for both disabled persons and their friends or family. The accessibility employee does not consider this distinction as a problem when the exterior elevator (Figure 49) is working. Nowadays persons who prefer the elevator have to take the interior elevator (Figure 50) and cross the whole building to meet again in the entrance hall. The size of the exterior elevator is not ideal either for a group of wheelchair users or parents with baby carriages.

Figure 49 Exterior Elevator


Figure 50 Interior Elevator

ARRIVAL – "*The volumes of the building breathe immobility, the ramp means movement and tension*" (Perrault 2000).

In the professional literature we find a lot of information about the arrival. Visitors can enter the building by the patio. Fernandes and Cannata (2001) describe this patio as a density in which they carved a volume. This patio is further specified as "*a vertical volume without a roof"* (Fernandes & Cannata 2001). Not only the patio is

mentioned while talking about the arrival, also the ramp is important. "*A ramp which develops dynamically around the courtyard"* (Fernandes & Cannata 2001). Tilman (1998) portrays this dynamical movement as follows: "*The ramp starts with a twist which is repeated in the wall above*".

In the middle of the patio there is a fountain (Figure 51). The architect confirms that the water was conceived for Expo '98 and is still part of the building nowadays. He mentions that the fountain is important because of the sound. As the professional literature describes: "*We are then in the square and we have the water whisper*" (Fernandes & Cannata 2001). The person with a visual impairment recognises the sound of the water from a distance[12]. By means of his white cane, Tiago is able to find the starting point of the ramp. While walking on the ramp (Figure 52) he admits that the sound of the water was louder in his memory. In his opinion the water is useful to locate the Pavilion, but while climbing the ramp it does not help him much to orientate.

Figure 51 Fountain

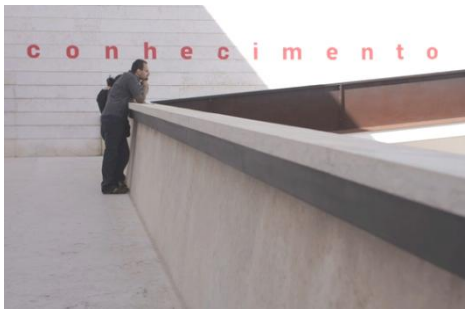

Figure 52 On the Ramp

Situating the entrance on the first floor was obliged by the Expo '98 organisation. The architect wanted to create an architectonic element for the entrance, *i.e.* the ramp. In his opinion the ramp needs to cover a long distance for the visitors to fully experience the architecture. An architecture critic appreciates the arrival and describes it as follows: "*The road started, we begin to climb. If we look back we can see the water by the docks. We enter the building*" (Perrault 2000).

The person with a physical impairment opts for the elevator to enter but first she tries the ramp. Sofia is able to ascend a few metres but it is very difficult (Figure 55). She says that if she was using an electric wheelchair it would probably be easier. Still she thinks the gradient of the ramp is too steep. This gradient would be ok if the distance were small, but the length of the ramp in combination with its gradient is too hard for her. The visually impaired user/expert does not have complaints about the gradient of the ramp. Although the ramp is not an impediment for him, Tiago guesses that for older persons or persons using a manual wheelchair it is an insurmountable obstacle. For these persons he would prefer to use a ramp which is constituted of inclining parts in combination with flat planes. Tiago thinks the ramp covers a long distance. The accessibility employee admits that the gradient indeed is

[12] See 'Approaching the Site', p.52

too steep, although the architect thinks it is perfect. He even mentions that he always tries to do better than the law.

Tiago thinks it is important for a ramp to have a banister. With the help of his white cane he is able to situate the inner banister of the ramp (Figure 53). He walks up the ramp by touching it with the cane; all he has to do is follow the banister to climb the ramp. Going up the ramp does not cause any problems for him. The accessibility employee agrees that banisters are very important. For this reason, she indicates the outer banister made of steel (Figure 54). She mentions that this outer banister was not established there in the beginning. In that period several visitors fell from the ramp because there was no distinction in material or colour. The accessibility employee emphasizes that this outer banister was really necessary. Tiago feels the steel banister and suggests to add another one in the middle of the ramp because of its width. He admits that these extra banisters would probably not be very esthetical.

Figure 53 Inner Banister

Figure 54 Outer Banister

As in the beginning of the visit the blind user/expert admits the finishing of a stone impacts upon the way it is perceived[13]. He likes the fact the ramp is made out of stone because in his opinion it provides an excellent grip. Tiago only has doubts about the grip when it is raining. The user/expert with a physical impairment notices the difference in finishing too (Figure 56). Sofia tries to ride up the ramp with rough finishing, but this is still not easy at all. She thinks in rainy conditions, the ramp is not safe. The accessibility employee knows in the past several persons have fell down because the ramp gets slippery when wet.

Figure 55 Ascending the Ramp

Figure 56 Different Surfaces

[13] See 'Exterior', p.51

When Tiago arrives on top of the ramp (Figure 57), he tries to find the actual entrance. He leaves the ramp and walks straight ahead until he bumps into the wall. From then on he follows the wall with his white cane (Figure 58). Suddenly he feels the door opening. At the time of the visit a group of students have just entered the building, so the sound of the teenagers also serves as a guideline (Figure 59). Following the sound is of course not possible when there is nobody in the entrance hall.

Figure 57 On Top of the Ramp

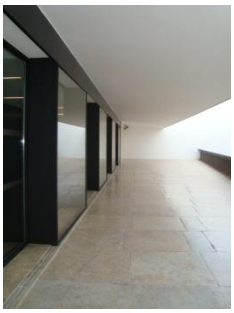

Figure 58 Door Opening

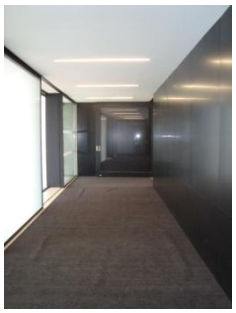

Figure 59 Entrance Volume

The physically impaired user/expert enters via the actual exit, takes the interior elevator and crosses the building to the entrance[14]. We want to observe her experience of the entrance volume supposing she would be able to climb the ramp. The first thing Sofia observes is the wheelchair next to the ticket office. It is visible because the entrance volume is partly made out of glass. In her opinion showing this wheelchair is kind of ironic. By means of the wheelchair they want to demonstrate to the visitors that they care about accessibility. Unfortunately the organisation of the Pavilion is not aware of the fact that physically impaired persons have difficulties to reach the ticket office. What she is referring to is obviously the ramp, but there seems to be more barriers in this entrance volume. She notices some small steps behind each other. She is able to cross them because she is very crafty with her wheelchair (Figure 60). She guesses for persons in an electric wheelchair – who can go up the ramp more easily – these little steps can cause troubles. Another potentially problematic aspect of this entrance volume, is the black carpet on the floor. We can see that moving on the carpet costs her considerable effort (Figure 61). Sofia suggests to divide the floor into two parts: one side covered with carpet, one side with flat finishing. At the end of the entrance box, there is another step to overcome. By indicating these details she wants to demonstrate how such small things can change her impression of a building. When she knows she will have problems leaving the building, she does not feel comfortable at all while visiting the exhibitions.

[14] See 'Approaching the Site', p.52

Figure 60 Small Steps

Figure 61 Black Carpet

To find the ticket office itself, Tiago continues following the wall. Usually persons who prefer the (exterior) elevator and persons walking up the ramp meet again in the entrance hall in front of the ticket office. Although it is also possible to start the exhibition at the bookshop. The ticket office is also situated in the black entrance volume and is part of the renovation of 2006. Sofia really appreciates the difference in height of the ticket office. One side is lower, one side is higher (Figure 62). This is useful for persons with a physical impairment (Figure 63) and of course it contributes to the pro-children policy. In her opinion it is odd that the organisation thinks about such details but not about the entrance.

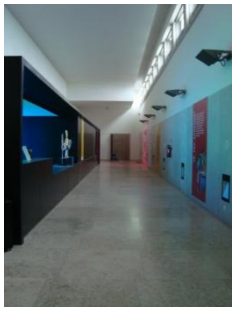

Figure 62 Ticket Office

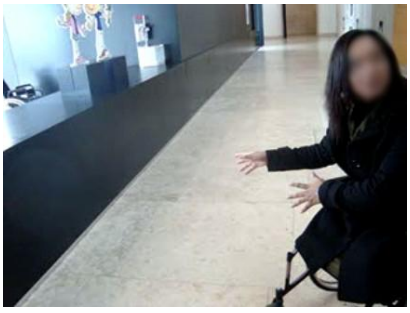

Figure 63 Sofia and the Ticket Office

Tiago comments on the location of the ticket office. Although he is not able to see the ticket office, he regrets that there is no visual relationship between the ticket office and outside. When a taxi driver would drop him off at the entrance, he does not know whether the Pavilion is open or not. He imagines himself going up the ramp. If he were to fall down on top of the ramp, nobody would notice. The accessibility employee says that this interpretation is not completely correct. She admits that there is indeed no visual connection between the reception and outside, but the ramp is closed off for the public by means of a chain during closing time.

BEFORE THE EXHIBITION – "*The Foyer is the space of distribution of the visitors to the different areas of the museum*" (Fonseca 2008).

Coming from the entrance hall the visitors first have to pass through a black corridor[15]. From here onwards the visitors were supposed as if they were inside the

[15] See 'Corridor', p.38

water during the exhibition of Expo '98 (Reis 1998), the exhibition could finally start. The blind user/expert notices that the sound inside this corridor is totally different from that in the entrance hall. At that moment no other visitors are in the corridor but Tiago guesses there is a lot of echo. By clapping with his hands he demonstrates that his assumption is right. The accessibility employee indicates another characteristic of the corridor. For a visually impaired person who used to work in the Pavilion, the corridor served as an orientation point. While walking in front of this corridor she was able to experience a float of air. This corridor thus seems to appeal to visually impaired persons.

The Foyer itself underwent a radical renovation in 2006[16]. The first thing that strikes visitors is the huge size of the two-storey space. Another remarkable feature of the Foyer is the illumination of the space through the new large window. The accessibility employee confides to us that the architect opposed to the new window at first. She thinks the Minister of Science finally convinced him. Eventually the large window was established and it is very much appreciated by the visitors. The wheelchair user/expert likes the view of the entrance (Figure 64) and the natural daylight. The size of the window is positively valued by her; it is at the right height for her (Figure 65). The user/expert with a visual impairment likes the window too. When Tiago comes by taxi, the taxi driver can notice visitors inside during opening hours, so that he is completely sure the Pavilion is open to the public. The accessibility employee says it is possible to peep inside but the view to the inside is not excellent. She thinks it does not function in this way. At the moment of the visit the window was even darkened by a roller-blind because of activities by pupils in the Foyer. Although the window does not function the way he wishes, Tiago appreciates the fact a connection is made between the inside and the outside.

Figure 64 The View

Figure 65 The Height

After traversing the Foyer, visitors have the possibility to enter the exhibition spaces. For Sofia the beginning of the exhibition is very clear. To enter the exhibition visitors have to show their ticket to a machine (Figure 66), afterwards the glazed door opens automatically. The wheelchair user/expert finds the machine easy to handle because the door to the opposite side of you opens (Figure 67). Most of the time the blind user/expert is guided by another person. In our company he also asks to guide him to the ticket office. He would probably be able to find the entrance of the exhibitions

[16] See 'Foyer', p.38

by himself because inside the Foyer he could follow the wall all the way to the ticket machine.

Figure 66 Showing the Ticket

Figure 67 Opening of the Door

CONTENT OF THE EXHIBITION – "*White sheets on which exhibitions would be displayed*" (Fernandes & Cannata 2001).

The museum contains three levels, two of which are open to the public. Visitors enter on the first floor and finally they will end up at ground level to leave the building. "*The succession of spaces of the Pavilion is conceived in this way the public is immediately guided to the first floor*" (Escolano 1998). The architect says they created empty spaces with a height of seven meters each. He compares this designing process to designing a theatre: he was responsible for conceiving the stage, but not for the lighting, decoration, ... During the conception phase he knew the Pavilion would become a museum, but he was not aware of the exact content of it. "*At the end of Expo'98 the building became the stage of the Museum of Science*" (Fonseca 2008).

Nowadays the Pavilion exhibits three permanent and two temporary exhibitions[17]. The curators did not conceive a typical exhibition track; there is no one right order of visiting the exhibitions. For the exhibition of Expo '98 a typical exhibition track had been created: "*The route through the diverse exhibition sectors is a journey and the building is the paralytic ship that transport us*" (Graça Dias 2005). Although there is no typical exhibition track anymore, this quote still applies to the Pavilion. The accessibility employee explains the absence of an exhibition track. The Pavilion contains smaller spaces and sometimes the layout of the building may seem chaotic. However this Pavilion is a space full of activities and does not request a typical track, unlike an art museum, which does require a typical exhibition track in her opinion. To locate the different exhibitions the organisation of the Pavilion marked the way to the exhibition spaces by means of coloured lines on the floor (Figure 68). Tiago says he does not like exhibition tracks in general, he wants to choose himself where he likes to go. In his opinion a guidepath in relief on the floor is not a good option for a museum. Although he is not able to follow the coloured lines on the floor he likes the approach of the exhibitions, in his opinion the layout of the building is clear. Sofia

[17] See 'Exhibitions', p.40

agrees with the clear layout of the building. At the end of the visit, however, Tiago mentions that he is not able to visit the Pavilion on his own because the museum is not designed for disabled persons visiting it on their own.

As the exhibition spaces are spread over two levels, the vertical circulation is part of the visit to the exhibition. Some visitors prefer the interior elevator located in the Nave. Logically the wheelchair user/expert opts for the elevator. Sofia does not have complaints about it, except for its size (Figure 69). Because she is in a small manual wheelchair, she is able to turn inside the elevator. She guesses other wheelchair users may have difficulties moving in and out. The elevator serves only two levels. The numbers are indicated by the numerical value and in Braille. Tiago suggests something else: showing a larger number and in relief. In his opinion this solution would be better for the visibility of persons with low vision or older persons.

Figure 68 Coloured Lines

Figure 69 Interior Elevator

Next to the interior elevator there are two staircases for travelling between the two levels. The accessibility employee mentions that she insisted on putting white lines on the steps for creating more contrast. Unfortunately the management of the museum does not comply with her request yet. The adaptations she wants to make are not just meant for persons with a visual impairment, she says. She wants to create a museum for everyone: the adaptations also serve parents with a baby pram, older persons... (Figure 70).

To enter the temporary exhibition 'Amazona' at ground floor the visitors have to go down a ramp. The accessibility employee mentions this space is fully accessible for visitors in a wheelchair. When Sofia enters the exhibition she already notices she will experience difficulties with leaving this exhibition space by going up the ramp. After visiting this space, she proves to be right: in her opinion the gradient of the ramp is too steep (Figure 71). She makes a striking comment: "*If an exhibition is interesting, the access and exit of the space do not really matter to me. Although if the exhibition is boring or uninteresting, I feel even worse because of the ramp*".

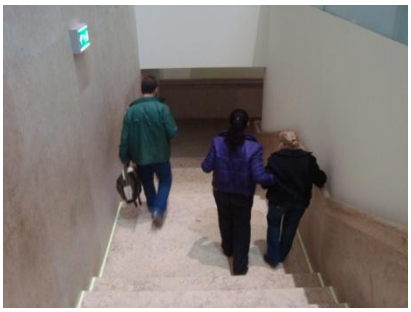

Figure 70 Staircase

Figure 71 Ramp of 'Amazona'

The exhibition spaces are conceived as 'white sheets'. In an interview with Carrilho da Graça he explains this as follows: "*If it's for other people, or even for people we don't know, we have to build extremely simple spaces*" (Pimenta 2011). A first difference Tiago notices between the Nave (Figure 72) and the other exhibitions spaces, is the difference in acoustics and temperature. We first visit 'Explora' and there he mentions this difference for the first time. Many pupils are testing activities while the accessibility employee is explaining something to us. This conversation is almost unintelligible because of the loudness of the children. The accessibility employee points out that there are almost no calm spaces because it is an activity museum. Tiago admits these acoustics would be ideal for a museum with works of art – where you only have to watch and perceive – but for this kind of museum they are rather unsuitable. In the exhibition space of 'Casa Inacabada', white acoustic panels hang from the ceiling and the walls (Figure 73). Despite these precautions the acoustics of this space are almost as bad as those of 'Explora'. The acoustics of 'Amazona' are more or less the same in his opinion, although it is much more quiet here. The exhibition focuses on the visual experience and does not involve testing activities: at the moment of our visit few other visitors are present. The quietness is deceptive in his opinion, he thinks the acoustics of the spaces are the same as the acoustics of the other 'white sheets'.

Figure 72 The Nave

Figure 73 Acoustic Panels in 'Casa Inacabada'

The 'empty stages' of the permanent exhibitions 'Explora' and 'Casa Inacabada' are organised as a garden in which the activities are positioned at random, spread over the whole exhibition space. Sofia appreciates this layout because of the spaciousness. She likes the fact that she immediately has an overview of the space; in this way she knows what to expect. The accessibility employee knows this layout is valued by physically impaired persons, she admits the layout could be difficult for visually impaired visitors. Tiago does not make comments on its layout because he is

guided. The activities of 'Sexo.. e então?!' are placed more closely to each other, grouped per phase. Sometimes Sofia meets with little obstacles - like a small step (Figure 74) - but in general she appreciates this layout too.

Both user/experts are very pleased with the design of the exhibitions 'Explora', 'Casa Inacabada' and 'Sexualidade'. These exhibitions are adapted to children's heights and they seem to be comfortable for the user/experts too. Sofia tests activities of the exhibitions. For example, she tries out an activity with a table; she can smoothly move her wheelchair underneath it (Figure 75). For another activity visitors have to stand up at a distance. Her perception is different than the perception of a standing grown-up, but a child's perception would be similar to hers. A facet they both esteem is the finishing of these activities. Tiago likes the round finishings of the tables of 'Explora', the working surfaces of 'Casa Inacabada', the separation inside the space 'Casa Inacabada' and the separations of 'Sexo.. e então?!'. In this last exhibition sometimes soft material is used in accordance with the subject (Figure 76). He mentions he likes different kinds of materials; the variety offers him an interesting tactile experience.

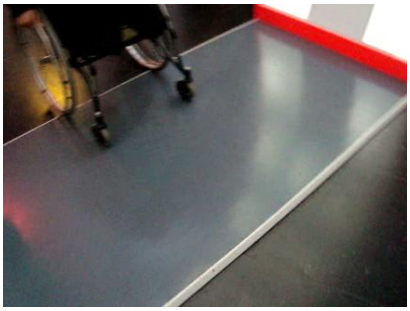

Figure 74 Entrance Sexualidade

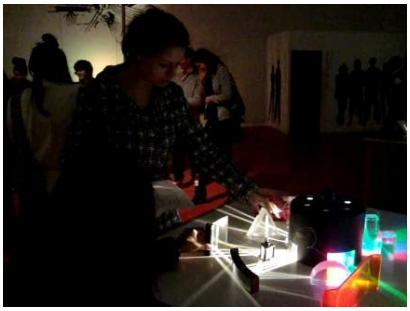

Figure 75 Activity of 'Explora'

The exhibition 'Amazona' is not really directed at children, but is meant to appeal to a wider public. Tiago notices that several objects of this exhibition have sharp edges, totally different from the finishing of the other exhibitions. Experiences in other buildings made him aware that contemporary architecture usually has sharp surfaces. Sofia notices the difference between the exhibitions too. Whereas the previous exhibitions were adapted to her size, she is confronted with more barriers here. Still, the height of the showcase is ideal for her position (Figure 77). In general the design of the exhibition is good, but there is definitively a difference with the exhibitions for children.

Figure 76 Surfaces of 'Sexo.. et então?!'

Figure 77 Showcase of 'Amazona'

Next to the design of the exhibition, the user/experts are also influenced by its content. The exhibition 'Explora' focuses on human perception[18]. The accessibility employee tells us that she does not like to visit this exhibition in the company of a group of visually impaired persons. Especially in the beginning of a guided tour it is not a good idea to bring them here, because they are immediately confronted with their impairment. When the visually impaired visitors are interested in this subject, she does not make a problem of it. The activities of the Pavilion invite touching, a quality which persons with a visual impairment really appreciate. The Pavilion is frequently visited by groups of students and sometimes including one with a visual impairment. The accessibility employee advises this student to experience the activities in the company of his/her classmates. Through the classmates (s)he will indirectly receive a lot of information about the exhibitions. The exhibitions of 'Casa Inacabada' are actually created for small children, but older persons seem to enjoy the activities too. The exhibition of 'Sexo.. e então?!' is intended for youngsters between 9 and 14 years of age but is interesting for a wide range of visitors (Figure 78). The accessibility employee is aware of the fact that the exhibition 'Amazona' is visually oriented. She thinks it is not so interesting for visually impaired persons. Nevertheless some efforts have been made to make the exhibition attractive for a wide range of visitors. Two movies are being showed. The first one is very visual: she thinks it is very interesting for auditorily impaired persons. The second movie tells a story which is translated into sign language. The accessibility employee intended to remove the glass of the showcase. Unfortunately this was not allowed by the management because the objects are too precious. Another effort she wants to make for visually impaired persons is a book with simplified drawings in relief about the exhibition (Figure 79). As the exhibition will end soon, this book will not be realised. With these attempts she wants to make the exhibitions interesting for all kinds of visitors.

Figure 78 Activity of 'Sexo.. e então?!'

Figure 79 Drawing of 'Amazona'

The issues mentioned in these last paragraphs are not the responsibility of the architect. Nevertheless, they need to be mentioned because they influence the impression of the user/experts. The users do not distinguish the movable and immovable characteristics of a building.

[18] See 'Explora', p.41

CENTRAL SPACE OF THE BUILDING – "*The ship is the central area*" (Perrault 2000).

The Nave (or in English: Ship) is the central area of the Pavilion. All the exhibition spaces are connected to this central space. The architect says that this space is more or less 35 meters tall. The professional literature is more exact about the dimensions of the volume: "*The space is huge: a floor plan of 60 m x 16 m and a height of 40 m*" (Reis 1998). It is the vertical volume of the Pavilion which together with the horizontal volume forms a megalithic cross (Figure 80). The literature mentions: "*It basically consists of a vertical tower (..) and of a horizontal block split by an access patio*" (Ferreira *et al.* 1996). The immensity of these volumes really has a particular function: *"(..) with the vertical parallelepiped being able to exhibit large elements*" (Ferreira *et al.* 1996) (Figure 81). During Expo '98 it served for displaying pieces of a ship: "*The large room contained in the pavilion's vertical volume creates a spectacular centre-point, where allusion of shipyard is made by structures resembling naval architecture, and where natural light entering from high above introduces the reality of Nature's elements*" (Toussaint 1999).

Figure 80 Effect from the Outside

Figure 81 Effect from the Inside

The ground level of the Nave contains a temporary exhibition: at the time of our visit it is the exhibition 'Sexo.. e então?!'. The first level of the Nave serves as a mere circulation area. The coloured lines on the floor attract the visitor's attention. A banister protects the visitor from falling down. The accessibility employee brings this banister to our attention. She does not understand why one side of the banister is made of transparent glass and the other side of translucent glass (Figure 82). Visitors coming from the Foyer are faced with the latter. In her opinion one of the qualities of this tall space is that it gives an overview of the temporary exhibition on the ground floor. Regrettably children, persons small in stature and wheelchair users do not have the opportunity to enjoy the overview. Coming from the Foyer, Sofia first faces the translucent banister (Figure 83). At the other side of the Nave she notices the transparent banisters and over there she is able to look downstairs. In her opinion it is not really a problem that the translucent character of the glass is only limited to one side, at the other sides she is able to perceive what is going on on the ground floor. However, she does not understand why the side of the Foyer needs to be translucent because this side gives the first impression of the exhibition spaces to the visitors. When the architect is asked about this issue he does not remember why they created a distinction. It must have had an architectural reason, he thinks, but he understands the difficulties certain visitors withface.

Figure 82 Translucent and Transparent Glass

Figure 83 Translucent Glass

Tiago asks for our guidance inside the Foyer. In the Nave, by contrast, he wants to walk on his own. Here he has the possibility to follow the banister with his hand. Suddenly he feels an interruption of the banister, he wonders what this is. We explain to him it is a door for an activity of riding a bike in the air (Figure 84). He likes to follow a banister, it serves as a guide to him.

Tiago notices other characteristics of the tall space. When he enters it after visiting the exhibitions 'Explora' and 'Casa Inacabada' he notices that this space feels more cool than the other exhibition spaces, he wonders why it is. The size of the Nave may explain this drop in temperature. The acoustics of this large space are totally different than those in the previous exhibition spaces. Because of the change in acoustic and thermal conditions he notices that he enters the Nave.

Next to the acoustic and thermal effects the space has a particular visual effect too. "*The interior's zenith illumination dramatically accentuates the high ceilings*" (Toussaint 1999). Through the light effects the tallness of the space is emphasized: "*It is in this area that, maybe in a more evident way, we feel the scale of the building is hard to define*" (Fernandes & Cannata 2001). During Expo '98 this space provided a particular feeling to the visitor: "*It is the confrontation between the man and his relatively unimportant scale comparing to the largeness of the sea*" (Reis 1998).

During our interview the architect tells us that he is not satisfied anymore with the Nave. During Expo '98 the space suited its content, a ship in a ship (Reis 1998) (Figure 85). Nowadays the bigness of the Nave is not fitting anymore. He confides us that they are thinking about placing smaller exhibition volumes at different heights inside the Nave.

Figure 84 Bike in the Air

Figure 85 Ship in a Ship

LIGHTING – "*Above all, the empty spaces do not have natural lighting*" (Perrault 2000).

During the interview the architect mentions that the organisation explicitly demanded to avoid having natural daylight inside the exhibition spaces. To meet these requirements they have created empty spaces with a height of seven meters each[19]. To provide artificial light inside the exhibition spaces a technical floor with a thickness of 80 à 90 centimetres was built. This technical floor is constituted of squares of one meter by one meter and also offers place to heating, ventilation and electricity. The accessibility employee tells us that the electricity can easily be adapted because of this standard dimension. In a magazine this technical option is confirmed: "*In the present situation, we concentrated all systems underneath the stage: a modulate wooden flooring, very easy to access, that supplies all that is needed. Since the rooms are very high but the users are always near the floor, the air conditioning is placed there. The performance of electrical and security installations, electronic systems, sound, etc., are always better if on the floor, since all the objects and exhibition devices somehow rest or touch it. This concealed technical floor is fed from power stations both over and underneath the floor. It keeps the walls and ceilings naked, completely free of electric, electronic or lighting 'gadgets' "* (Perrault 2000).

The only spaces of the museum where sunlight is allowed to penetrate, are the entrance hall and the Nave. In the entrance hall there is natural daylight because of the glass volume introduced during the renovation. Before the renovations, natural daylight penetrated the entrance hall as well: "*We have natural lighting only in the entrance room*" (Fernandes & Cannata 2001). The exhibition spaces do not have daylight: "*The remaining windows are shut during exhibitions*" (Fernandes & Cannata 2001). About these exhibitions spaces a comment is made: *"(..) using zenithal lighting and the absence of windows to the interior to create a very favourable atmosphere for exhibitions*" (Ferreira *et al.* 1996). In the Nave the daylight penetrates the building zenithally: "*Light is zenithal, with top-lights facing east*" (Fernandes & Cannata 2001). Since the renovations in 2006 the Pavilion has a new window, the large window in the Foyer[20].

None of the user/experts makes a comment on the lighting. The accessibility employee and the architect not do so either. Except for the windows of the entrance hall, Nave and Foyer no natural daylight enters the building, but apparently the user/experts are pleased with it. In the professional literature we read a positive comment on the lighting: "*Actually exhibitions are displayed with artificial lighting that outlines and illuminates objects*" (Fernandes & Cannata 2001).

[19] See 'Content of the Exhibition', p.60

[20] See 'Before the Exhibition', p.58

3.2 Museum M – Louvain

3.2.1 General Information

3.2.1.1 Urban Context

The Origin of the Museum

As De Rynck (2009) describes in the biography about Museum M that the origin of the museum dates back from the 18th century. Like many municipal museums, the museum started as a collection of curiosities of that period. The collection was gathered on the second floor of the City Hall of Louvain.

Around 1800 a lot was changed by the French government. The churches, the convents and universities were obliged to bring their art collections to a central depot. After the pieces were collected in the depot, they were transported to France. The central depot for the surroundings of Louvain, Aarschot, Tienen and Diest was situated in Louvain. Nevertheless, some of the works never reached France.

During the 19th century the collection grew extensively. The collection is still stored on the second floor of the City Hall but is now named 'Museum of Paintings'. The collection is replenished by the work of Edward Van Even, the first person to be responsible for the museum. During his term of office he purchased some masterpieces but the museum also received some donations of art. The museum was not a museum as we know now: but all the walls were entirely covered with pieces and there was not a single explanation accompanying the works of art.

In the beginning of the 20th century the collection was again enlarged. This time with the work of the first conservator of the museum, Victor Demunter.

In 1917 Victor Vander Kelen donated his parental home in the *Savoyestraat* to the city to house the municipal museum (Pelgrims & Winnen 2004). This solution was ideal for the potential extension of the collection because of the growing lack of space in the City Hall (De Rynck 2009). But very quickly the house became too small for the still growing collection of the museum. The extension of the museum was managed by Victor Demunter.

In 1930, the secretary of the city donated some modern works of well-known painters such as Constantin Meunier and Pieter-Joseph Verhaghen. Victor Demunter put considerable effort into the museum during his lifetime. When he died he donated his collection to the Vander Kelen – Mertens Museum.

During World War II, the museum was closed. The collection of the museum was stored in the safes of the National Bank of Belgium. The building was damaged in the attacks of 1944 but the museum reopened in 1946.

After the reopening Jan Crab, the first conservator of the city, wanted to transform the building into a modern museum. This means he covered the sphere of the mansion and he changed the way of presenting works of art. The walls were no longer fully covered; but only the most beautiful objects of the collection were shown in the museum.

In 1972 'The Friends of the Municipal Museums of Louvain' were re-established (from 1930 till 1938 this group also existed for a while). The members of this association helped the conservator Jan Crab to make inventories, to prepare exhibitions and to organize activities for the members.

During the 1980s the museum presented its most important collections: late gothic paintings and statues from the 15th and the beginning of the 16th century (Figure 86) and the art from the 19th century (Figure 87). Because of the retirement of the conservator Jan Crab in 1981, the museum started to pay attention again to the context and the collection of the museum.

Figure 86 Rogier van der Weyden

Figure 87 Constantier Meunier

In 1998 Veronique Vandekerckhove was appointed the new conservator of the museum. With this appointment a new period in the history of the Museum Vander Kelen – Mertens is started…

The New Museum Site

For years the museum collected several masterpieces including sculptures, paintings, drawings and archaeological relics (Slessor 2010). In 2000, the museum possessed no less than 46000 objects. Although it is positive to have an extended collection, there were also some problems. There was a lack of space to show and to store all the valuable pieces. The museum itself was a mixture of different architectural styles and there was no homogeneity in the location.

The transformation from 'Museum' to 'Museum site' started by the moving of the City Library to the building 'Tweebronnen' in the Diestsestraat in 2000 (Pelgrims & Winnen 2006). In this year Sjarel Ex, at that time director of the Gemeentelijke Musea Utrecht, was asked to give advice about the development of the Museum site (Stad en Architectuur 2006). The four most important issues of his advice were the

following: to build a depot for the pieces, to educate an appropriate staff for the museum, to investigate the collection and to transform the current architecture.

In 2001 Jan Hoet, Jan Braet and some employees of the S.M.A.K. (Stedelijk Museum voor Actuele Kunst) made a study of the current Museum site (Stad en Architectuur 2006). In this study they already developed some interesting concepts. They stressed the fact of *'ambiente'* and already focused on two ideas: creating and preserving (Pelgrims & Winnen 2006). The model of the chamber was also advanced by this workgroup .

During 2002 the ideas put forward by Jan Hoet and others became more specified. The concept 'unlocking' was added to the two other concepts of 'creating' and 'preserving' (Pelgrims & Winnen 2006). In this period also some main aspects were emphasized. One aspect is that the site has to be dynamic. In this context the slogan of Louvain "*centuries-old but alive and kicking*" is relevant (Pelgrims & Winnen 2006). There has to be a balance between past and present. Moreover, the relationship between the local and the international level has to be stressed by the museum.

Until now only some general concepts were defined. '*Werkplaats voor Architectuur*' (WVA), an architecture office in Louvain, was appointed to translate the concepts to a concrete program of demands (Pelgrims & Winnen 2006). By defining all the desirable spaces they concluded they needed an area of 13 500 m^2 (Stad en Architectuur 2006), while the actual Museum site was only 5 725 m^2. They also made an evaluation of the existing buildings: protected monuments, historically valuable buildings, valuable elements and constructions to eliminate. By the end of 2003 a final report was composed, which was the key basis for the further development of the site.

At the end of 2003 a new initiative was staged. It was called '*Collectie in de Steigers*' and was important for two main reasons (Cosemans 2005). Successively Medieval, 19th century and neo-gothic objects were presented in three exhibitions. These exhibitions were open to the public to show the collection. By means of these exhibitions the staff of the museum also had the opportunity to rediscover all the pieces and make a selection for the semi permanent collection of the museum.

In 2004 the City of Louvain held a competition for the redevelopment of the Museum site (Pelgrims & Winnen 2006). The city placed an announcement in the Belgian Bulletin of Acts. 23 teams responded the appeal. A panel selected five teams to make a first draft for the site (Stad en Architectuur 2006). The selected teams were Neutelings Riedijk (Rotterdam), De Smet Vermeulen (Ghent), Robbrecht en Daem (Ghent), Driesen Meersman Thomaes (Antwerp) and Stéphane Beel (Ghent). The latter was the winner of the competition (Pelgrims & Winnen 2005). Especially his interpretation of the model of chamber created by Jan Hoet was appreciated very much (Figure 88).

In the spring of 2005 Stéphane Beel was occupied with the execution of his proposal for the Museum site (Pelgrims & Winnen 2006). In the beginning of 2006 he presented his definitive project (Figure 89). The collection was transported from the museum to the Vaartkom. On the 30th April of the same year the Museum Vander Kelen – Mertens was definitively closed for the public. The realization of Museum M would take three years.

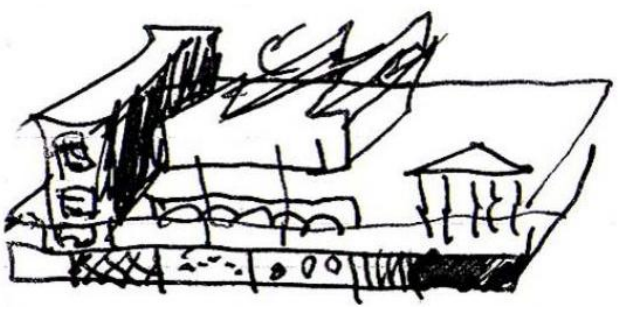

Figure 88 Sketch

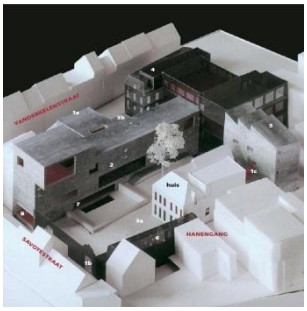

Figure 89 Model

As mentioned by Van Steenkiste (2007) the new name of the Museum site will be 'M'. The previous name of the museum was '*Stedelijk Museum Vander Kelen-Mertens*'. This was not very easy to remember and the people did not know anymore where it came from (Van Der Speeten 2007). The new name 'M' is short but powerful. M has the same sound in every language and is not sensitive to changes of trends. In contrast to the old name 'M' is easy to recognize and to remember.

On 20 September of 2009, Museum M was finally opened by the Belgian Princess Mathilde and the Dutch Princess Maxima (Van Beek 2009) with the famous exhibition about the Artist Rogier van der Weyden (Rinckhout 2009).

Location and Transport

The *Bondgenotenlaan* connects the railway station with the city centre (Ballhausen 2009). The city centre is consists of the *Grote Markt* and the *Oude Markt*. The *Grote Markt* is known because of the gothic City Hall and the Sint Pieters Church.
Before arriving in the touristic city centre and on the way to *Ladeuzeplein*, the *Vanderkelenstraat* crosses the *Bondgenotenlaan*. Here, Museum M is located (Ballhausen 2009). It is situated between three streets: *Vanderkelenstraat*, *Savoyestraat* and *Hanengang* (Figure 90). It is possible to enter M from each of these streets. The different entrances make a connection with the city.

Each entrance gives access to a specific space of M (ECL 2008). The main entrance of the site is situated in the *Vanderkelenstraat*. An outstanding characteristic of this entrance is the protected fronton. Because a fronton with columns is an international sign for museums, the main entrance is evident for the public. Another entrance is located in the *Savoyestraat*. By entering through this entrance, the visitor arrives in the public garden of M. The last entrance is situated in the *Hanengang*. This entrance is more private and only accessible for people with permission.

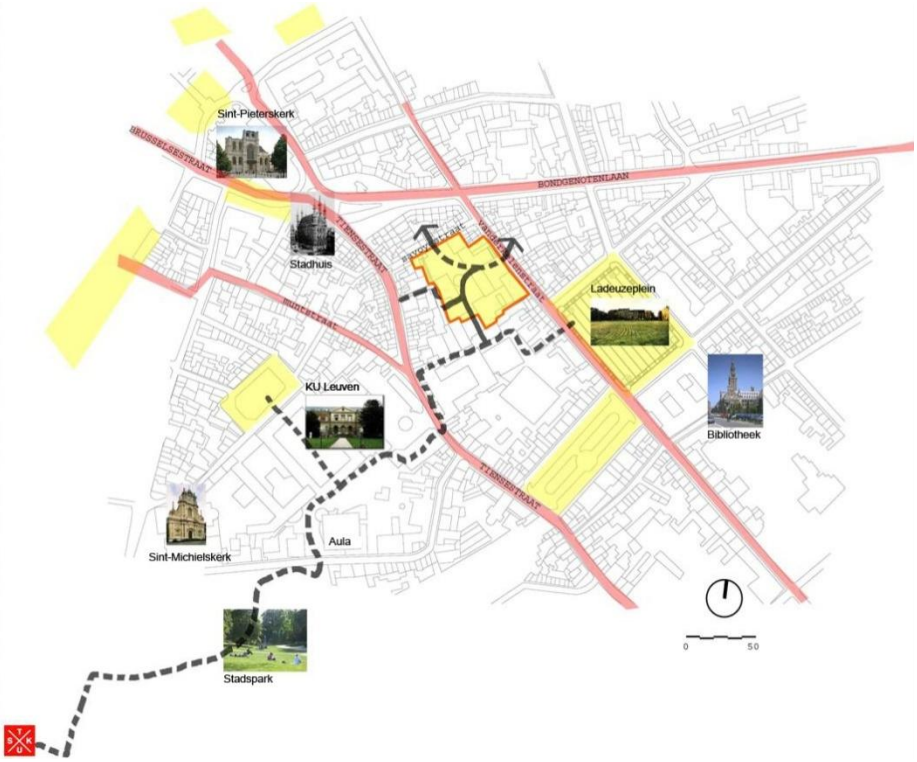

Figure 90 Situation

To reach Museum M you have different possibilities:

First of all you can come by car. The highways E40 and E314 have slopes in Louvain. To park your car you have to drive to one of the city's parking lots (interview architecture guide 2011). The closest (paying) one is Parking Ladeuze, underneath the *Ladeuzeplein*. Other car parks in the neighbourhood are Parking De Bond, Parking Kinepolis and Parking Centre. The City of Louvain wants to expel most of the cars out from the centre. This is the reason the museum itself does not have a private parking lot.

You can also reach M by public transport. The railway station is located at the beginning of the *Bondgenotenlaan*, it is more or less 10 minutes by foot. Buses drive very regularly between the railway station and the bus stop *Bondgenotenlaan*. If you stop here, it is less than 5 minutes on foot. At the moment, the bus stop *Bondgenotenlaan* is not serviced because there are works in progress at the *Maarschalk Fochplein*.

It is also possible to come by bike. In the city centre you have to mind the many one-way streets and the streets where no cars or bikes are allowed. Museum M does not provide a particular parking place for bikes. But you can leave them close to the parking for bikes on the *Ladeuzeplein* or just leave them in the streets around to M.
Of course you can also come on foot. This is very pleasant because a lot of streets in Louvain do not allow bikes or cars during daytime. Recently the city has placed some new signalisation for Museum M.

3.2.1.2 Architectural Concept

The design of the Museum site was a conscious choice between the conservation and the restoration of valuable buildings, the demolition of miserable constructions and the addition of new volumes. Interesting buildings such as the house Vander Kelen – Mertens and the former academy remained (Figure 91), while the old City Library, for example, disappeared (WVA 2003). At the same time Beel added two new volumes (Figure 92): a long volume parallel to the *Vanderkelenstraat* and a tall volume close to the *Hanengang* (T'Jonck 2005). By eliminating old volumes and adding two new ones, he succeeded in unravelling the previous chaos of the site (Pelgrims & Winnen 2005).

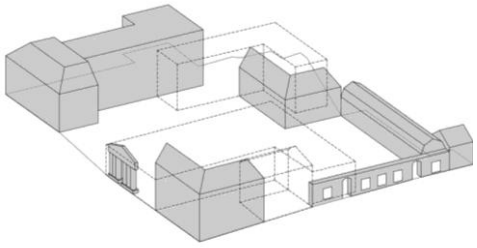

Figure 91 Original Site Lay-out

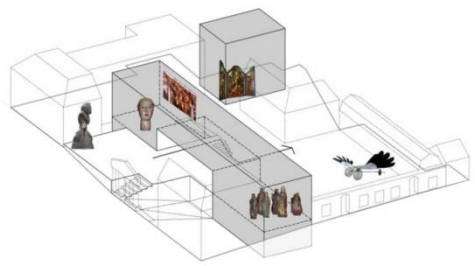

Figure 92 New Site Lay-out

Numerous informal little passages are typical for Louvain (De Rynck 2009), for example the one in the faculty of Economics close to the park. By placing the different volumes in the way they are placed right know, various passages are created to enter the site (Figure 93). There are also different possible ways to enter M (Figure 94): an urban, a cosy or an informal entrance (Beel 2009). The main entrance (urban) is the one in the *Vanderkelenstraat*. This entrance can be distinguished by the protected fronton and the columns. A second entrance (cosy) is situated in the *Savoyestraat*. When entering here you are immediately in the garden. The last entrance (informal) is located in the *Hanengang* but is more private, as it is only accessible for artists and people who are participating in a workshop. The three entrances cross each other in the public garden; the old oak tree dating from 1930 forms the central element (Stad en Architectuur 2006).

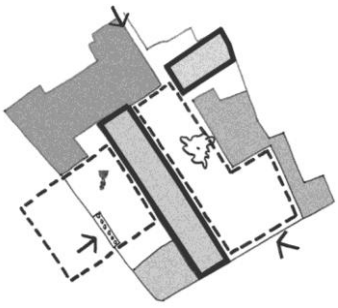

Figure 93 Open and Closed

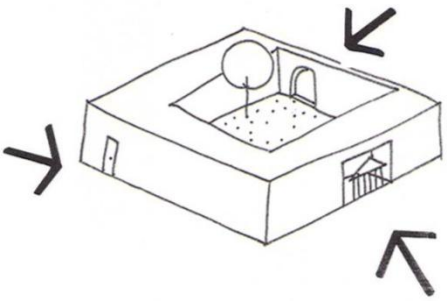

Figure 94 Three Entrances

Jan Hoet suggested the model of chambers. Stéphane Beel interpretes this model very well (Figure 95): he considers the public garden as a municipal chamber, the buildings are the furniture (De Rynck 2009). But Beel applies this model to a higher level as well. He regards M as a chamber in the city, the city becomes a house. In this model the open spaces of the city are the chambers, foot paths become corridors. Museum M is composed of chambers, but is also a chamber itself in the city.

Figure 95 Chamber in the City

Museum M constitutes a part of the city (De Rynck 2009). The architect made well-considered openings in the travertine walls to show the visitors and some works of art to the people outside. By this interaction a passer-by becomes curious about what is inside. The new elements, mainly the two tall volumes, make the site more clear and visible.

It also works the other way round: the city is part of the museum because the content of the museum is about Louvain and its history (De Rynck 2009). This is the reason why inside the building the visitor often gets spectacular views of the city. Beside the views to the city, the visitor also has views to the public garden with the oak tree. By means of these views the visitor can orientate himself. The idea behind these windows is that the person who visits M is guided from one spot of light to another. An interesting interaction comes into being between the museum and the city. It is out of the question that the visitors would forget they are in Louvain.

The Museum site is a balanced composition of old and new volumes. They are well positioned in relation to each other. Even the use of the materials indicates the volumes: the little red bricks of the old Académie contrast with the large white travertine of the new volumes (interview architecture guide 2011). As was mentioned above, the architect placed two new volumes on the site. On well-considered places these volumes are extended (Figure 96). *"A new volume close to the entrance, for instance, cantilevers out but does not touch the portico, it is like an architectural air kiss"* (Slessor 2010).

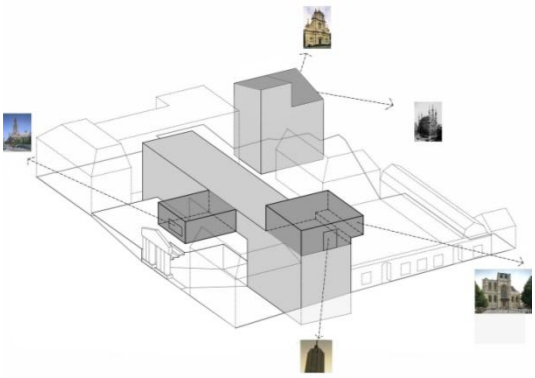

Figure 96 Presence in the City

Inside the building the program is divided in different layers (Figure 97). Beel choose to extend the layer of the basement (Beel 2009). The depot is situated in the two levels of the basement; in this way the depot is feeding the layers on top (Figure 98). On the three other levels the different exhibitions of the museum are located. Each type of exhibition is located on one level but actually they can switch between themselves. The three levels are conceived for every type of art (interview architect 2011).

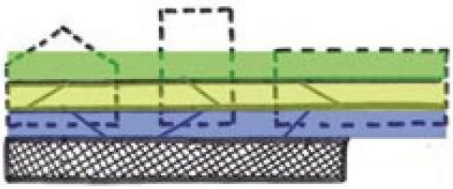

Figure 97 Preserving, Unlocking and Creating

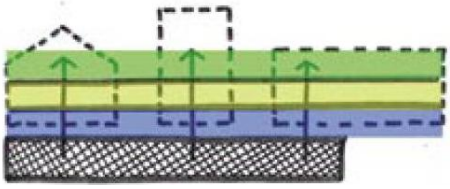

Figure 98 Depot

Walking through the museum is experiencing a succession of different spheres (Liefooghe 2010). Sometimes volumes are consciously built against each other, most of the time they do not touch. To let the visitor think about this transition between old and new the architects made some small bridges between the various volumes. It is a very technical solution, a building can be eliminated when it is not satisfying anymore (interview architect 2011). The concept of these bridges makes the visitors realize they are going from an old to a new volume or from a new to an old volume.

For the given reason the three concepts, developed during 2001 and 2002 - preserving, unlocking and creating - are not placed in one type of typology. Every concept is spread over one layer (Beel 2009). In every part of the building old or new art can be situated (Stad Leuven 2009d). It is possible to find temporary art in old spaces, but it is also possible to discover classic art in a new space. The proverb of Louvain "*centuries-old but alive and kicking*" is suitable: it is true for the collection of M as well as for its architecture (De Rynck 2009).

3.2.1.3 Programme

The programme of demands is portrayed in the final report by the *Werkplaats voor Architectuur* at the end of 2003 (WVA 2003). This study is the basis for the development of the project. First the City of Louvain defined its desires about the site; afterwards these demands were complemented with a comprehensive analysis of the site, providing information about the potential spatial, technical and financial development. A conceptual section with exhibition track is shown in Figure 99. The plan of the ground floor is displayed in Figure 126. For additional plans and sections see Appendix B.

On the 17th of July 1975 a Flemish law was adopted concerning the accessibility of public buildings for disabled people. In 2003 a federal law was laid down about discrimination, including discrimination against persons with a disability. Since the first of March 2010 finally a new Flemish law about accessibility has been adopted.

Museum M opened in September 2009, almost one year before the law became effective. The architect told us they are not obliged to perform conform to the new laws: the laws during the conception phase are the standard. But still we can see to what extent the architect anticipated this new legislation.

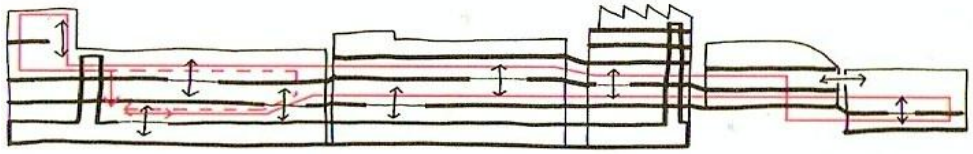

Figure 99 Exhibition Track

ARRIVAL

As already mentioned in the previous parts, the Museum site has three public entrances.

The main entrance is situated in the *Vanderkelenstraat* (Pelgrims & Winnen 2006). This entrance is marked by the protected fronton with columns (Figure 100). Here the visitor can choose between going down or going up (Figure 101). When you go down by the lazy stairs and the swinging ramp, you enter the Antichambre[21]. When you go up, you arrive at a public terrace[22]. Special attention is paid to the way to the Antichambre. Stairs and a ramp cross each other. The architect thought it is very important that the different groups of visitors (for example a person in a wheelchair and an able-bodied person) do not have to separate, they can enter together (interview architect 2011). Having arrived here you can access an entrance volume with automatic doors where you have to take a bend to the right. By this main entrance you enter the Antichambre.

[21] See 'Entrance hall/Antichambre', p.77

[22] See 'Terrace', p.82

Figure 100 Fronton

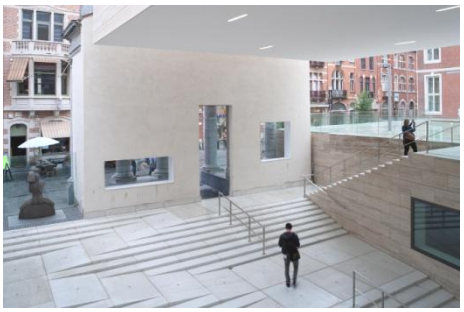

Figure 101 Ramp and Stairs

Another entrance is located in the *Savoyestraat* (Pelgrims & Winnen 2006). By entering here, the visitor immediately is in the public garden. To go to the building you can take a ramp or a short steep staircase. These are totally different from the stairs and the ramp at the main entrance. From the public garden you arrive at the Antichambre by going through an entrance volume with two doors you have to push.

The third entrance in the *Hanengang* is more private; it is only accessible by people who have permission (Pelgrims & Winnen 2006).

All the entrances for the public meet in the garden. The central point of the garden is an old oak tree (Pelgrims & Winnen 2006).

There is another entrance, but this one is not public at all (Stad en Architectuur 2006). It is the entrance for the staff of the museum. This entrance is located in the *Vanderkelenstraat* and you immediately are in the Académie building.

ENTRANCE HALL/ ANTICHAMBRE

The entrance hall is the transition between the street and the actual Museum M. This level is called -1 but actually the level is -0,5. The architect thought it is very important to have an easily accessible entrance[23]. Usually when entering a museum, you have to go up (Liefooghe 2010). The British Museum in London is an excellent example of a typical 19th century museum entrance (interview architecture guide 2011). Nowadays museums are more open to the public, like for example Pompidou Centre in Paris. The same concept is used here; you have to go down to enter M. In this way the entrance should be very accessible and open to the public. This Antichambre has to seduce people to visit the museum.

Because it is situated partly underground and the architects did not want to cut down the daylight, some patio's were created (interview architect 2011). There is one at the children's workshop and one next to the entrance. More light can enter this level by the windows on the side of the garden and through the cafeteria. On the roof of this levels an additional attic window is placed.

[23] See 'Arrival', p.76

This is the central place of the building and it is fully accessible for everyone during the opening hours of the museum. From here you can acces the bookshop or the café. The entrance hall also gives access to the children's workshop and the central garden. This space sometimes is used for receptions and temporary exhibitions (Figure 102) (interview architecture guide 2011). Of course also the ticket office is situated here as well (Figure 103). Nowadays it is situated close to the bookshop; before it was situated close to the flight of stairs. But there is still some discussion about changing the place of the ticket office (interview architect 2011). To enter the exhibition you have to climb the stairs or take the elevator close to the children's workshop.

Figure 102 Temporary Exhibition

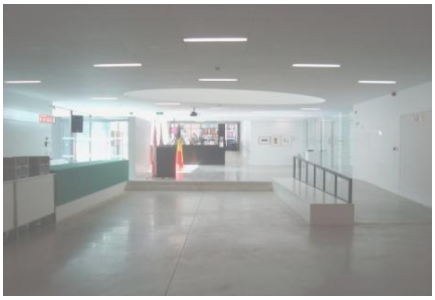
Figure 103 Ticket Office

AUDITORIUM

A part of the Antichambre is reserved for an auditorium. This space is not like a typical auditorium, it is a multi-purpose space (Liefooghe 2010). The employees of the museum call it the 'Forum'. Sometimes the auditorium also serves as an exhibition space (Figure 104) or very often as a room for presentations (interview architecture guide 2011). When the chairs (Figure 105) are not needed they can easily be stored in the closets along the wall. Because most of the time a large number of people are gathered in this space, some acoustic measures have been taken: carpet on the ground, curtains, acoustic plaster and acoustic panels (interview architect 2011). To bring more daylight into the auditorium a special attic window is placed on the terrace. Since the auditorium is used very often for powerpoint presentations the function of the attic window is not totally clear (interview architecture guide 2011).

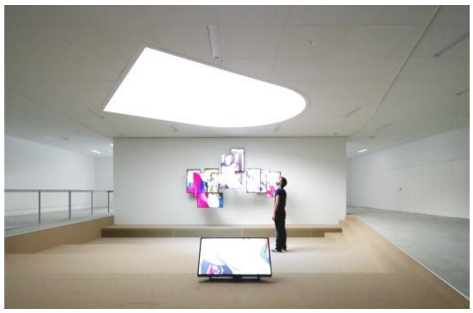
Figure 104 Auditorium Without Chairs


Figure 105 Auditorium With Chairs

CHILDREN'S WORKSHOP

This space is situated in the new tall volume, called 'small tower'. This atelier (Figure 106) is accessible through the Antichambre but also through the entrance at the *Hanengang*. The children's workshop was meant to be visible from the Antichambre but nowadays the staff of the museum have shielded the space (interview architect 2011). From the exhibition space on the ground floor (space 6) you will have a view into the workshop space. A large painting is placed against the two-storey wall of the workshop space. People who are visiting the exhibition suddenly get a view on the painting in this space.

The children's workshop has its own patio. In this way the workshop and the Antichambre have natural daylight and the children can also play outside (interview architect 2011).

GARDEN

This garden is not totally designed by Stéphane Beel himself. This central space was already a garden for some time (interview architecture guide 2011). Underneath the garden an archaeological site is situated and Beel was not allowed to touch the hidden objects. He opted for keeping the garden as the central space of the Museum site; an intimate garden for the museum (Figure 107).

This space is the meeting point of the three different entrances. In the middle of the garden the old oak tree is still standing (Pelgrims & Winnen 2006). You can reach the garden via the main entrance or directly through the entrance at the *Savoyestraat*. Ramps and little stairs are provided, making the garden accessible from the Antichambre. In this way the garden is also accessible to people with a physical disability.

By visiting the exhibitions inside the building you often have a view on the garden and the tree. This should stimulate your orientation inside the building (Beel 2009).

Figure 106 Children's Workshop

Figure 107 Garden

DEPOT

For the former Vander Kelen – Mertens Museum the depot was situated in the City Hall, now the depot is a fundamental part of the Museum site (De Rynck 2009). The

depot is not only the conceptual breeding ground of the museum, it is also literally situated underneath the museum (Pelgrims & Winnen 2006). The previous basement was extended and the depot is now situated in here, namely on level -2 and -3. In this way the depot can 'feed' the higher levels. By means of the elevators, the pieces can be moved from the depot to an exhibition floor and the other way round.

It was the intention to have to sneak previews from the *Vanderkelenstraat* and from the Antichambre (Pelgrims & Winnen 2006). Because of some preconditions of the site this has not been realised entirely (interview architect 2011). There is a space on -2 which was intended to display some art of the depot, but nowadays it is used as a room for seminaries. This space has two windows, one from the auditorium and one from the entrance with the stairs and ramp. In normal conditions people can have a look into this space and what is happening here. Because it was necessary to darken to room for the last project, the windows are now blacked out. The sneak previews as they were meant to be, are not established (interview architecture guide 2011).

LIBRARY AND OFFICE

The library, the offices and the conference rooms of the staff are situated in the previous Académie building in the *Vanderkelenstraat* (Pelgrims & Winnen 2006). This building underwent a thorough restoration and an elevator was placed to make it more accessible. The monumental staircase of the former Académie was conserved and it is sometimes used for transferring large pieces of art to the exhibition spaces (interview architecture guide 2011). A large part of the exhibition is situated in the old Académie as well.

GROUND FLOOR: GALLERY

The exhibition starts on the ground floor. The exhibition is situated and spread over different levels. As already mentioned above, the three concepts 'preserving, unlocking and creating' are each placed on one level[24]. Here the concept 'preserving' is dominant. This is the reason why on this floor the semi permanent collection is shown. The main topics of this exhibition are the late gothic paintings and sculptures from the 15th and 16th century and pieces from the 19th century (M Museum Leuven 2009).

Space 1 (long volume): By taking the central staircase in the Antichambre you enter the exhibition. This is the first space of the exhibition track, *i.e.* 'Sculptures and Carvings from Brabant'. The subject of this space is the gothic period (Figure 108). A part of this space is two stories high, a connection is made to space 23 on the first floor.
Space 2 (Académie): From here onwards you are in the Académie building. This is the only place in the building where the transition between an old and a new volume

[24] See 'Architectural Concept', p.73

is not marked (interview architect 2011). This long corridor is dark and is called 'Precious Survivors'. At the end of the corridor there is a private door with access to the offices of the staff.
Space 3 (Académie): This space is also a room of the previous Académie. Here the paintings 'From Gothic to Renaissance' are shown. Some walls are painted blue nowadays. There are also some windows in this space but the designer of the exhibition choose to black them out.
Space 4 (Adacémie): In this long corridor 'Louvain Faces', portraits of famous people from Louvain are displayed (Figure 109). At one end of the corridor a tall window gives a view to the garden. At the other end an old flight of stairs is situated. These stairs also appears on the other levels of the Académie.
Space 5 (Académie): This large space includes works by Constantin Meunier. The name of this space is 'Constantin Meunier', called after him. It is said that Constantin Meunier himself taught his pupils to draw and paint in this room of the Académie (interview architecture guide 2011).


Figure 108 Space 1


Figure 109 Space 4

To get from space 5 to space 6, the visitor has to cross a small bridge (Figure 116). From now on you are in a new volume, namely the small tower. The architects created these little bridges to make the visitors conscious of the transition between old and new volumes of the Museum site (interview architect 2011).

Space 6 (small tower): This space is called 'Bourgeois Ostentation' and painted blue. In the corner of this space an inner window is placed which gives a view onto a large painting in the children's workshop.

After visiting the small tower you will walk to the Vander Kelen – Mertens house. The transition is also made by a small bridge (Figure 117). Here the ramp even enters the house. From this room onwards, the atmosphere is totally different than the one in the previous rooms.

Space 7 (Vander Kelen): This is a space with a wooden floor and in which some books are displayed under glass. The name of this space is 'A Romantic Cabinet'.
Space 12 (Vander Kelen): This room is situated next to the former front door of the house. Because the family were well-known wine merchants in Louvain, the house was adapted to this use. Space 12 used to be the office of major Vander Kelen (interview architecture guide 2011).

Space 11 (Vander Kelen): The space is located at the other side of the former front door (interview architecture guide 2011). Spaces 11, 8, 9 and 10 (in this order) respectively were the drawing and the dining rooms. In these restored spaces sometimes parties were organized to let the customers taste the various wines. Space 11 is very typical because of the green silk against the walls (Figure 110).
Space 8 (Vander Kelen): Space 8 is notable for the bright red of the walls.
Space 9 (Vander Kelen): The walls of this space are covered with blue and gold painted leather (Figure 111). The use of leather is very exceptional and extremely expensive (interview architecture guide 2011). It is also used in the Rubenshouse in Antwerp.
Space 10 (Vander Kelen): In contrast to the other rooms of the Vander Kelen house where everything is fully restored, in this space only the ceiling is conserved (interview architecture guide 2011). The space is called 'Porcelain'.


Figure 110 Space 11


Figure 111 Space 9

Space 10 is the last exhibition space of the ground floor. If you want to go to the next floor you have to leave the Vander Kelen house by space 8 and take the old stairs right in front of you. This flight of stairs is also original from the 19th century.

TERRACE

Not only the garden is a public plaza, there is a second plaza on the roof of the lower ground-floor (Pelgrims & Winnen 2006). This terrace provides a view over the *Vanderkelenstraat* and it is seen as a in-between space (Figure 112). It is the outer transition from the street to the inner garden (Figure 113). Possibly, art will be shown at this public plaza but this did not happen until now (interview architect 2011).


Figure 112 Attic Window Auditorium


Figure 113 Attic Window Antichambre

FIRST FLOOR : GALLERY

This is another layer of the exhibition. Here, temporary exhibitions are situated because the concept of this layer is 'unlocking'. Museum M tries to offer three temporary exhibitions each year (interview architecture guide 2011). It could be exhibitions about a certain theme or even about one specific artist, but they should have international allure (M Museum Leuven 2009). For these temporary exhibitions M focuses on the period 1950 – 1990.

After going up by the old staircase you are in the former private rooms of the Vander Kelen family. The staircase goes all the way up to the second floor but it is closed off for the public as it is not part of the exhibition.

Space 13 (Vander Kelen): Like space 4, this one is called 'Louvain Faces II'. For example a small model of one of the towers of the Sint Pieters church is set up here.
Space 14 (Vander Kelen): In this room of the Vander Kelen house a painting of Rogier van der Weyden is on display. This space contains only the painting and information about it because some specials conservation methods are used.

Space 15 till up to 17 (Vander Kelen): Some weeks ago you were not allowed to enter this rooms because the museum was preparing the exhibition about Pieter-Joseph Verhaghen, but now the exhibition is open for the public. The works of Verhaghen are situated from room 15 till up to 18. In these spaces colourful carpet is placed on the floor. Depending on the exhibition the decoration of the room varies (interview architecture guide 2011).

Space 15 (Vander Kelen): This space focuses on the education of the young Verhaghen, the name of the space is 'Verhaghen's Training'.
Space 16 (Vander Kelen): Behind the space about his education, there is this room displaying some of his early works. The space is called 'The Young Verhaghen'.
Space 17 (Vander Kelen): During his later life, Verhaghen had the opportunity to become a court painter. This space, *i.e.* 'The Empress's Painter' displays some of his works commissioned by the empress (Figure 114).

Space 18 is part of the exhibition about Pieter-Joseph Verhaghen but it is situated in a new volume, *i.e.* the small tower. This transition is also indicated by a small bridge but for a change you cannot look outside because the windows are blacked out (Figure 118).

Space 18 (small tower): This is a very tall space with a view on the garden about the 'Mayor Works' of Verhaghen (Figure 115). To continue the exhibition track you have to go up by a small staircase.

Figure 114 Space 17

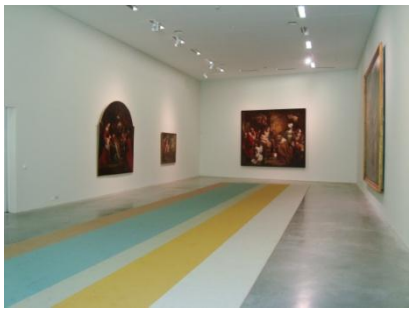

Figure 115 Space 18

After space 18 you have to walk over a bridge again (Figure 119). This bridge provides a great view on the central garden and the oak tree. The ramp of the bridge carries on into the next space.

Figure 116 Bridge 5-6

Figure 117 Bridge 6-7

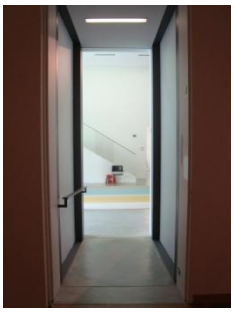

Figure 118 Bridge 17-18

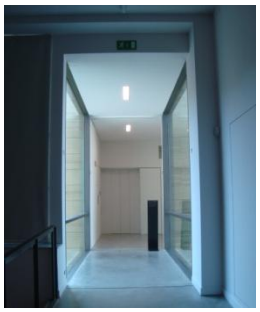

Figure 119 Bridge 18-19

Space 19 (Académie): Upon leaving space 18 you are already aware of the next space. Here, the room situated above the Constantin Meunier space, contains a video projection and matching sound. Most of the people just pass by this installation; they do not go further into the space (interview architecture guide 2011). This space contains the first work of Pedro Cabrita Reis, a contemporary Portuguese artist. The following spaces are also devoted to his work.

Space 20 (Académie): This is the corridor of the Académie. Just as in the corridor below, you have the typical staircase at one side and a great view on the garden and the buildings on the other side. Nowadays this corridor in its entirety is painted orange (Figure 120).

Space 21 (Académie): Space 21 is a totally white space with a piece of art of Pedro Cabrita Reis in the middle.

Space 22 (Académie): This is the other corridor of the Académie. Like the corridor on the ground floor, the door at the end gives access to the offices of the staff.

Space 23 (long volume): Like on the lower level the architect did not place a bridge to indicate the transition between an old and a new volume. But walking into space 23 is a special experience. On your right side there is a void, where you can have a look at space 1. On your left side the window provides a view over the garden. Space 23 itself is a large longitudinal space. At one side you have a look over the *Vanderkelenstraat* and the entrance with the portico.

Space 24 (long volume): The form of this space is totally different than that of the previous space. This space is long in the other direction but does not touch the portico. Almost at the corner a large window gives a view of the street and the

central library. In the middle of the space is a box is situated. It was meant for getting natural daylight into the space (interview architect 2011). Through this box the rain also fell down. After some complaints it is now covered on top. In this way you still have a view of the stairs and the entrance ramp.
Space 25 (long volume): This space also contains some pieces of the Portuguese artist (Figure 121). At the side of the garden a window is situated. The window gives a nice overview of the Vander Kelen – Mertens house.
Space 26 (long volume): Space 26 is the last room of the exhibition track on the first floor. There are no windows in this space except for an inner window to the staircase.


Figure 120 Space 20


Figure 121 Space 25

After visiting the first floor you are supposed to take the stairs or the elevator to the last level of the building.

SECOND FLOOR : GALLERY

This is also a layer of the exhibition; the concept 'creating' is stressed in this layer. Temporary exhibitions about contemporary plastic art are located in this floor (M Museum Leuven 2009). Plastic arts are a wide concept: they can also be lectures, presentations or publications. The artists can be young talents or well-known names. Nowadays this floor contains pieces of art by Pedro Cabrita Reis (sequel of the first floor) and the Belgian artist Freek Wambacq.

Space 27 (long volume): The space is called 'Mirador' because this space gives the visitor an excellent view over the city (Figure 122). You can see the steeples of the City Hall and the spire of the Sint Pieters Church. Here a last work of Pedro Cabrita Reis is shown.

To visit the last part of the exhibition you have to take the stairs to the roof terrace[25]. On the other side of the roof terrace you can enter the building again.

Space 28 (Académie): In the last three spaces of the exhibition, the work of Freek Wambacq is exhibited. To enter this exhibition space from the side of the roof terrace

[25] See 'Roof Terrace', p.86

you have descend long stairs outside; inside there is a ramp. The space itself is very spacious and the pieces of art are dispersed throughout the room (Figure 123).
Space 29 (Académie): Here the typical corridor of the Académie reappears. It has the same structure as the underlying floors: with the staircase on one side and a tall window on the other side.
Space 30 (Académie): This space is not as large as the spaces downstairs because of the technical installation on this floor (interview architecture guide 2011). The room contains only one piece. The collection of Freek Wambacq ends here.

After space 30 the visitors are in the small tower again. The architect also choose to place a bridge between the old volume of the Académie and the new small tower.

Figure 122 Space 27

Figure 123 Space 28

Space 31 (small tower): This space is a workshop room and is closed off for the public. It is rarely used for exhibitions because the walls and the lighting are not adapted for exhibitions (interview architecture guide 2011).
When arriving in this space, the visitor has seen all the exhibition spaces of the track. Now the person can take the elevator right in front of him/her and return to the Antichambre where the track started.

ROOF TERRACE

On the second floor of Museum M, there is a roof terrace (Figure 124). The roof gives an amazing view over the city: the central library, the beetle by Jan Fabre, the City Hall, the Sint Pieters church,.. and of course you get a great overview of the Museum site itself. On the roof there is the top of the rain box and a specific part of the roof is covered. This space can serve to exhibit pieces of art of greater value than the ones on the public plaza or in the garden (interview architect 2011). The roof terrace can only be reached with a ticket, as it is part of the exhibition track.

ARTISTS IN RESIDENCE

The rooms which were originally intended for the Artists in Residence and the workshop spaces are situated at the back of the building, *i.e.* in the small tower (Pelgrims & Winnen 2006). The workshop space is space 31, the space for the artists in residence is situated on the level above. Because the museum staff did not want to

let people sleep over in the museum the function of these spaces has changed (interview architecture guide 2011). The workshop space is described in 'space 31'. Nowadays the level above is a conference room (Figure 125). Companies or associations have the possibility to hire this space for meetings. There is an excellent view over the city and the Museum site.

Figure 124 Roof Terrace

Figure 125 Artists in Residence

CAFÉ

The café is part of the museum. It is located at the end of the exhibition track. When the museum is closed, it still can be used, together with the lavatories which are situated at level -2 (Pelgrims & Winnen 2006). The café is accessible by the main entrance or a directly accessible via the entrance in the *Savoyestraat*.

BOOKSHOP

Just like the café, the bookshop is located close to the ticket service but also at the end of the exhibition track (Pelgrims & Winnen 2006). The café has a private entrance but the bookshop does not. While M is open, the bookshop is part of the Antichambre. When the museum is not anymore open but there are some evening activities, the bookshop can easily be closed. As mentioned above, nowadays there are some differences of opinion about the location of the ticket office (interview architect 2011). If the ticket office is going to move, maybe the bookshop will also move as well. But until now the bookshop is situated between the ticket service and the cafeteria.

EXIT

At the end of the visit, the visitor can go downstairs by the stairs or by one of the elevators. S/He enters the Antichambre again and leaves the Museum site by one of the entrances.

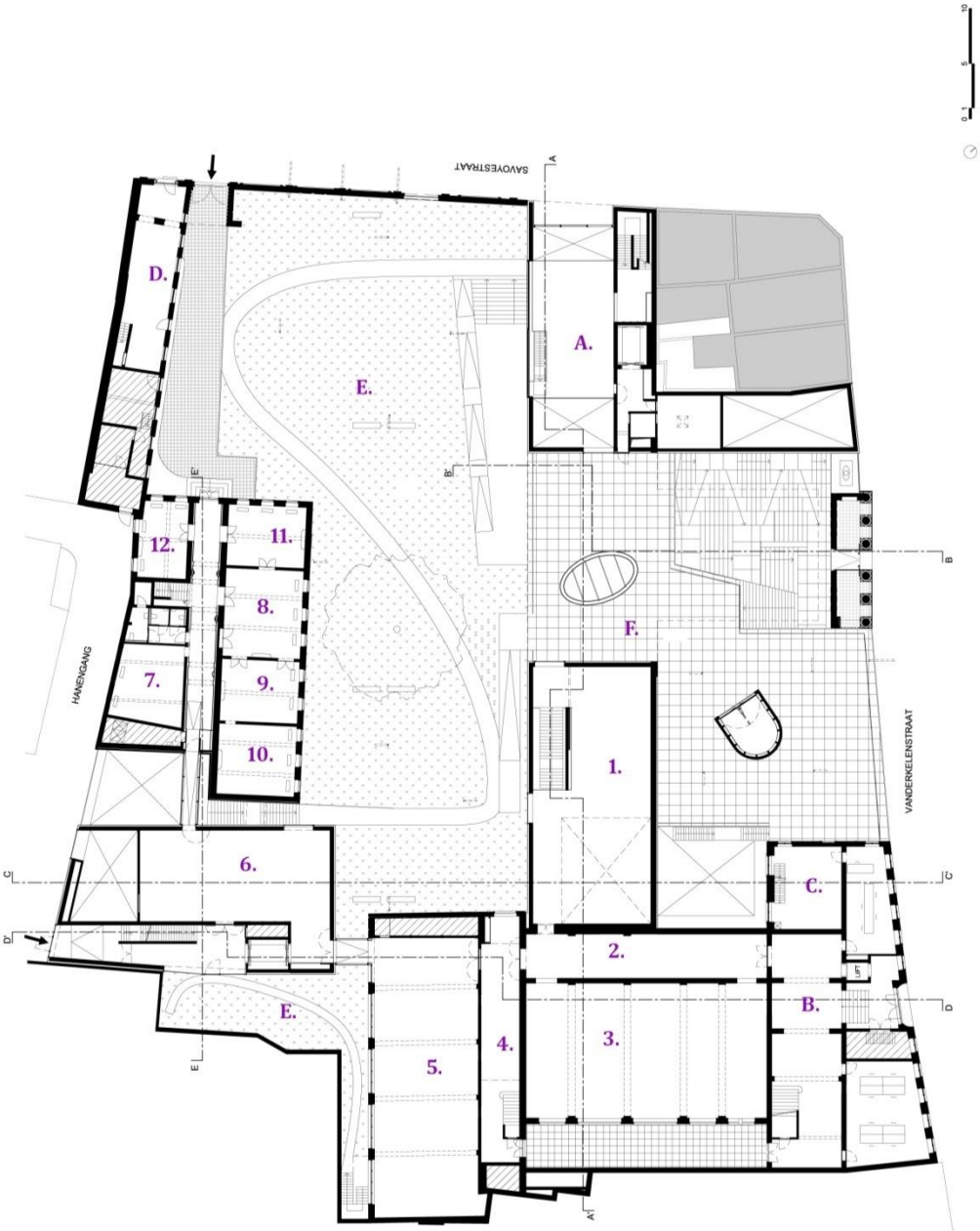

Figure 126 Ground Floor

1. Space 1: Sculptures and Carvings from Brabant 2. Space 2: Precious Survivors
3. Space 3: From Gothic to Renaissanc 4. Space 4: Louvain Faces
5. Space 5: Constantin Meunier 6. Space 6: Bourgeois Ostentation
7. Space 7: A Romantic Cabinet 8. Space 8 9. Space 9 10. Space 10: Porcelain
11. Space 11 12. Space 12

A. Café B. Office C. Library D. Kunst in Huis E. Garden F. Terrace

3.2.2 Analysis

After an elaborate description of Museum M in the previous part, we will now analyse this building by means of the concept of the architect and different perspectives. This analysis has a similar structure as the past analysis of the Pavilion of Knowledge, which makes it easy to compare both experiences of the user/experts.

3.2.2.1 Different Perspectives

Initially, we will give information about the persons who and the publications which are consulted for this analysis. Next to the architect we have conducted an interview with an employee of the museum, in this case an architecture guide. As we are interested in the experiences of persons with an impairment, we also took a physically impaired person and a visually impaired persons on a walk through the Pavilion and recorded their experiences. To complement this analysis we have read some (professional) literature about Museum M.

The user/experts of this case study will be also described under a false name for privacy reasons. We are very pleased these persons were interested in a visit but we respect their privacy. We have to mention as well, associations and past experiences may influence his/her experience of the Pavilion (Malik 2006).

ARCHITECT

The office responsible for this project is Stéphane Beel Architects, founded in 1993 in the Flemish City of Ghent. This office was chosen after a competition between five famous architecture offices. Their approach of the site was appreciated by all the members of the jury.

In the introduction to an interview with the architect himself we can read that it is not exactly a surprise this architecture office from Ghent won the competition (Stad Leuven 2009e). Stéphane Beel has international experience in the discipline of architecture for museums (De Rynck 2009). Realisations of this office are the extension of the Centraal Museum, Utrecht (1994-1999), the paviljoen of Rubenshuis, Antwerp (1997), the Raveel Museum, Machelen-Zulte (1995-1999) and the renovation of the Koninklijk Museum voor Midden-Afrika, Tervuren.

The new Flemish Regulation about Accessibility (01/03/2010) was not operative yet during the period of the conception and the construction phase, since the museum opened in September of 2009. Still the museum is known for all the adaptations for people with disabilities, mainly physical ones. Stéphane Beel himself suffers from a form of Multiple Sclerosis (MS). The architect consulted (see below) and the architecture guide of the museum (see below) think his own condition may be one of the reasons why he pays a lot of attention to accessibility in projects.

An interview in September 2010 about another project of his office, e.g. De Singel in Antwerp, contains some striking quotes. "*I continuously try to imagine I am somebody else. It sounds pretentious but I try to pose as a cleaning lady. I need to understand how a cleaning lady reasons. I need to imagine how a choirmaster argues, but there are many kinds of choirmasters. It is not allowed to be only concerned about an architect, you have to try to look as the man in the street, and I assure you it is not easy*" says Stéphane Beel (Braet 2010).

An interview was conducted with the architect responsible for the construction of the project in Louvain. He finished his studies in 2006 and immediately started working on this site (interview architect 2011). He did not participate in the conception phase but he was informed about all the aspects of the project.

EMPLOYEE OF THE MUSEUM (ARCHITECTURE GUIDE)

Museum M puts considerable effort in guided tours adapted to specific groups of visitors. There are conducted tours for little children, for teenagers, for older people and for persons with a visual impairment. Architectural tours are organized as well for people who want to know more about the architecture of the building.

We spoke with a woman who is responsible for the guided tours about architecture. She is also educated to organize tours for people who are blind or who have a physical impairment. She gave us advice about guiding these people and she also gave information about the architecture and the history of Museum M itself. She did not immediately give her opinion, only when we asked explicitly for it. A striking fact she mentions is the absence of an adviser for the accessibility. In her opinion this person would be unemployed most of the time...

PERSON WITH A SENSORY DISABILITY

To complement the research we paid a visit to the museum accompanied of a person with a visual impairment. Since 1984 the sensory nerves of his eyes are damaged, as a consequence of which he largely lost his sight. Filip is classified as blind as since the range of vision is less than 1/20 of his total sight capacity. Still he has a very visual approach to a building. He is able to see the global volume of the building but he cannot see details of the architecture. To find out more about the details Filip uses a small telescope. When there is a lot of sunlight he immediately puts on his sunglasses. He admits he now has a wider experience of the environment than before he lost his sight. Next to a visual approach he appreciates the tactile and auditory qualities of the built environment very much.

His professional job has nothing to do with architecture or with disabilities but since he was a teenager he has been already interested in the built environment. He prefers churches and older buildings, but he also values new architecture such as Museum M. As Filip is interested in this field he is already often consulted as a

user/expert with a disability. He already knew the building and was also aware of the aspects of the experience we were interested in.

As already mentioned above, the museum also organizes activities for visually impaired persons, it is called 'Rijk der Zinnen'. The persons who attend these visits are timely people who are interested in the experience of blind people.

PERSON WITH A PHYSICAL DISABILITY

For this thesis we do not only focus on persons with a sensory disability but also on persons with a physical disability. The woman who assisted us in the research has a congenital physical impairment. Her legs have always been paralyzed and she has a manual wheelchair. Charlotte can move herself, she goes to work independently every day with her adapted car. But for longer distances, like this tour through the museum, she needs a companion to guide the wheelchair.

For Charlotte it was the first time she was in Louvain; she did not know anything about Museum M. It was also the first experience for her as user/expert (Ostroff 1997). She was very interested in visiting the museum and she mentioned that people with a disability should be consulted more often for the conception of a new building. A problem Charlotte often faces is the fact that designers of a project do not realise themselves what it is to be disabled.

PROFESSIONAL LITERATURE

Museum M is quite a new building of a very well-known architecture office. Logically several texts have been published about this museum. Not only in the professional literature about architecture but also in the popular newspapers as Gazet Van Antwerpen and De Morgen some articles were published.

We will focus on the professional literature in architecture magazines and find out how they experienced the new Museum site in Louvain.

3.2.2.2 Concept meets Reality

For this part we have selected certain parts of the concept. We will go from macro to micro aspects of the building. First, we will consider the overall context in which the building is established. The materials and the general lay-out of the building will be discussed under 'Exterior'. After that, we will first consider the first impression and all the possible entrances, then the main entrance. Before the exhibition itself starts, the visitors are gathered in one space. Logically, we will also explore the exhibition spaces themselves. In the end, we will focus on the central space of the building and the concept of lighting.

These aspects are chosen because they support the concept itself. They are preferred as well for the similar structure to the previous analysis, the one of the Pavilion of Knowledge. In this case, both the analyses can be easily compared.

CONTEXT – "*Museum M is a chamber in the city*" (De Rynck 2009).

As Pieter T'Jonck (2010) explains in the publication 'Hedendaagse Architectuur in Leuven 2006/2010' that Museum M fits perfectly in the strategy of bringing Louvain to the foreground of leading Flemish cities. In his opinion the museum reflects the evolution of the city itself: "*from a vaguely interesting but musty spot to a institution which is internationally known*" .

Stéphane Beel wanted to integrate the museum into Louvain, says the architecture guide, and she thinks he fully succeeded in this purpose. In her opinion you can best perceive the fact of the integration of the Museum site into the city on the roof terrace. She makes a comparison to the Guggenheim of Bilbao. The Guggenheim towers above the city, whereas Museum M is clearly part of the city. This aspect of the Museum site is confirmed in the professional literature. Pelgrims and Winnen (2006) state that the museum had established itself in the city centre. In their opinion the site is not an odd body opposing to the neighbours but a self-conscious and attractive building which does not go under in the lively environment.

The environment of Louvain is characterised by many passages and semi public University buildings (Liefooghe 2010). The architect tells us Museum M is a chamber in this city like there are many scattered around the city, for example the STUK or University buildings in the Naamsestraat. In Pelgrims and Winnen (2006) we read a quote of Stéphane Beel saying something similar: "*I consider the site as a municipal chamber. In Louvain there are several enclosed open areas, for instance the courtyard of Pauscollege*". By considering the Museum site as a chamber of the city, Stéphane Beel intensifies the nature of Louvain. Stéphane Beel describes his interventions as follows (Stad en Architectuur 2006): "*Not only the well-defined assignment should be considered by the architect, the city around the site should be taken into account as well. It is not the purpose of the architect to change the whole city, but because a project can have a surplus value. This surplus value can upgrade the museum as well as the city!*"

A major aspect of creating a museum is routing. Their architecture office attaches great importance to the fact that visitors should be able to recognise where they are exactly inside a building. A striking fact the architect mentions is that Stéphane Beel mostly designs a museum from the inside out and not primarily for the esthetical view of the outside. For this reason windows are conceived on well-considered places (Figure 127). Liefooghe (2010) talks about "*new volumes covered with travertine in which sparsely windows are cut out*". Sometimes a window provides a view over the city, sometimes the visitor can catch a glimpse of the garden. On the website of Stad Leuven (2009c) the city describes that the visitor has wonderful views over the city or of the building itself. In their opinion these views prove how the whole complex is perfectly placed into the city. During the visits with the user/experts we notice they pay attention to the windows with the views but these experiences will be discussed more extensively under 'lighting'[26].

The most delightful view over the city can be observed from the top of the Museum site, *i.e.* the roof terrace (Figure 128). This is contended by the architect but confirmed by the other perspectives. De Rynck (2009) mentions: "*The wonderful views over the city culminate in the roof terrace which is part of the exhibition track*". While standing on the roof terrace the architecture guide points out the Central Library and the *Totem* (*i.e.* a work of art created by Jan Fabre) on the *Ladeuzeplein*. The roof terrace also possesses visual qualities in the opinion of the visually impaired person. By using his small telescope Filip is able to discern the Central Library and the City Hall. The person with a physical impairment enjoys the panorama on the roof terrace too. Charlotte does not know Louvain so we had to point to out the monuments for her but she also considers the roof terrace as a quality of the museum. While walking through the museum, the visitor is not able to forget being in Louvain (De Rynck 2009). A fact that both user/experts (and the companion of wheelchair user) notice is the white colour of the stones on the roof terrace. On the days of the visits in company of the user/experts the weather was very sunny; the strong reflection of the sun really bothers them. The visually impaired person not only pays attention to the visual qualities of the roof terrace but also to the auditory qualities. Filip appreciates the tolling of the bell of the Central Library. Persons can not only see that they are at a certain height, but they can also hear it because you can listen to the persons who are at ground level. Feeling and hearing the wind is also a quality of the roof terrace, in Filip's opinion.

[26] See 'Lighting', p.112

Figure 127 Well-considered Windows

Figure 128 Views over the City

Because the museum is situated in the city centre it has to take the limits of the city in account. The city council wants to ban as much car traffic as possible from the centre [27]. The architect mentions there was never a demand for a private parking. The subterranean parking (with elevator) of the *Ladeuzeplein* is very close and the public transportation system of the city is extensive. The architecture guide confirms this but adds that lorries are allowed to drive through the *Vanderkelenstraat* for deliveries. Most of the time they try to deliver very early so they do not hinder the pedestrians during daytime. These claims are substantiated by the consulted user/experts. Filip thinks the location of the museum is perfect. Generally he gets off the bus at the railway station and walks to M. Because of the road works in progress at the Maarschalk Fochplein he got off the bus at the Brusselsestraat and entered the Museum site via the entrance of the *Savoyestraat*. Getting here is not a problem for Filip. Charlotte is also pleased with the location of Museum M. They came by car and parked the car at the *Ladeuzeplein*. The proximity of the car park and the presence of an elevator and parking spaces for disabled persons are definitively positive in her opinion. But they made a remark on the small parking spaces in this car park. Because of the companion she was able to get out of the car but on her own it would not be possible in such a small parking. But this is, of course, a characteristic of the parking itself and not of the Museum site. We can conclude that the user/experts are both satisfied with the transportation possibilities and the location of the Museum site (Figure 129). Yet in the professional literature we read a comment about the position of the Museum site: "*Nevertheless a question of a tourist makes it clear to me the museum still has some needs. A better indication of Museum M in the city (...) would stimulate the success of the Museum site*" (Wijle 2010).

Figure 129 Signage

[27] See 'Location and Transport', p.71

EXTERIOR – "*The Museum site is a conscious composition of the conservation of valuable buildings, the demolition of miserable constructions and the addition of new volumes*" (WVA 2003).

During our interview the architect explained this concept very clear: "*Some old volumes are removed to make the site legible. Two new volumes are added, on the one hand to define the Museum site, on the other hand to make the site accessible through well-considered openings*." The website of the Stad Leuven (2009b) seems very positive about Museum M: "*The results of Beel's interventions are astounding. The valuable historical elements like the Vander Kelen House or the central oak tree stand out better than in the former context*". Not only the city itself speaks highly of the Museum site, the professional literature as well is full of praise for the project: "*The volumes are established so that the new configuration almost seems evident*" (Dubois 2009).

At the beginning of the guided tour, the architecture guide always walks into the garden to indicate the different volumes. For her the distinction between old and new volumes is also expressed in the way the façades are dealt with. The material of the new volumes is travertine, the old volumes use masonry (Figure 130). The large white stones of the newly built entities are in contrast with the small red bricks of the old buildings in terms of size and colour.

Marc Dubois (2009) explains the choice for travertine is not accidental. During the 20th century a peculiar connotation arose between the classical architectural style and the modernity. Mies van der Rohe was able to transform the status of the travertine by the copious application of travertine for the German Pavilion in Barcelona in 1929. In an age of the modern materials such as steel, concrete and glass the old-fashioned material travertine suddenly became modern. Dubois remarks Beel's fascination for Mies and his use of travertine was already apparent in the Pavilion of Rubenshuis (Antwerp). One of his design images (Figure 131) even contains the statue of Georg Kolbe which is normally located in the Barcelona Pavilion. Another journalist interprets the choice for travertine as a contribution towards citizens who were longing for a prestigious palazzo (Wijle 2010). The Stad Leuven expresses its appreciation for travertine as follows: "*The pretty stone façade of the new volumes makes the buildings timeless and sacral*" (Stad Leuven 2009c).

Figure 130 Travertine and Masonry

Figure 131 Statue of Georg Kolbe

The distinction between the old and new volumes is brought to the attention of the user/experts but they did not mention it themselves. The person with a visual impairment already knew the building so he was already conscious of this fact. Filip admits he likes to touch the material of the façade. When entering the garden from the Antichambre he touches the travertine stones of the wall (Figure 132). The wheelchair user did not know anything about the building so Charlotte expected some explanation about the building before visiting it. The architecture guide suggested the garden is as an excellent starting point for a visit to the museum. Thus, the visitor is immediately faced with the composition of old and new volumes.

An interesting suggestion for the museum is made by Filip. He thinks the museum should offer a model of the Museum site. A model with volumes exists for the guided tours focusing on architecture. With this model the visitors have to explore the museum themselves (Figure 133). He is interested in architecture so that is probably the reason for his idea but he thinks many visitors of Museum M will be pleased with a model. The architecture guide did not talk about a model herself. When we told her this suggestion she was surprised but admitted it could be a good idea.

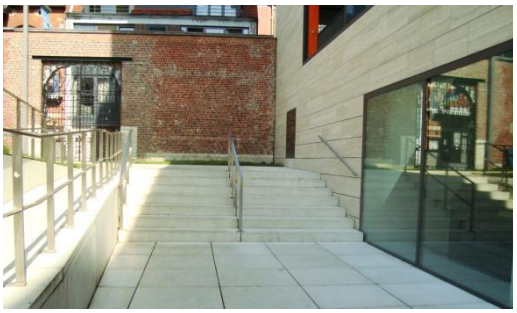

Figure 132 Garden

Figure 133 Model

APPROACHING THE SITE – Three entrances, three different atmospheres (Beel 2009).

Beel foresaw three different entrances: one urban, one cosy and one informal entrance[28]. All these entrances are accessible to people with disabilities, the architect says. Every entrance leads to a specific space of the Museum site, as is observed in the professional literature (ECL 2008). The three entrances meet in the central garden at the old oak tree (Pelgrims & Winnen 2006).

The informal entrance is situated at the *Hanengang*. As our user/experts were not allowed to use this entrance, they do not have an opinion about this one. The other two entrances are used more frequently for visiting the Museum site.

[28] See 'Architectural Concept', p.73

The cosy entrance of the *Savoyestraat* opens onto the garden. The architect mentions there is a descending path through the garden connecting this entrance to a door of the Antichambre. The person with a visual impairment entered via this entrance on the day of the visit. The reason for entering here was that Filip got off the bus in the Brusselsestraat. He considers this entrance actually better for him than the urban entrance. Next to this baroque gate (Sterken 2010) there is another door onto the garden but this one is always closed. The architect confides that this closed gate was a demand from the beginning of the designing process.

The urban entrance is also the main entrance of the Museum site and is situated in the *Vanderkelenstraat*. This entrance is accentuated by the conserved fronton and pillars. This portico is the only relic of the previous City Library of 1937 (Ballhausen 1937). Although it was clear from the beginning of the designing process that this monument had to be conserved (WVA 2003), the architect tells us that Stéphane Beel found it very difficult to handle. On the one hand it is an international symbol of a museum, on the other hand it is too obvious. During the designing process they treated the portico as a relic for a long time but finally they did decide to consider the monumental fronton as the entrance. The portico is the entrance to the museum as the main entrance to the whole Museum site (Stad Leuven 2009b). Due to the cantilevered volume which almost touches the portico the entrance is even more emphasized. The *Stad Leuven* website (2009e) quotes Stéphane Beel to sum up: "*Originally we were very critical of the portico but now I consider it as a gift*".

The international symbolism of the museum seems to work because the two user/experts found this entrance easily (Figure 134). For Charlotte it was the first time she was in Louvain. When she and her companion entered the street it was clear for them the museum was here. Filip as well says the portico can be easily identified by him as the entrance. In contrast to the experience of our two user/experts, a journalist makes a remark on the entrance. "*Nevertheless a question of a tourist makes it clear to me the museum still has some needs. A better indication of Museum M in the City and the indication of the entrance (..) would stimulate the success of the Museum site*" (Wijle 2010)[29]. Filip mentions this will not help people who are totally blind, who are, moreover, not conscious about the fact that this is an international symbol of a museum. Soon after he mentions this fact Filip corrects himself. He wants to stress the symbol will not be recognised by blind people but that it is nonetheless an interesting historical element of the building. During a visit of the museum the blind visitors should feel the pillars (Figure 135). He likes to touch different types of stone, as he also mentioned this in the garden by touching the travertine walls. By touching the pillar base he feels the date 1766. The portico seems to be interesting as a visual and a tactile element.

[29] See 'Context', p.92

Figure 134 Main Entrance

Figure 135 Touching the Pillars

We suggested the possibility of a guidepath to the museum to the user/expert with a visual impairment. Filip immediately thinks of the indications in relief at the platforms of the railway station of Louvain. He did not think about it yet because it is not his discipline.

ARRIVAL – "*The main entrance should be very accessible and open to the public*" (Beel 2009).

A striking characteristic of the main entrance is the fact that visitors have to descend to enter the museum (Figure 136). The architecture guide makes a comparison to the British Museum (Figure 137) where you have to ascend to enter[30]. In the period of the construction of the British Museum, museums were a privilege for the bourgeoisie. The descent before entering Museum M is supposed to symbolise its accessibility to all people. When we talk about this openness to Filip, he understands this underlying thought but for him it does not make the museum more accessible. Below the problems are further specified: the banister does not go all the way down and the the staircase seems to be one white plane.

Figure 136 Entrance Museum M

Figure 137 Entrance British Museum

The architect found it important that the different groups of visitors do not have to separate; a person in a wheelchair and an able-bodied person can enter together by this entrance[31]. The architect tells us that there are rules for guaranteeing accessibility, but they dealt with them in an innovative way by crossing the ramp

[30] See 'Entrance hall/Antichambre', p.77

[31] See 'Arrival', p.76

through the stairs to handle and obey the rules. During the interview he mentions in the beginning the city council raised objections against the idea but later on they accepted this solution. Now the Stad Leuven expresses their approval about the entrance: "*By this fine way the museum is accessible for persons with a disability too*" (2009a). In the opinion of the architect it is very clear a person in a wheelchair will not have problems with the ramp. He is not aware of the experience of visually impaired visitors but he thinks it will be ok for them. He does make a critical comment about this solution. The remark concerns the going and the rise of the stairs. The typical formula for stairs (2 x rise + going = 58 à 63) does not apply. The flight of stairs of the entrance is characterised by long low steps. The architecture guide is not aware of potential problems or confusions about the entrance, she never heard complaints about the entrance.

When we consult user/experts we hear something quite different. As mentioned above, the visually impaired person understands the concept of openness but for him it is not easily accessible. In his opinion the flight of stairs is one white inclined plane. Filip is not able to perceive the distinction between the different stairs and of course the combination with the ramp makes it more difficult and confusing. In this situation he has to use his white cane. Although Charlotte does not have problems with her eyesight she too has problems with the perception of the ramp. Before entering she has to see carefully how the ramp is established (Figure 138).

The ramp and the stairs leading to this entrance are combined in such a way that they have to cross at certain moments. An aspect the user/experts mention of both the ramp and the stairs is the continuation of both of them. The ramp is not very visible for wheelchair user/experts. The companion of Charlotte finally notices that you have to follow the dots in the middle of the large stones of the ramp (Figure 139). They suggest there should be a difference in colour to mark the ramp.

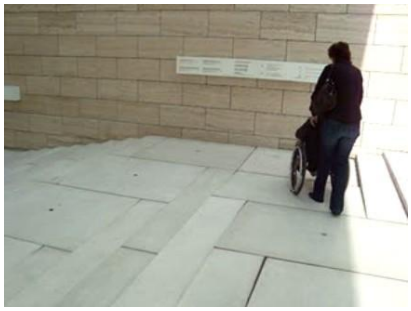

Figure 138 Charlotte Entering

Figure 139 Dots

When Filip sees a banister he always grabs it automatically (Figure 140). He has this reflex because in case he stumbles he does not immediately fall down. For descending this ramp he is also led by the banister. But when the ramp crosses the stairs the banister stops (Figure 141). This is necessary for the continuation of the ramp but Filip has troubles to find the next banister and thinks it is annoying. But a feature of the banister he really appreciates is that it begins at the first step and ends at the last step. This may seem obvious, but in reality it is not. He is confronted with

many cases where the banister stops but the staircase has two more stairs. This scares him because then there is a high risk of falling down.

Figure 140 Filip Grabs Banister

Figure 141 Banister Stops

For a long time, the architects were undecided about the material of the stairs. The architect tells us that they were thinking about a rough finish but finally they decided to keep the smooth surface of the concrete tiles. The first reason of this smooth finish is the resemblance to the other tiles, the architects wanted the same kind of concrete tiles in the entire Museum site. The second reason is the fact that the entrance is situated underneath the cantilevered volume, so the stairs cannot get wet because of the rain. When we visited the museum in the company of the user/experts (two different days) it was very sunny. Filip is pleased with the material, he thinks it fits very well to the new travertine façades. From other persons he heard that the stones can be slippery but he did not notice it himself. Both the user/experts notice the white colour of the stairs and the ramp is not ideal when it is very sunny (Figure 142). At street level you cannot make a distinction between the different steps and the ramp. From the Antichambre the distinction between the steps is more clear (Figure 143). Filip mentions it is always more easy to perceive the different steps from downstairs, this is not a typical characteristic of this flight of stairs.

Figure 142 Reflecting Sun

Figure 143 Steps Seen from Downstairs

Arriving downstairs entails another challenge for the visually impaired visitor. The place of the automatic door is logical but inside he would automatically walk straight ahead. Because this entrance volume is composed of glass he cannot perceive that visitors have to turn right (Figure 144). The architect told us that more persons had troubles with the glass, which is why the organisation of the museum stuck a row of small white triangles onto the glass. Our user/expert unfortunately is not able to perceive this signage. While he was still searching the entrance the automatic door

already closed. Charlotte does not have problems with the glass volume (Figure 145).

Figure 144 Filip and Glass

Figure 145 Charlotte and Automatic Door

The architecture guide stresses the fact that she wants to let the visitors feel the entrance. During her guided tours visitors have to feel the entrance is going down for a reason. Filip says something very interesting about the entrance. He says in this space you can still hear the city but you leave it behind you. The old portico is behind your back, the new volumes are in front of you and above you. You have the impression that you entered the museum, but actually you are still outside. By describing the movement of entering in this way he admits the sense of space and the concept are excellent. Just like Charlotte, he likes the concept, but unfortunately the realisation is not perfect. A journalist makes a critical remark on this entrance: "*It is a pity the combination of stairs and ramp (..) has become a transition zone rather than a space with residence quality*" (Wijle 2010).

BEFORE THE EXHIBITION – "*The protagonist of M is the 'Antichambre', an impressive transition zone between the museum and the outside world*" (De Rynck 2009).

The ramp inclines because the entrance should be open to the public. The architect describes the level of the Antichambre as half a level beneath street level. In that way the difference in level between the old and new volumes was easier to overcome. This solution befits the horizontality of the exhibition track (see below). Dubois (2009) expresses it as follows: "*At the bottom the clearly structured Antichambre connects the existing buildings in an efficient way*". Filip appreciates the fact that Museum M is situated on an inclining site. The difference in level makes it interesting for him.

Stad Leuven (2009a) mentions that the Entrance Hall is interpreted as a kind of Market Hall. It is a freely accessible space which makes the transition between the street and the actual museum. By situating the Antichambre half a level into the ground, several views to the central garden are created. According to the architect, some patios are created to get more daylight in the Antichambre[32]. There is one in

[32] See 'Entrance hall/Antichambre', p.77

the children's workshop and one next to the entrance. The architect also confides to us that sneak previews were conceived from the Antichambre into the Depot[33], but for financial reasons these were not executed. The overall impression of the Antichambre is light and pleasant for the visually impaired user/expert. Although Filip is not able to see all details, he is able to perceive daylight. In his opinion daylight is always adds value to a building. He appreciates the different views through the building for example onto the central garden. The first impression of the Antichambre is agreeable to Charlotte. Both the user/experts value the acoustics of the space as excellent. The architect says the application of acoustic plaster increases the quality of the acoustics. The Antichambre has a public character but the Stad Leuven (2009a) mentions this was not a matter of course because a museum has to be closed off at night for safety reasons.

At the time of the opening of Museum M the ticket office was situated in the middle of the Antichambre; nowadays this white desk is still here but it is not used anymore for selling tickets. The architect tells us that the old desk is only used for events. Filip remembers the white desk from previous visits to the museum. He points at two steps next to a ramp which you have to use to reach the former ticket office. Now he is aware of this difference in level; the first time he was here he fell down. He knows there is a ramp with a banister on the side but a visually impaired person does not have the reflex to walk to the ramp immediately. It is the first time the user/expert with a physical impairment was in the museum so Charlotte is not aware of the former ticket office. When we indicated this white desk she gets enthusiastic about it because of the ideal height for her. She often has problems with desks and sometimes it is embarrassing. For example, in her professional career she is a secretary behind a desk and even that desk is not adapted to her size. The two steps in front of this white desk do constitute an obstacle for her; she has to take the ramp on the other side of the Antichambre.

Nowadays the ticket office is situated next to the bookshop (Figure 146). When visually impaired persons want to visit the museum in the company of a guide, they first go to the ticket office. While they are waiting for a guide, the architecture guide says, these persons often sit down on the two steps next to the ticket office. When they are sitting here they can hear the guide arriving. But she is not aware of potential problems about these steps. Filip did not know the place of the ticket office changed but he admits he did not search for it. Now that the ticket office is situated here the problem of the steps is automatically avoided; in his opinion it is an improvement. However, the height of the new desk is certainly an obstruction for the wheelchair user/expert. Charlotte suggests a part of the desk can be cut out at her height, but she knows this is often a problem. The architect tells us that they are talking about changing the location of the ticket office again. The organisation of the museum wants to place the ticket office deeper into the Antichambre so that a larger public will be drawn into the building. Maybe this will be a solution for avoiding the experienced obstacles.

[33] See 'Depot', p.79

De Rycnk summarizes: "*The Antichambre is a tingling and lively space*" (2009). From the Antichambre it is possible to access directly the auditorium, the children's workshop, the bookshop, the cafeteria, the central garden and of course the exhibition itself. Filip was here several times before already, so he knows where the exposition starts. The user with a physical impairment did not immediately notice the beginning of the exhibition. After searching a bit she suddenly sees the word 'START' at the beginning of the stairs (Figure 147). But this staircase is not accessible for her, and there is no signage to the elevator. She supposes it will be indicated at the ticket office when she visits the museum on her own. Nevertheless Pelgrims and Winnen (2005) state: "*The convenient arrangement of the spaces makes signage almost redundant*".

Figure 146 Antichambre

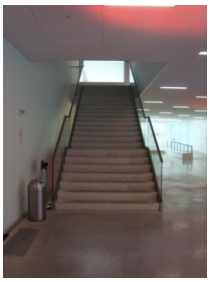

Figure 147 Staircase

CONTENT OF THE EXHIBITION – Three levels, three concepts, three exhibitions (Beel 2009).

The most important parts of a museum obviously are the exhibition spaces (Stad Leuven 2009d). The exhibition programme is spread over three layers. Both old and new volumes are integrated in the exhibition track. A journalist describes it as follows: "*New beam shaped volumes in the company of old buildings and pieces of art should produce a pleasant and refreshing exhibition track*" (ECL 2008). The other proposals generally conceived autonomous volumes which were connected on one level. The architect guesses that their approach has an advantage compared to the other proposals. In their design there is no link between an old building and old works of art. In an interview, Stéphane Beel contends: "*During the design of an exhibition space I experience that contemporary artists like to display in certain older spaces, whereas old art stands out well in contemporary buildings*" (Stad Leuven 2009e). At the time of our visit, the semi permanent collection is shown on the ground floor, the temporary one is situated on the first floor and the contemporary art on the second floor. But one layer is not specifically designed for one type of art. It is possible for the exhibitions to change level, says the architect. A journalist summarizes: "*Old and new are horizontally spread over all the buildings, the track of old and new art swings over the whole site, in a lamination which actually reflects the lamination of the city*" (De Rynck 2009).

The professional literature is enthusiastic about the exhibition track: "*The horizontal threading through the various buildings provides a succession of atmospheres*"

(Liefooghe 2010). When we sound the user/experts and the architecture guide about the succession of atmospheres, we only get positive reactions. The architecture guide mentions she adores the variation between old and new. Filip appreciates the alternation of old and new buildings too. Walking through a new or an old part of the building is a totally different acoustic experience. Also the tactile experience is not the same; he touches, for example, the walls of Vander Kelen House (Figure 148). Usually he prefers modern rooms because they are generally more comfortable. Here it is interesting for him to experience the contrast between the modern spaces of Beel (Figure 149) and the old rooms (Figure 150). They are totally different visually but also the acoustics and the tactile experiences vary considerably. This user/expert also mentions something about the size of the new spaces. Filip says he likes the fact all the spaces have different sizes. For instance space 24 (long volume) is longer than the previous one, *e.g.* space 23 (long volume). He mentions there is even a different acoustical effect between the new spaces. Charlotte values the variety as interesting too. A journalist quotes: "*The exhibition track of the visitor is varied. There are series of small rooms, but to offer the organisers of the exhibitions as many possibilities for the lay out, the new parts of the museum especially holds spacious and tall spaces*" (ECL 2008).

Figure 148 Touching Walls

Figure 149 Modern Spaces

Figure 150 Old Spaces

Between the old and the new volumes the architect in most cases created small bridges. They are supposed to make the visitor conscious of the transition between an old and a new volume of the Museum site. Stad Leuven remarks: "*An inattentive visitor does not even notice the transition between an old and a new part of the museum*" (2009b). The small bridges between the old and the new volumes are appreciated by the architecture guide as well as both the user/experts (Figure 151). Filip tries to see the environment, for example from the bridge between space 5 (Académie) and space 6 (small tower) he observes the tree and the long volume (Figure 152). He also is aware of the warmth of the sunlight in the bridge and the difference in acoustics inside a glazed bridge. In an architecture magazine we read: "*Via the short passages even the courtyard becomes part of the exhibition track*" (Liefooghe 2010).

The architect confirms that they designed a typical exhibition track through the different volumes. The flights of stairs between the different levels are part of the exhibition track. He admits it is not a problem when a person deviates from the track. During the exhibition for the opening the visitors first had to take the elevator to the second floor for the exhibition about Rogier van der Weyden. As the levels are

arranged thematically it does not matter where on the floor you start. When a person takes the elevator there will be no problem for the experience of the exhibitions. The architecture guide advises against using the stairs when accompanied by person with a visual impairment. But most of the time Filip uses the stairs and follows the typical exhibition track. Charlotte of course opts for the elevator and we deviate from the track. She does not mind departing from the typical track because she does not know the museum. For her it is important we can access all the rooms. If it was not possible to visit all the spaces, she would be slightly disappointed.

Figure 151 Charlotte and Small Bridge

Figure 152 Filip and Small Bridge

The Museum site is a composition of old and new volumes which are horizontally connected by the exhibition track. These connections are realised in glass bridges between the volumes. Most of these little bridges are inclining because of the difference in level between old and new. The architect tells us that some ramps have been adapted on the spot during the construction. For instance the ramp of space 6 (small tower) now penetrates the Vander Kelen House. Actually this ramp was supposed to be shorter but otherwise it would be too steep. In an interview Stéphane Beel says about this ramp: "*Sometimes it is a good idea to show the transition between the different zones. For example at the transition between the small tower and the Vander Kelen Huis. A corridor connects the two buildings. The visitor realizes he enters the original museum*" (Stad Leuven 2009e). The ramp in space 19 (Académie) had to be extended on the spot as well. Charlotte thinks these ramps are very comfortable. Filip enjoys ramps too. As he demonstrated in the garden, he knows ramps are actually provided for wheelchair users but he prefers ramps too. When there is a staircase on the exhibition track he does not mind taking stairs; going upstairs is not a problem for him. He has no strong preference for any one type of stairs, old (Figure 153) or new (Figure 154). Modern staircases are not yet slanting or damaged but the rhythm of older stairs is predictable.

Figure 153 Stairs of Vander Kelen House

Figure 154 Modern Staircase

When walking from the roof terrace to space 28 (Académie) it is strange to suddenly experience a small step at the end of the stairs (Figure 155). As Filip already emphasized at the entrance banisters are important to him (Figure 156). This staircase at the roof terrace is not very much appreciated by Charlotte. The architect tells us that this is a difficulty of the accessibility. Originally they preferred a ramp but it could not be realised because of the restricted surface. They have realised a solution in between a ramp and a staircase, *i.e.* a staircase with long steps (Figure 157). The architect says it should be possible for a person in a wheelchair to take the stairs. When we confront Charlotte and her companion with this special staircase, it seems to be really impossible.

Figure 155 Small Step

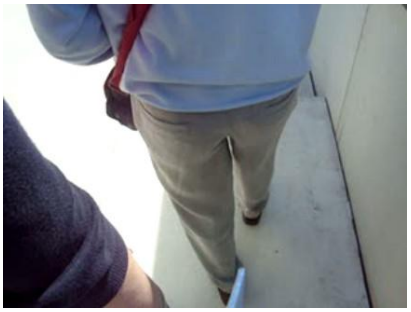

Figure 156 Filip and Staircase

Figure 157 Long Steps

Next to many stairs and ramps the visitor can also take two public elevators. These elevators are situated at the two ends of the site and are most of the time accessible from two sides. The size of the elevators is spacious enough for moving works of art through the museum and also people in wheelchair take advantage of it (Figure 158). The architecture guide admits the elevator is actually still too small for moving large masterpieces but Charlotte appreciates the size of the elevator (Figure 159). A comment both the user/experts make about the elevators is their complexity. If you do not know the building it is not always clear where you will end up. During the visit with the architecture guide we notice she still has problems finding the right exit. About the vertical circulation De Rynck (2009) mentions: "*The whole site is accessible for persons with a physical disability, there is no distinction between 'kinds of visitors'. Through the same ways they reach the different levels*".

Figure 158 Public Elevator

Figure 159 Charlotte and Elevator

Next to the connections between levels for circulation reasons, the architect opted for other links between spaces. There is a void between space 23 (long volume) and space 1 (long volume). The architecture guide knows persons in a wheelchair are

not able to enjoy the view because of safety reasons (height of the banister), but during visits she always mentions the view. When we start the visit in the company of Filip in space 1 (long volume) he immediately mentions the void although he is not able to see the opening. When we are in space 23 (long volume) he mentions the void again and tries to listen to the visitors downstairs (Figure 160). Unfortunately it was around lunch time and there were not so many visitors in the museum, so the effect of hearing people talking and walking was limited. As the architecture guide thought, the wheelchair user/expert is not able to enjoy the view of space 1 (long volume) from space 23 (long volume). But Charlotte enjoys the acoustic effect of it and remembers space 1 (long volume). Some sculptures are hanging on the walls of space 1 (Figure 161), but she is only able to see one of them. She understands for security reasons it is not possible to decrease the height of the banister.

Figure 160 Void of Space 23

Figure 161 Sculptures

Another void is indicated by Filip. We have to admit we did not notice this void during previous visits, nor did the architect or did the architecture guide mention it. It is surprising that a person with a visual impairment notices an unmistakably visual quality. In space 6 (small tower) there is an inner window to the children's workshop (Figure 162). Here the visitors are able to view a painting of the children's workshop. The void is closed off with glass and no children were playing at the time of our visit, so Filip could not assess acoustic qualities. When we show this void to Charlotte she likes the unexpected view on the painting; the height of the window is excellent for her (Figure 163). She notices she is not able to see the workshop downstairs but we do not think this is the purpose of this window.

Figure 162 Void of Space 6

Figure 163 Charlotte and Void

The exhibition on the ground floor is semi permanent; the exhibitions of the two other levels regularly change content. Filip remembers the exhibition on the first floor but the other ones are a new experience for him. He sometimes asks questions

about the finishing of a space. For example in space 3 (Académie), the ceiling consists of wooden beams with acoustic panels in between. He notices the acoustics are totally different than in a room with a concrete ceiling. The finishing of the ceiling helps him to orient himself in the volumes. Sometimes spaces are cut off for the public by means of a string, *e.g.* the second floor of Vander Kelen House (Figure 164) and space 31 (small tower). These are elements he does not notice and we have to make him aware of this signage. Also colours and interior change according to the exhibition. For the exhibition about Pieter Josef Verhagen some colourful carpets are placed on the ground in spaces 15, 16, 17 and 18. Charlotte does not have problems with this (Figure 165), but she considers them unnecessary. She notices you do not have to walk over the carpet, because it does not cover the whole floor. In her personal opinion it is more beautiful to show the parquet floor instead of covering it with a carpet. Although the physically impaired user/expert does not really value the colours, colours can be very useful for the user/expert with a visual impairment. He remembers the exhibition about Rogier van der Weyden. All the spaces were painted a different colour referring to the subject of the works of art, *e.g.* a space about passion was painted red. He appreciated these colours very much because he could easily distinguish the spaces by means of the colours. Space 20 (Académie) is completely painted orange (Figure 166); he is able to recognize the colour. He prefers coloured spaces because the contrast is better. Nowadays the spaces of the second floor of the long volume (23, 24, 25 and 26) are white. Because of the lack of colour he has difficulties finding the doorway. Luckily he remembers them from previous exhibitions but otherwise it would be difficult for him. Stad Leuven (2009d) mentions something about the application of colours: "*Surprising emphasises of colour are applied on different spots. These (con)temporary colours not only serve to clarify the different themes, but also help the visitors to orientate themselves inside the buildings*".

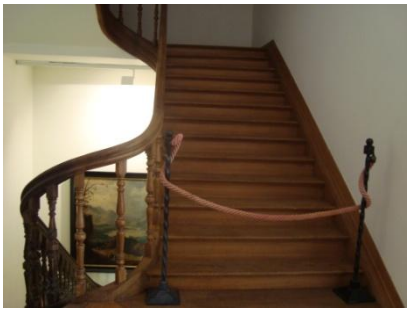

Figure 164 Zone cut off for Public

Figure 165 Colourful Carpet

Figure 166 Colourful Walls

"*During the walk through the exhibitions there are several surprises, for example the connection between the long volume and the Académie via the roof*" (Dubois 2009). The exhibition is not only situated inside the building but it can also be situated in the outside spaces of the museum. There is a public plaza next to the entrance and a roof terrace as part of the second floor. The architect considers the public plaza as a transition zone between the city and the garden. He mentions this plaza does not have a specific function, it only acts as transition zone. The professional literature talks about this plaza as follows: "*In purely Miesian tradition, a terrace, an 'urban stage' is born which raises above street level, but still has a strong visual relationship*

with the street" (T'Jonck 2005). The roof terrace is only accessible as part of the exhibition track, *i.e.* when you have a ticket. It is possible that some works of art are shown in these outside spaces. Liefooghe (2010) talks about exhibitions on the public plaza: "*a stage for sculptural performances, like the presence of the two concrete light eaters already suggest*". The architect suggests that valuable pieces probably will be exposed on the roof terrace. On this roof terrace there is also a covered zone; the architect thinks this zone can be the used for exhibitions. Dubois (2009) sees a comparison with the solution of Henry van de Velde for the terrace of the University Library of Ghent. The architecture guide says that until now no exhibitions took place in the outer spaces. The roof terrace is discussed under 'Context'; the white material of the roof provoked some comments from our consulted user/experts. The covered zone (Figure 167) was not immediately perceived by the visually impaired person. Filip saw a grey plane on the floor and he was no longer able to see the Central Library, so he had to ask for information. We explained him the covered zone blocked off his view. Filip mentions the roof terrace is an essential part of the exhibition track (Figure 168). The physically impaired user/expert agrees (Figure 169). The architecture guide usually ends her visit on the roof terrace and does not visit the spaces 28 (Académie) till 31 (small tower). She thinks it is too exhausting for a person with an impairment to visit the whole building. While we visited the museum in the company of the user/experts we did not notice any complaints about the extensiveness of the exhibition.

Figure 167 Covered Zone

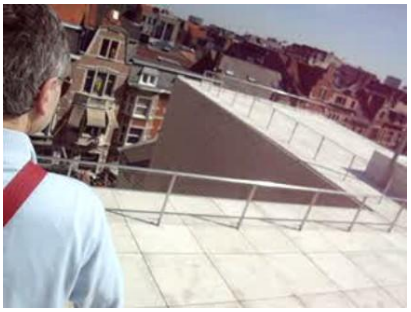

Figure 168 Filip at roof

Figure 169 Charlotte at roof

During the visits the user/experts made some remarks on the content of the exhibition. In most of the spaces Charlotte is able to fully experience the museum. The paintings most of the time at an excellent height for her (Figure 170), for example the works of art in space 5 (Académie) are well positioned in her opinion. Sometimes she feels really bad during a visit of a museum. Very often the objects are placed too high for her, for instance the books of space 7 (Vander Kelen) cannot be viewed by her because of the height (Figure 171). She does not understand this kind of obstacles; actually the museum organisation just has to make a small effort to make it comfortable for persons in wheelchair, but also for children, short persons,... Also Filip takes heed of some aspects of the museum. He already attended a visit of this museum specifically for persons with an impairment, but they were not allowed to touch objects. He thinks in other countries it is more common to touch works of art. He always carefully approaches an object as closely as possible. Some of the objects are placed behind a glass volume and sometimes he is surprised by the glass. In space 10 (Vander Kelen) he approaches an object but suddenly he bumps against

the glass (Figure 172). He makes jokes about it but it is clear that the museum management did not pay attention to the experience of visually impaired visitors. He is aware of the fact that this is part of the museum layout and it is unrelated to the architecture of the Museum site.

Figure 170 Excellent Height

Figure 171 Too High

Figure 172 Glass Volume

The architect is still very happy about the museum and about the exhibition spaces. The staff of the museum is satisfied too, the architecture guide confirms. When Museum M was recently opened, a lot of groups visited the museum. She thinks the acoustics of the exhibition spaces are excellent but maybe some spaces are too small for receiving two or three groups at a time. Charlotte thinks the museum is very spacious and she can easily move around everywhere, in her opinion the size of the museum is a quality. Filip interprets this spaciousness as emptiness, during the visit he has the impression the museum is actually too large for its content.

CENTRAL SPACE OF THE SITE – "*The public garden is the municipal chamber, the buildings are the furniture*" (De Rynck 2009).

The Museum site is interpreted as a municipal chamber with old and new furniture, the architect explains. "*Like pieces positioned on a chessboard, new and existing elements are arranged around a tranquil courtyard garden*" (Slessor 2010). One piece of antique furniture is the tree in the garden (Figure 173), the architect mentions. It was no obligation to keep the oak tree but Beel opted for its conservation. As mentioned above, an important aspect of a museum is routing. Several windows provide a view over the central garden and the tree. By watching the garden and the tree (Figure 174), visitors have the possibility to orientate themselves inside the building.

Figure 173 Oak Tree

Figure 174 Garden

Filip often makes the comment that he can see the tree in the garden (Figure 175), for instance from space 4 (Académie). He appreciates the conservation of the tree by Stéphane Beel. Charlotte says that she likes the views over the garden (Figure 176) and over the city. Sometimes she has difficulties seeing the garden because of the height of the window. In these cases, however, she can still see the oak tree, for example in space 29 (Académie).

Figure 175 Filip sees the Tree

Figure 176 Charlotte watches the Garden

The garden itself consists of a grass plain, contains a few benches, the old oak tree, lighting elements and a path through the garden. The architecture guide tells us that the garden is visited regularly, mainly by students. As Louvain is a typical city for students, that is only logical. A journalist says: "*The garden of the museum (..) stays a place of rest and greenness in the heart of the city*" (De Rynck 2009). Charlotte thinks the garden is a bit empty, in her opinion there should be flowers. Afterwards she mentions this is her personal opinion and she thinks flowers perhaps would not suit the modern building.

An ordinary path winds through the garden. The architect mentions the surface of the path is rough, in contrast to the finish of the entrance. Here rough finish is necessary because of the possible contact with water and the path is the only place to walk next to the grass.

From the garden it is possible to enter the Antichambre. There is a staircase and a ramp (Figure 177) because of the difference in level between Antichambre and garden. The architect announces these flight of stairs and ramp are the opposite of the ones of the main entrance: here you have a long ramp and a short flight of stairs. Usually the user with a visual impairment prefers a ramp but at the moment of our visit many children were playing on the ramp. He does not mind to take the stairs but he was surprised. He thought this flight of stairs would have the same rhythm as the one at the entrance. When going back to the Antichambre, he takes the ramp (Figure 178). At this moment he mentions ramps are actually foreseen for wheelchair users but he also makes use of them. He likes to follow the banister and prefers the gradual descent of the ramp. Charlotte highly appreciates the ramp too.

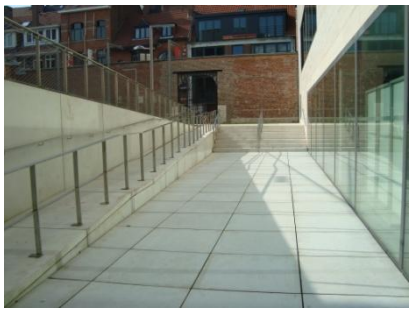

Figure 177 Ramp and Staircase

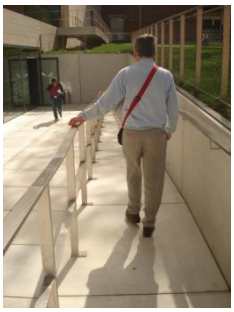

Figure 178 Filip prefers Ramp

A little obstacle they both experience is the transition between the Antichambre and the garden. Just as the transition between the entrance and the Antichambre, there is a glass volume. The doors do not open automatically and both user/experts consider these doors as physical barriers. Charlotte needs to ask her companion to open the door, afterwards she can continue herself (Figure 179). Filip has troubles finding the door because it is not visible enough. They both prefer automatic doors in this case. The professional literature makes a critical comment on the garden: "*It is a pity (..) the courtyard garden has rather become a transition zone than a space with residence quality*" (Wijle 2010).

Figure 179 Glass Volume

LIGHTING – "*The visitor of Museum M is guided from one spot of light to another*" (Beel 2009).

In the architecture magazine El Croquis, Stéphane Beel talks about his way of designing: "*I am not in the first instance concerned with the outside of the things, but the outside is certainly important in the sense that it speaks a particular language*" (Marquez & Levene 2005). This sentence does not refer to Museum M in particular but it seems to apply to it too. During the interview, the architect confides to us that they usually design a building from the inside. For this design they added two new volumes on the site. At certain points they decided to extend the volumes, for instance to the portico. These extensions are made with great views in mind: the Central Library, Sint Pieters Church, Sint Michiels Church, City Hall,.. The professional press writes about one of the extensions: "*The volume gets an extra tall level at the Savoyestraat, in this way the volume is like a observation post for the city*" (Liefooghe 2010). The concept of routing is important for the architecture office of

Stéphane Beel[34]. Windows are conceived on well-considered places, in the published literature we read: "*Along the exhibition track you can perceive the city and perfectly framed views of the other parts of the buildings*" (Stad Leuven 2009d). Sometimes a window provides a view over the city, sometimes the visitor can catch a glimpse of the garden. In architectural magazines these views are commented on: "*These large urban 'paintings' provide a view on the University Library, the towers of the City Hall but also on the banal back of the urban buildings. These views are not only esthetical sights of the monuments of the city, but also uninteresting sights are present*" (Dubois 2009). Another architecture critic writes " *(...) even roofs made of sheets of corrugated material are shown to the visitor, because these roofs are also part of the city!*" (Wijle 210).

The architecture guide recommends to show the windows and the views to persons in a wheelchair. During the visits in the company of the user/experts we notice they spontaneously pay attention to the windows; we do not have to make them aware of the views. Even when there is a statue in front of the window (Figure 180), Filip tries to get closer to catch a glimpse of the view, for example in space 4 (Académie) to see the tree. The views on the garden are appreciated by him as well as the views on the city, for instance in space 23 (long volume) where there is a view to the *Vanderkelenstraat* (Figure 181). In space 25 (long volume) he asks whether it is possible to see the City Hall because he remembers this magnificent view from another visit. When we are in space 27 (long volume) he notices he had this view on the City Hall in mind. The professional literature mentions: "*In the belvedere with a view on the City Hall (..), the exhibition of the city is unmistakable*" (Liefooghe 2010). In space 24 (long volume) he notices daylight penetrating into the building and suddenly he is going closer to the window. The views also appeal to Charlotte. When we confronted Filip with the concept of walking from one spot of light to another he did not know immediately if it was accurate. But considering their reactions during the visit the concept apparently seems to work. The professional literature adds: "*The visitor can walk from one spot of light and view to the other and constantly orientate himself. In this way a fascinating interaction grows between the pieces of art and the city itself*" (Pelgrims & Winnen 2005).

Figure 180 Statue in front of a Window

Figure 181 Enjoying the View

[34] See 'Context', p.92 and 'Central Space of the Site', p.110

Although Filip is generally positive about the views, he does make some negative remarks. Because of the exhibited works of art the organisation of the museum took measures. For example in space 1 (long volume) the window is darkened (Figure 182). Filip is able to see the blue colour of the sky but he can perceive nothing else. In other spaces the windows are totally blacked out, the architect explains, for example the windows of space 3 (Académie). In that case the architect thought the view as interesting but the organisation decided not to show it. The architect admits whether the windows are darkened or not depends on the exhibition. The visually impaired user/expert confirms this fact several times. Filip thinks the window of space 23 (long volume) was darkened during the first exhibition because he does not remember the view. Also in space 25 (long volume) he guesses the windows were darkened at the beginning. Because of the windows the museum is now a total different experience for him (Figure 183).

Figure 182 Darkened Window

Figure 183 Filip in front of a Window

Charlotte also makes a remark about the windows. Sometimes they are too high for her (Figure 184), for example space 29 (Académie). Sometimes a statue in front of a window restricts her to enjoy the view, for instance space 4 (Académie). But in general the experts appreciate the windows. Several windows provide an excellent view for her (Figure 185), *e.g.* the window of space 24 (long volume).

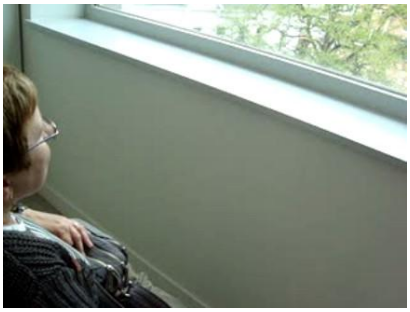

Figure 184 Too High

Figure 185 Excellent Height

As mentioned earlier, the architect cut out windows on well-considered places. Marc Dubois (2009) mentions about Stéphane Beel: "*He knows very well how to dose daylight and artificial light in a controlled way*". Another remark on the application of light is made by Liefooghe (2010): "*In none of the spaces the architect applied zenithal light*". This statement is true for the exhibition spaces but does not apply to the whole museum. "*Both auditorium and concourse are illuminated by what Beel describes as 'light eaters', large openings carved into the ceiling*" (Slessor 2010). When

the user/expert with a visual impairment visits the auditorium he mentions the 'light eater'. From a previous visit he remembers a lot of daylight because of the 'light eater'. Because he does not perceive any daylight he guesses it is broken. Actually the light eater is not broken only covered with a black foil. The architecture guide explains the light eater is considered as a 'mistake' by the architect. The auditorium is often used for PowerPoint presentations, in which case daylight is useless. She thinks the 'light eater' is quite useless for an auditorium.

In Filip's opinion, daylight in a building is always a quality. In this museum there is enough daylight and the views are well positioned. Charlotte also likes the views. Although the architect tells us that the views have to help persons to orientate themselves inside the building, the user/experts do not experience them in this way. Filip is not totally sure about this function and to test it he has to visit the museum by himself. Charlotte likes the views but these views do not help her to orientate herself on the Museum site. In the opinion of Filip this is not a bad thing because otherwise the building would be immediately transparent from the first visit. For him a building which gives itself away from the first visit is a boring building.

Chapter 4: Confrontation

Chapter 4 compares the insights gained in the two case studies reported in Chapter 3, and confronts them with insights from related work. Chapter 3 focused on the individual case studies of the museums: for each museum a general description of the building interior and exterior was given, followed by an analysis of different perspectives. For both buildings we compared different parts of the concept created by the concerned architect with the experiences of the user/experts and other persons who are involved in the museum. Both case studies are analysed by following a similar structure of which permits to compare the gained insights. The purpose of Chapter 4 is to make a mutual comparison between the two case studies and a comparison of the case studies from the literature study. To establish this confrontation we now make use of the classification of the senses introduced by Hochberg (1972) and extensively explained under Chapter 2. This classification permits a discussion of all the aspects of the multi-sensory experience of the two cases studied in this thesis. As under Chapter 2, we want to stress the fact that the senses do not need to be considered in isolation, but rather as an amalgamation of the senses (Malik 2006). Still, we will discuss the experiences under the sense to which they relate to most.

The Distance Senses

Seeing

A first aspect of comparison within relation to 'Seeing' is the overall appearance of the building. The façades of both museums are made of light-coloured stone materials. The Pavilion of Knowledge in Lisbon is covered with a white limestone showing a variety of maritime fossils (Perrault 2000). The choice for this kind of material is attributed to the theme of Expo '98, *i.e.* the Oceans. In Museum M in Louvain the material of the new volumes is travertine. Marc Dubois (2009) observes in the application of travertine a reference to the work of Mies van der Rohe.

In Filip's opinion the presence of daylight is always a quality of a building. In the Pavilion of Knowledge almost no windows are foreseen. The user/experts did not

talk much about light, except in relation to the new window of the Foyer. This window was highly valued by all the consulted persons. Not so much the penetration of daylight was appreciated, but especially the visual connection to the ramp and the exterior. In Museum M the visitor is guided by "*the spots of light*" (Pelgrims & Winnen 2005). Judging from the experiences of both user/experts the concept seemed to work. Unconsciously, Filip and Charlotte were attracted by the windows. Not only the windows were appreciated by the user/experts for the views and the daylight, also the glazed bridges between an old and a new volume were.

Usually the presence of daylight is considered as positive. Yet, too much sunlight is not appreciated. Especially excessive sunlight in combination with the applied materials is rather inconvenient. On the roof terrace of Museum M, a lot of sunlight was reflected by the white material of the floor. The same effect can be perceived at the entrance, this was also noticed by both user/experts. Charlotte and her companion did not consider it as pleasant (Figure 186). On the roof, sunlight provides a certain pleasurable feeling of warmth[35], but at the same time it prevents enjoying the view. Filip also disliked the strong sunlight and its reflection, because for him too much light makes using his residual vision impossible (Figure 187). Charlotte and her companion went to the part of the roof terrace with shadow. This part of the roof was also noticed by Filip. At first he was not sure whether it was in shadow or made of a black floor material.

Figure 186 Charlotte at Roof

Figure 187 Filip at Roof

Next to the materials and daylight, the position of the entrance is also part of the general appearance of the building. In Louvain the user/experts easily found the main entrance of the museum due to the presence of the portico as it is an international symbol of a museum. Both in Louvain and in Lisbon the Museum site has different entrances. In Museum M the function of every entrance is well-defined (urban, cosy and informal) and the user/experts obviously found it very clear. In the Pavilion of Knowledge the consulted persons experienced more problems in finding the right entrance. The entrances definitively are not very clear and the signage seems to be inadequate.

After entering a public building the visitors are preferably guided to the reception by the architecture (Froyen, Herssens & Heylighen 2008). This article underlines the

[35] See 'Thermal Comfort', p.127

necessary relationship between the entrance and the reception. In the Pavilion of Knowledge Tiago regretted there is no visual connection between the ticket office and outside. We have to admit we would have preferred a visual connection too. When we visited the Pavilion for the first time, it was not very clear if the museum was open or closed. For finding the ticket office itself Tiago continued following the wall. In the Van Dale College the blind person was also able to find the reception by herself because of the logical position close to the entrance (Heylighen *et al.* 2010b). In Museum M Filip remembered the former ticket office, but thought the new ticket office is located at a logical position. The new ticket office is a barrier for the wheelchair users because of its height. On the other hand, the previous ticket office of M is lower and was therefore better for Charlotte. Visitors have to take either a few steps or a ramp to reach it. Charlotte suggested to cut out a part of the new ticket office so that one part of the desk is at her height. This solution is applied in the Pavilion of Knowledge. The design fits in with the pro-children policy and of course persons in wheelchairs take advantage of it.

In both museums there is a space before the exhibition starts, respectively the Foyer in Pavilion of Knowledge and the Antichambre in Museum M. The exhibition starts behind these spaces. In the Pavilion of Knowledge the starting point of the exhibitions is very clear. In the Foyer it is indicated by the ticket machine (Figure 188) because from here on the visitors need to pay. By contrast, the starting point of the exhibition spaces in Museum M is not really obvious. Charlotte has never visited the museum before and had to wander before finding the signage 'START' near the staircase in the middle of the Antichambre (Figure 189). Because Charlotte is a wheelchair user she needed the elevator, but we did not find any signage for the elevator. We suppose the staff of the museum will mention the location while buying tickets.

Figure 188 Ticket Machine

Figure 189 'Start'

Some aspects of the museums seem to be provided for the 'standard' user only and cannot be enjoyed by all the users. Charlotte mentioned that she was not able to enjoy certain views of Museum M because of the height of the windows. Inside the building she was not able to look downstairs at the void, but she understands that a high banister is necessary because of safety regulations. She appreciated the acoustic effect just as Filip did. In the Pavilion of Knowledge the banister in the Nave also has a certain height because of safety reasons. Unfortunately, one side of the banister is translucent and the two other sides are transparent. None of the consulted persons understood the underlying reason of the translucent banister,

even the architect did not remember the reason anymore. It is logical that the banisters have a certain height, but it would be more interesting for children and for persons in a wheelchair to have all transparent banisters.

Persons with a visual impairment are not able to perceive transparency (Herssens & Heylighen 2009). For blind visitors of Museum M the glass walls are thus probably not significant. As they are not able to perceive transparency, these kind of walls might as well have been opaque. By contrast, for a visually impaired visitor these glass walls are even considered as extra barriers. The glass walls of Museum M now have white stripes (Figure 190) on it to draw the visitor's attention. However, Filip was not able to perceive the wall at the entrance (Figure 191). Some of the objects of the museum are placed in a glass box (Figure 192) to protect the works of art. Out of habit Filip tried to get as close as possible to an object, yet he suddenly bumped against the glass.

Figure 190 White Stripes

Figure 191 Glass Wall Entrance

Figure 192 Glass Box

Some elements of a design may have been chosen for visual reasons only (Malik 2006). An example of this visual emphasis is a grey painted wall noted by Butler and Bowlby (1997). Grey is not easily perceived by persons with a visual impairment. During the visit to Museum M Filip pointed at the contrasts in colour. One exhibition space was painted orange and he was able to perceive the colour. He liked the variety of colours and the involved contrasts. During the exhibition about Rogier van der Weyden all the spaces in Museum M were painted a different colour, for him these colours made it easier to distinguish the spaces. Contrast can also contribute to the visibility of a staircase. As Butler and Bowlby (1997) suggest that steps without clear edges are difficult for persons with a visual impairment. In the Pavilion of Knowledge the accessibility employee made a lot of effort to create more contrast by putting white lines on the steps. Filip also pointed at the visibility of the stairs in Museum M. The stairs and ramp of the entrance looked like one white plane to him. Not only the person with a visual impairment had troubles with this, Charlotte and her companion did not perceive it very well either. At the bottom of a staircase the various steps are more clear than at the top of a staircase. This aspect is mentioned by Charlotte and her companion in relation to the entrance. Filip admitted he prefers going up the steps to coming down the stairs because of the better contrast in the first case.

Another point for comparison between the two case studies is the designing process. The consulted architect of Museum M mentioned that Stéphane Beel mostly designs

a building from the inside out and not only for the aesthetical view from the outside. The windows of the museum are directed at interesting sights of the city (City Hall, Sint Michiels church, Central Library,..) and even uninteresting ones (roofs made of sheets of corrugated material) (Dubois 2009). The concept of routing contributed to the well-considered locations of the windows. On the other hand, the Pavilion of Knowledge seems to be primarily designed from the outside. The overall effect of the building is a megalithic cross (Perrault 2000). The inside of the building is conceived as white sheets on which exhibitions could be displayed (Fernandes & Cannata 2001). Carrilho da Graça confided us that during the conception phase he knew the Pavilion would become a museum after Expo '98, but he was not aware of the exact exhibition content of it. The Pavilion of Knowledge puts emphasis on the experience of the icon, Museum M focuses on the experience of the exhibition track.

The Pavilion of Knowledge is a completely new construction, Museum M is a composition of old and new volumes. Taking existing volumes into account obviously has consequences for the lay-out of the site. In Museum M a typical exhibition track is established to guide the visitor through the old and new volumes of the Museum site. To put emphasis on the transition between an old and a new volume Stéphane Beel usually made use of small bridges. Through the various windows and glazed small bridges the visitor regularly catches a glimpse of the old oak tree in the central garden. This concept of routing should help the visitors orientate themselves inside the building, but Charlotte and Filip were not really sure these views could help them in orientating. We have to admit that we too had to visit Museum M a few times before the lay-out was totally clear. In the Pavilion of Knowledge almost no windows are created[36], so views cannot help the visitor to orientate himself. The management of the Pavilion marked the way to the different exhibitions by means of coloured lines on the floor. In the opinion of the accessibility employee the Pavilion does not offer a typical exhibition track because this type of museum does not require this, unlike an art museum as Museum M. The user/experts who visited the Pavilion agree to this idea. Tiago does not like an exhibition track at all, Sofia thought the lay-out inside was very clear in contrast with the outside of the Pavilion.

The sense of 'Seeing' can serve the visitor to easily find and recognize certain spaces. In Museum M the visitor recognizes the international symbol of a museum and therefore finds the entrance. When there is a visual connection between the exterior and the interior, the visitor can verify whether the museum is open or closed. The beginning of the exhibitions is in both museums marked by a visual element. Inside the exhibition, visual information is often used to guide the visitor through the spaces. The presence of (day)light stimulates the perception of spaces, unless there is too much reflection. Through the sense of 'Seeing', the visitor gets an idea of the esthetical qualities of a building. Unfortunately, when people experiences problems with 'Seeing', some elements are unnoticeable to them.

[36] See 'Lighting', p.67

Hearing

Sounds can help to locate certain places, as in the Van Dale College the visually impaired persons is able to find the reception because of the sound of traffic outside (Heylighen *et al.* 2010b). In the neighbourhood of Museum M cars are expelled out of the city centre[37]. The elimination of cars in the proximity of M implies that visitors have to traverse a longer distance from the parking or bus stop to the museum, but the user/experts are both satisfied with this location. The visitors of Museum M with a visual impairment cannot orientate themselves by means of the sounds of the vehicles. In the opinion of Tiago, the blind user/expert visiting the Pavilion, this is even an advantage. In the course of years the Park of the Nations has been drastically changed and now cars have access to the park[38]. He thought this solution as quite dangerous for visually impaired persons and children. On the contrary, Sofia liked the allowance of cars and therefore the proximity of parking places.

Not only traffic sounds are potential sources for orientation. Also human activities as people talking can contribute (Dischinger 2006). On the way to the Pavilion of Knowledge the blind user/expert took notice of the sound of people running errands at the supermarket Continente. On top of the ramp Tiago could find the reception by means of following the wall and of hearing voices of students who have just entered the entrance hall. The entrance of Museum M provides a special feeling to the attentive listener. Filip explained it as follows: "*You can still hear the city while standing on the stairs, but actually you leave the city behind. You have already entered a little bit but not yet completely".* Sources of human activities can help the visually impaired visitor situating and entering the building.

Next to sounds caused by human activities, natural sources of sound can be helpful as well. An example is the sounds produced by animals which can guide the visitor to the zoo. Dischinger (2006) already suggested that the sound of running water or moving leaves of a tree can be guiding. In the proximity of the Pavilion itself Tiago paid attention to the sound of the fountain.

Inside the museums the sounds also play a major part for the visitors. As Mellaerts (2007) talks about the City Hall in which footsteps on the stone floor resound on the wooden ceiling. In Museum M, the materials of the floors and ceilings are noticed by Filip. He also made us attentive to the sounds which the materials reflect. Next to the visual variety of the succession of old and new volumes, there is also an acoustic variety in the spaces. Filip indicated the varying acoustic effect of old and new volumes, rectangular and square spaces, high and low rooms,... In the Pavilion of Knowledge Tiago also observed the changing acoustic effect of the spaces, especially while walking from a low space (*e.g.* Casa Inacabada) to the high space (*i.e.* the Nave). The acoustic effect of the Corridor, coming from the Entrance hall to the Foyer, was

[37] See 'Location and Transport', p.71

[38] See 'Location and Transport', p.32

also very interesting in Tiago's opinion. Both visually impaired user/experts appreciate the varying acoustic effect of the interior.

Inside the low spaces of the Pavilion of Knowledge, it was sometimes hard to understand the accessibility employee. She blamed the noise to the fact that this Pavilion is an activity museum. Tiago thought that the reason for the noise lies in the poor acoustics. In some spaces measures are taken (*e.g.* the acoustic panels in Casa Inacabada) but they seem to be unsatisfying for this type of museum (Figure 193). Stéphane Beel paid a lot of attention to the acoustics of Museum M (*e.g.* the acoustic plaster in the Antichambre or the curtains and carpet in the auditorium) (Figure 194) and both user/experts and the staff seemed to be pleased.

Figure 193 Casa Inacabada

Figure 194 Auditorium

Before the visits to the respective buildings both user/experts with a visual impairment mentioned they remembered a particular sound of the museum. Tiago remembered the sound of the water in the middle of the ramp of the Pavilion of Knowledge. When he arrived at the Pavilion, the sound of the water was as loud as he remembered. He noticed the sound from the Olivais Dock and it was useful to locate the Pavilion, but walking up the ramp the water was not very guiding for him. Similarly, Filip remembered the void in Museum M. While being in the proximity of the void, the acoustic effect was not like he had imagined. These two memories of sound suggest that visually impaired persons attach great importance to sound. Sofia and Charlotte did not visit the museum before, so we are not sure that they would pay attention to memories of sound. Judging from the experiences of Tiago and Filip, visually impaired visitors obviously seem to search for sound as a point of recognition.

Next to visual elements for recognition mentioned under 'Seeing', there are beneficial auditive characteristics as well. These recognition facilities of the case studies are originating from human activities (*e.g.* people talking, vehicular traffic,...) or natural sources (*e.g.* running water, whistling birds,..). The examples go to show that 'Hearing' can play an important part in the people's memory of a space. Next to a visual approach of the aesthetics of a space, there is also an auditive approach. If a space has good acoustic qualities, the space is experienced as enjoyable. If the acoustic qualities are poor, the space is considered as rather unpleasant. A well-balanced succession of different kind of spaces and related acoustic qualities is considered as comfortable, *i.e.* the equivalent of 'beautiful' in a visual approach.

The Skin Senses

Touch

Visually impaired persons often use a white cane (Dischinger 2006). On the way to the Pavilion Tiago mentioned that he liked the variety of the materials. Two ground materials are used in the Park of the Nations, *i.e.* wood and cobblestones (Figure 195). By touching the ground with his white stick and the matching sound, Tiago became aware of the ground material. Filip, the user/expert visiting Museum M, is not completely blind. He mentioned he does not always use his cane, especially not in spaces where he is used to walk or when he has many other objects to carry. He uses the white cane to warn other persons, especially motorists. Butler and Bowlby (1997) wrote about the same issue, *i.e.* the white cane as a symbol. Persons in a wheelchair can touch the ground through the wheels of the wheelchair. In the Pavilion of Knowledge Sofia had troubles with the carpet in the entrance volume (Figure 196). In Museum M some of the exhibition spaces also have carpet on the floor. This kind of carpet did not causes obstacles for Charlotte, but she mentioned other carpet often does. In this museum the carpet does not cover the whole space, so there is still space to avoid it. For the Pavilion of Knowledge Sofia suggested to divide the space into two parts: one side with carpet, the other side without carpet. On the other hand, Charlotte wondered what is the surplus value of the carpet in these spaces...

Figure 195 Cobblestones and Wood

Figure 196 Entrance Volume

The finishing of the materials is also important for the visitors. As Carlos Mourão Pereira suggests round shapes instead of sharp edges (Vermeersch & Heylighen 2010). Tiago also appreciated the round finishings of the exhibition contents in the Pavilion of Knowledge. The finishing of the walls in the auditorium was rather unpleasant in his opinion because the surface is not soft at all. The accessibility employee mentioned that many people are astonished by touching the extremely rough finishing. In Museum M also attention is paid to the finishing of the walls. Filip showed special interest in the finishing of the old volumes of the Museum site. In these old volumes the walls have a lot of decoration which can be touched. Just as the sound of the volumes he highly esteemed the variety of the old and new volumes and the corresponding tactile experiences. Mellaerts (2007) points out that every stone has a typical hardness, colour, warmth and mode of fabricating. Tiago said something similar about stones at the beginning of the visit. He mentioned that the finishing of the stone can change our perception of it. While walking on the ramp he

noticed the difference in the finishing of the ground material, *i.e.* a rough finishing versus a smooth finishing (Figure 197). During the visit to Museum M Filip was also interested in the types of stones. At the entrance he touched the pillars which are made of stone (Figure 198). By touching the pillars he felt an engraved date and the warmth of the stone. In his opinion people generally think stones feel cold, but he mentioned that it depends on the stone. Touching the materials can provide a more interesting experience.

Figure 197 Smooth and Rough Surface

Figure 198 Pillar

To explore the whole building Mellaerts (2007) suggested a walk around the complex. During the visit to the Museum site in the company of Filip, he suggested a walk into the garden to become familiar with the old and new buildings. In his opinion it was very interesting to touch the materials of the façades. Filip also made a suggestion about a model. He thought the museum should offer a tactile model to all the visitors. Visually impaired visitors would be very pleased to discover the site in advance by touching the model. Tiago already knew the Pavilion of Knowledge very well, so he did not need a model of the museum.

Another tactile aspect which Tiago appreciates very much when discovering public buildings in general, is the presence of a banister through the whole building. In a paper, Pereira (2010) proposes a modular and portable orientation handrail. On the spots of the Pavilion where a banister was provided, Tiago preferred to follow it. Tiago does not believe in guidepaths for a museum because the area is too small, in a larger area as the Oriente Station in Lisbon[39] it could be useful. In Museum M Filip was very pleased with the provided banisters. A banister of a staircase which does not start at the first step or not end at the last step (Figure 199) is dangerous (Froyen, Herssens & Heylighen 2008). In Museum M Filip thought the present banisters are very good, except for the one at the entrance. At the entrance Filip experienced problems to find the next banister. These examples illustrate that banisters are really necessary in public buildings.

To move inside the building also elevators are of great importance, as will be discussed under 'Motion'. For visually impaired people the buttons in an elevator are best placed underneath each other because an elevator moves vertically (Froyen, Herssens and Heylighen 2008). In Museum M, the buttons of the levels are placed

[39] See 'Location and Transport', p.32

vertically. Yet, for each level there are two buttons because the elevators always has two possible exits (Figure 200). This is an extra difficulty for the visitors as mentioned by Filip and Charlotte. Persons in a wheelchair usually do not prefer vertically placed buttons because they sometimes are not able to reach the upper button. As Vredenburgh (2010) noticed, the preferred locations of buttons usually are higher for standing persons than they are for wheelchair users. In the Pavilion of Knowledge and in Museum M, none of the user/experts made a comment about the height of the buttons. Both heights seemed to meet the visitors' needs. By contrast, the user/experts made comments on the signage of the elevator. Tiago did not like the signage of the levels, *i.e.* small numbers and numbers in Braille. He preferred a more inclusive solution, *e.g.* larger numbers in relief. The signage in the elevator of Museum M was more extensive as there are more levels and exits. Therefore, the signage was considered as complicated by the consulted user/experts.

Figure 199 Banister which Ends at Last Step

Figure 200 Elevator of Museum M

Another aspect of the museums related to 'Touch' is the content of the museums. The Pavilion of Knowledge requires more touch than Museum M does. The Pavilion of Knowledge is particularly directed at children and their families to try out all kind of activities (Figure 201). Museum M is an art museum (Figure 202), the content obviously appeals more to 'Seeing' than to 'Touch'[40]. Heylighen *et al.* (2010a) noticed that blind persons consider the movable objects (*e.g.* of an exhibition) as part of the whole. This might apply to objects exhibited in a museum as well. Although this thesis focuses on the experience of the architecture, the kind of museum has to be taken into account as well.

Figure 201 Activity Museum

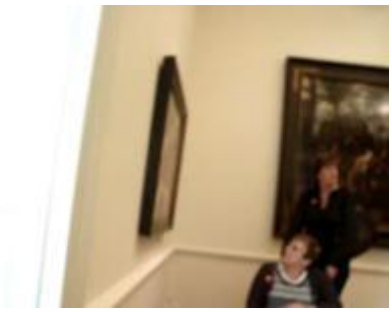

Figure 202 Art Museum

[40] See 'The Senses', p.17

The sense of 'Touch' can be applied to focus on one particular object or to explore a whole site. By focusing on one object, the user/experts pointed at the finishing of the materials. Some elements of the buildings need to be within reach of the user, *e.g.* the buttons of an elevator. By contrast, some elements are not allowed to be touched. The possibility of touch often depends on the content of the museum. To explore a whole site, one can touch the walls or follow a handrail. This kind of 'Touch' is strongly related to 'Motion'. Sometimes persons do not touch by the fingers or skin, but they make use of a tool (*e.g.* a cane or a wheelchair).

Smell

Smells can be pleasant, neutral or awkward. Mellaerts (2007) took notice of the smell of one of the halls in the City Hall. Here the smell of the timberwork could be experienced. In Museum M Filip asked a question about the ceilings in one of the spaces of the Académie. He guessed the ceiling is made of wooden beams because of the reflected sounds and partly because of its smell. This is the only space of the museum where he said something about the smell. Before the visit to the Pavilion of Knowledge Tiago mentioned that smells do are important, but he did not remember particular smells of the Pavilion. During the visit he did not make comments on the smell. After the visit he mentioned he does not want to bring something up about the smell because in general the smells were satisfying. None of the physically impaired user/experts made a comment on the smells. Maybe sounds are better impressed in one's memory than smells. Or do we not really notice neutral smells, only pleasant or annoying smells. In that case we can conclude the smells of both the buildings are not striking.

Thermal Comfort

Under 'Seeing' sunlight is explored as a visual quality, but the presence of the sun is also a thermal characteristic of a space. Vermeersch and Heylighen (2010) mention that the presence of direct sunlight may provide a totally different experience of a space to the visitor. As Filip said that daylight is always a quality of a building, he also appreciates the warmth of the sun. Inside the glazed bridges for instance, Filip noticed the heat of the sun (Figure 203). Too much sunlight is not appreciated for visual reasons[41], but too much heat is not desired either.

[41] See 'Seeing', p.117

Figure 203 Glazed Bridge

Museum M is an art museum and therefore requires a controllable balance of temperature, relative humidity and dosage of light. According to 'RCR Studiebureau' (2011), the office responsible for the climate installation, the temperature oscillates between 20 degrees in winter and 24 degrees in summertime. The relative humidity is at a constant level of 50 percent. The office affirmed that these values also take into account the visitors' comfort and the energy costs. The Pavilion of Knowledge is an activity museum. The exhibited objects do not demand a typical climate for protection of the objects. Probably the temperatures can also be controlled, but it does not seem to depend much on the space. Smaller low spaces were experienced as warm, the high space of the Nave was much cooler. The temperature of the space appeared to depend on its size.

As noted in the literature study, the variety in temperature is a tool for the visitor to detect the scale of the space (Malik 2006). In Museum M the visually impaired user/expert was conscious about the varying size of the exhibition spaces, but the effect was not as clear as in the Pavilion of Knowledge. Tiago suddenly experienced an enormous drop in temperature level, especially while walking from Casa Inacabada to the Nave. The bigness of the Nave probably explained the abrupt drop in temperature. In Museum M the temperatures are well balanced because of the objects of art, therefore the varying size is more a visual or auditory quality than a thermal one. In the Pavilion of Knowledge the variety in temperature definitively helped the visitor to get an impression of the size of the space.

Next to sunlight and temperature, also the wind has a strong influence on the thermal comfort. In the opinion of Dischinger (2006) the presence of wind can be positive, *i.e.* it can help persons to orientate themselves. In the Pavilion of Knowledge the wind was very helpful for a visually impaired employee. While walking in the Foyer and being in front of the corridor (Figure 204) the employee was able to experience a float of air. In that way the corridor and its breeze can serve as an orientation point. In Museum M the wind was manifest on the roof terrace above all. To reach the roof terrace visitors have to open a door (Figure 205). Behind this door the visitors became conscious they are outside because of the views, the sounds, the sun,.. and of course the wind. Additionally, Dischinger (2006) mentions, the wind can also be negative, *i.e.* it can mask sounds that are potential spatial references. Luckily, this kinds of experiences were not noticed in the two case studies.

Figure 204 Corridor

Figure 205 Entering Roof Terrace

Under the sense of 'Thermal Comfort' the experiences of temperature, sunlight and wind are classified. The presence or absence of daylight has a strong impact on the experience of a space. Due to sunlight, the volume of a space and the presence of persons, the temperature varies. In Museum M variations of temperature are not really possible because of the climate installation. The wind also has a strong influence on the comfort of a space.

The Deep Senses

Position

As Ziller and Smith (2005) point out that windows are often too high to provide persons in a wheelchair a view. The Pavilion of Knowledge has only one window which provides a view for all visitors, *i.e.* the new window of the Foyer. This window is very large and was at excellent height for Sofia, the wheelchair user/expert (Figure 206). Museum M has many windows, most of them are at good height for visitors in a wheelchair (Figure 207). Unfortunately, some of the windows are placed too high. Sometimes a statue even stands in front of the window, in that case the view is totally impeded for wheelchair users. Other visitors are able to walk behind the statue if they are interested in the view, as Filip sometimes did during our visit.

Figure 206 Window of Foyer

Figure 207 Window of Space 23

Davis (1987) uses a wheelchair herself and writes that she does not like reserved places for disabled people during events. Sofia and Charlotte shared this opinion, they also like to pick a place themselves in the neighbourhood of their friends or family. In the Pavilion of Knowledge wheelchair users can take place in the middle of the auditorium. In the auditorium of Museum M persons in a wheelchair have to sit

at the back of the auditorium. In both auditoriums these spaces are not especially reserved for persons with a physical impairment, but these zones can be used if necessary. This is the way both user/experts prefer it during events or lectures.

Unfortunately, not the whole auditorium is accessible for wheelchairs. In Museum M wheelchair users can only move around the seats and the stage. In the Pavilion of Knowledge persons with a wheelchair are only able to be at the back or in the middle of the auditorium. In both auditoriums it would be difficult for a physically impaired person to deliver a lecture. Also persons with a visual impairment do not always feel at ease to move through the whole space (Renders & Viaene 2006), unless there is a guidepath or an handrail to follow. This aspect is further explained under the next category 'Motion'.

Another facet which influences the position of a person inside a space, is the content of the exhibition. The exhibition spaces of the Pavilion of Knowledge were conceived as white sheets[42]. The exhibition spaces did not depend at all on the potential content of the Pavilion. In Museum M the architect created three different layers, each depending on one theme: the semi permanent collection is situated on the ground floor, the temporary collection is displayed on the first floor and the contemporary art at the second floor[43]. Stéphane Beel conceived three layers, but none of the layers is especially designed for one type of art. In the future, it is possible that the themes will change level.

The 'Position' of a person can vary both in horizontal and in vertical direction. Vertically, obviously there are limitations. We particularly notice the difference between standing persons and persons in a wheelchair. Horizontally, physically impaired persons are often forced to take place in special zones. Even more, persons in a wheelchair often have no access to all spaces of a building. Because of the content of an exhibition, visitors are sometimes encouraged to follow a certain track. In both vertical and horizontal direction, having no limitations usually is regarded as positive by the user/experts.

Motion

People using a wheelchair express that they feel excluded from all spaces where one has to get by stairs (Winance 2006). The physically impaired user/experts who participated in our case studies agreed with this fact. Sometimes Charlotte was not able to take the standard route to a space. When there was another possibility to reach that particular place, she felt relieved. Coming from one space of Museum M she could not enter the roof terrace because of the presence of stairs. In another space she could take the elevator and reach the roof terrace. When there is an alternative possibility for her, she does not bother about it. In the auditorium of the

[42] See 'Content of the Exhibition', p.60

[43] See 'Content of the Exhibition', p.103

Pavilion of Knowledge wheelchair users are not able to reach the stage by the regular way, they have to go round the back. While we would think that an alternative route for wheelchair visitors is not really comfortable, these user/experts generally did not seem to mind. They were already pleased if an accessible possibility was provided for them.

Anita, a wheelchair user, mentions she does not bother about steps or stairs (Blancquaert 2008). A remark of that kind is rather uncommon, for most persons with a physical impairment a small step makes a considerable difference. In the Pavilion of Knowledge the accessibility employee pointed at a small step of only four centimetres. She noticed that many visitors experienced troubles with it. Nowadays a small ramp overcomes the difference in level. At the entrance volume of the Pavilion of Knowledge Sofia experienced difficulties due to some small steps. In the Antichambre of Museum M there are three long steps and one ramp at the side. Filip mentioned that the steps are not very clear for him because of the lack of contrast. Charlotte remarked that she had to be careful too with the steps because she did not notice the steps at a glance. The ramp is rather narrow compared to the width of the stairs. Persons with a visual impairment often are rather sensitive to differences in level. While walking on the Museum site Filip mentioned the site is sloping. Similarly, the slope of the *Grote Markt* of Louvain is noticed by Mellaerts (2007).

In the case study of the Lotus Temple a visually impaired person says that he would have preferred a ramp instead of stairs (Malik 2006). The user/experts with a visual impairment involved in our case studies expressed preference for a ramp too. In the case of stairs, Filip often has difficulties with the distinction between the different steps. A ramp allows a more fluent movement while following its banister. Filip mentioned that older staircases often have a predictable rhythm in contrast to contemporary ones. A predictable rhythm is easier to follow, but still the lack of contrast is often a problem with all kind of stairs. In Museum M there are recent as well as older staircases. The new staircase of the entrance has an unpredictable rhythm and offers no contrast. The antique staircase in the Vander Kelen House (Figure 208) has a typical rhythm, but no measures are taken to overcome the lack of contrast. In the Pavilion of Knowledge the accessibility employee tries to stick white lines to the stairs to improve the contrast (Figure 209). Tiago confided that he tries to avoid stairs and ramps, his ideal building has one level.

Figure 208 Antique Staircase

Figure 209 White Lines

The elevator was already mentioned under 'Touch' with regard to the tactile and visual experience of its buttons. The size of the elevator is important too for the visitors. The elevator of the Pavilion of Knowledge is rather small (Figure 210), Sofia mentioned this kind of elevator is too small for persons using a motorized wheelchair. By contrast, the two elevators of Museum M are extremely spacious (Figure 211). The reason for this spaciousness is the interior transport of the works of art, but the visitors take advantage of this size.

Figure 210 Elevator Pavilion of Knowledge

Figure 211 Elevator Museum M

The entrance always gives the visitor a first impression of architectural quality and accessibility to the visitor. Obviously the ramp and staircase of Museum M and the entrance ramp of the Pavilion of Knowledge architecturally emphasize the act of entering. Both architects wanted all visitors to enter by the same entrance. In Museum M Stéphane Beel especially focused on persons with a physical impairment. Nevertheless, Charlotte did not consider the ramp as useful. Filip discovered the entrance is not conceived for persons with a visual impairment. The ramp of the Pavilion of Knowledge is not accessible for persons with a manual wheelchair or visitors with a pram. Especially during the outage of the exterior elevator, the idea of entering together does not seem to work. We have to mention, though, that it would be totally different when the gradient of the ramp were not that steep. We have to face the constant relationship between the architectural quality, the objectives of the architect and the potential use of the object.

The entrance has a strong influence on the whole experience of a place (Malik 2006). This fact was experienced in the case studies of the Lotus Temple and the Crafts Museum, but it was also experienced by the user/experts consulted in our two case studies. In the Pavilion of Knowledge Sofia brought up the fact she does not feel comfortable inside a building if she knows she will need help to leave the building. In the Pavilion of Knowledge she could not enter by the ramp, but she knew the exit is accessible. This helped her to feel comfortable inside the museum. Sofia found it strange that the ticket office is adapted to persons in wheelchair, but the ramp itself is not. Maybe the adaptation of the ticket office has more to do with the pro-children policy than with the accessibility of the Pavilion. Another fact Sofia mentioned is the connection between the content of the exhibition and the access to it. The ramp of the space 'Amazona' was too steep and hard to handle, but she did not bother about it because the exhibition itself was interesting[44]. It is odd that both architects paid a lot

[44] See 'Amazona', p.42

of attention to the entrance and its accessibility, but in each of the museums the entrance is the characteristic which is criticised most by the user/experts.

Next to the experience of the entrance, there are other aspects of the building which have a major influence on the overall experience. The stairs and ramps, *i.e.* the differences in level, make a major part of this experience because they often are perceived as obstacles. In the auditorium of the Pavilion of Knowledge, Tiago was struck by the following: to enter the auditorium you have to take the stairs or the ramp upstairs, to find a seat you have to go down again. In the opinion of Tiago this movement was not logical. Sofia also noted this kind of experience. She found it strange a person can enter the auditorium by the ramp, but there is no ramp (only stairs) to reach the stage. Another potential barrier are the doors. In Museum M both user/experts preferred automatic doors. In the Pavilion of Knowledge Sofia mentioned the advantages of sliding doors instead of the revolving door at the bathroom.

A building can also provide a feeling of emptiness as in the Van Dale College (Heylighen *et al.* 2010b) or in the Craft Museum (Malik 2006). Filip mentioned that he experienced Museum M as empty (Figure 212), he guessed the museum is too large for its collection. The activities in the Pavilion of Knowledge are widespread[45], but Tiago did not make a remark about 'emptiness'. Unlike Filip, Tiago was guided by us, so maybe it is another kind of experience. Sofia did mention that the activities are placed at excellent distance from each other for her (Figure 213). Persons with a visual impairment usually do not feel at ease to move through this 'emptiness' (Renders & Viaene 2006). Tiago mentioned that he liked to follow the wall or a banister, for example to go up the ramp and to find the ticket office. The experiences of the banisters of the museums have already been mentioned under 'Touch' and 'Position'.

Figure 212 Emptiness of Museum M

Figure 213 Largeness of Pavilion of Knowledge

'Motion' obviously is closely related to 'Position', although 'Motion' rather focuses on the movement through the space and 'Position' on the standstill inside a space. To move between levels, one can make use of stairs, ramps or elevators. For physically impaired persons, especially for wheelchair users, every step is a potential barrier. Evidently, these persons prefer a ramp or an elevator. Also visually impaired persons usually opt for a ramp or an elevator, as it is more easy to handle. While moving

[45] See 'Explora', p.41

through a space, the visitor can experience a certain feeling. Sometimes a space is experienced as empty. Physically impaired users appreciate the 'emptiness', but visually impaired persons often feel not at ease in these spaces. They usually prefer a kind of guidepath to move through the space.

Final Considerations

By considering the case studies from the literature and the two case studies of Chapter 3, it entirely becomes clear that the experience of architecture is a multi-sensory one. We have tried to classify each example under a certain category. By repeating examples and referring to other senses, we notice all the senses are closely related. As Ingold (2008) already stated, the senses cannot be considered separately. However, it was interesting to notice which sense pays attention to which kind of experience. In this context, we also have to point to the excessive control of one of the senses. In Museum M the temperature was kept constant through the whole exhibition. Through this management, gaining information from the sense of thermal comfort (*e.g.* about the size of a space) was almost excluded. Sometimes the museum management prohibits to touch the exhibited objects, in this way the sense of 'Touch' becomes excluded as well.

At the end of every sense, a little conclusion is given. Every sense is useful to pick up a certain kind of information. Moreover, every sense may be related to the aesthetics as well. Usually, we consider aesthetics as a visual characteristic of a building. Of course aesthetics can be approached in a visual way, but there seem to be more possible approaches of aesthetics. A visual approach appreciates the materials, the colours and the global forms. By contrast, an auditive approach pays attention to the comfortable succession of sounds. Furthermore, a tactile approach of aesthetics focuses on the enjoyable finishing of the materials. A thermal approach concentrates on the succession of thermal qualities. These characteristics can help to get an idea of a certain space and play a role in our appreciation of it. In the field of 'Smell', a visitor appreciates an interesting succession of neutral or pleasant smells. 'Motion' and 'Position' are closely related. Aesthetics of 'Position' may be especially directed to ideal eye height to perceive the whole space. The last sense, 'Motion' is considered as aesthetical when the person feels comfortable to move through a space.

In all approaches, excessive features are not appreciated. Too much sunlight and reflections are considered as negative visual qualities. Too much reverberation or even too many sounds are not thought as pleasant auditive characteristics. For tactile experiences smooth finishings are appreciated most. Persons usually consider neutral smells as positive. Pleasant smells can be interesting as well, as long as there is no multitude of excessive strong smells. Heat and wind are enjoyable thermal qualities, except for muggy temperatures and squalls. For both 'Position' and 'Motion', having no limitations are best appreciated found in the case studies considered.

For a concluding reflection about these case studies, we refer to Chapter 5.

Chapter 5: Conclusion

After having compared the insights gained in the two case studies and confronted them with insights from the literature, this chapter finally is the last one of the thesis 'Another Perspective on the Built Environment'. Here, the research harks back to the original formulation of the problem and the objectives. The conclusions of the previous chapters are gathered and interpreted in the light of these objectives. In the end, we will provide ideas for practical application and some possibilities for further research.

We have started this thesis with a brief outline of the relationship between architecture and the human body, in the past and in present. From ancient times onwards, people have been trying to derive proportions and dimensions from a standardized body. These mathematical principles were translated to architecture, sometimes even literally as Figure 1 and 2 suggest. From this short introduction, the formulation of the problem and the objectives of this thesis were derived. The research question was defined as following: How do people with an impairment experience architecture? And how does this experience relate to the experience intended by the designer?

Under Chapter 2 we have explored some case studies found in the literature, under Chapter 3 we analysed two buildings ourselves starting from the intentions of each architect and by means of the observations of visits with persons with an impairment. Through the case studies from the literature we were provided with some information about the experiences of persons with an impairment. Especially by conducting visits to the buildings in the company of persons with a physical or visual impairment, we became even more familiar with their experiences. In this thesis we have analysed buildings in a way less common in architecture. We further compared the view of the architect to the view of the user/experts.

In the Pavilion of Knowledge, the experience of the user/experts and the personnel did not always resonate with the concept intended by the architect. By creating Expo '98 the city wanted to stimulate the integration with the surrounding areas (Sat 1998). This seemed to work because the park and its transport possibilities are

appreciated by the visitors of the museum. The architect wanted to realize a moment of silence before starting the visit (Fernandes & Cannata 2001). Tiago experienced the approach to the Pavilion as pleasant, *i.e.* walking next to the dock and hearing the fountain. Yet, he had problems to locate the ramp. Sofia experienced troubles as well to find the entrance. So, instead of a moment of silence, rather a moment of chaos is experienced by the user/experts. Furthermore, in the opinion of the architect, the ramp creates movement and tension (Perrault 2000). The movement was only experienced by Tiago because Sofia was not able to go up the ramp. Before the start of the exhibition, there is a space to distribute the visitors, *i.e.* the Foyer (Fonseca 2008). This space was appreciated by both user/experts. The distribution function was clear for both of them and the presence of daylight and view was a surplus value for them. The exhibition spaces are conceived as white sheets (Fernandes & Cannata 2001). However, they are not experienced as such. The user/experts are strongly influenced by the museum content in their experiences of the building. The spaces obviously differ mutually (*e.g.* form, height, temperature,...), so they are not as white as the architect intended to. The central space of the building is the Nave (Perrault 2000). This is well interpreted by the user/experts because of the height of the space, the daylight and the connection to the other exhibition spaces. None of the spaces has natural lighting (Perrault 2000). The impaired persons did not make comments on the lighting, so they did not seem to bother about the absence. By contrast, when daylight was presented (*e.g.* in the Foyer), it was noticed and appreciated by the consulted visitors.

In Museum M the experiences of the visitors seem more in line with the intentions of the architect. First of all, Museum M is considered as a chamber in the city (De Rynck 2009). The user/experts did not talk about a real room, but its characteristics were confirmed. As a room needs to be very accessible by circulation routes, the transport possibilities to reach M were highly appreciated. A room usually has windows, its views were valued by the visitors. The user/experts noticed that the site is a conscious composition of old and new volumes, just as the *Werkplaats voor Architectuur* (2003) already mentioned. They especially appreciated the variation inside the building. The volumes are joined up together so well, that this configuration seemed to be the only possible solution. Each of the three entrances has a typical atmosphere (Beel 2009). The impaired visitors found the entrances very clear, especially the main entrance because of its symbolism. In the beginning the architect was very critical of the portico (Stad Leuven 2009e), but treating it as the entrance seemed to be a stroke of genius. Walking underneath the fronton brings the visitor to the actual entrance with stairs and a ramp. The architect intended to create a very accessible entrance where all the visitors can enter together. Filip and Charlotte liked the concept, except for its realisation. The Antichambre is designed as an impressive transition zone (De Rynck 2009) before entering the exhibitions spaces. This Antichambre was appreciated by both user/experts and they grasped the necessity of it. The exhibition spaces are considered as three different levels, each level with an own concept (Beel 2009). During the visits, the persons especially appreciated the variation between the different spaces. They valued the fluent succession of atmospheres, including the small bridges. They did not explicitly mention the alliance of each level. About the central space of the site, De Rynck

(2009) said that the garden is the municipal chamber. As the impaired persons always looked outside and tried to catch a glimpse of the garden and its tree, this statement seemed to be true. A special feature of the building is the daylight admission. Beel (2009) mentioned that the visitor is guided by the spots of light. Unconsciously, the visitors always seemed to be appealed to the windows.

Through the experiences of the user/experts we abandoned the prevailing relationship between architecture and the body. Instead of reducing the human body to a source of an abstracted system of proportions, we acknowledged the full sensory role of the body in experiencing the built environment. The qualities and obstacles which the user/experts have detected, are not only experienced by persons with a physical or a visually impairment. Excellent public transportation is not only esteemed by persons who are unable to drive a car because of physical issues. Persons who are not interested in driving a car or who prefer using public transport for ecological or financial reasons, take advantage of it as well. Tourists or foreigners appreciate clear signage to the museum, a clear entrance (*e.g.* international symbolism of fronton) and good signage inside the museum itself. Parents with a baby pram also want an accessible entrance. In the Pavilion of Knowledge, it may happen that they have to search for the entrance which is accessibly for the pram. In Museum M they probably have to take a good look before entering the ramp. When visiting a museum with a group of friends on a rainy day, a place to gather inside the museum (*e.g.* the Foyer or the Antichambre) is appreciated. Children often like to take a look outside or to look down. For them, some windows of Museum M may be too high and the translucent banister of the Pavilion of Knowledge can be too high as well. These are just a few examples of qualities and obstacles which are experienced by the user/experts, but of course there are many more issues which are important for a wide range op visitors.

Architectural solutions which enrich the experiences of all visitors, fit in with the concept of Inclusive Design, Universal Design or Design for All. Ron Mace (1991) defines Universal Design as follows: *"designing all products, buildings and exterior spaces to be usable by all people to the greatest extent possible"*. The accessibility employee of the Pavilion of Knowledge mentioned that she wants to establish adaptations to the building which are not meant for persons with an impairment only. She wants to create a museum for everyone. Tiago did not like the signage of the elevator: a numerical value and a symbol in Braille next to each other. He proposed something else: showing one large number and in relief. In Tiago's opinion this solution would serve more visitors. While the accessibility employee and Tiago suggested that architectural answers who serve all the visitors, other user/experts presented partial solutions, tailored to their specific needs. In the Pavilion of Knowledge, Sofia had troubles with the carpet in the entrance volume. She suggested dividing the floor into two parts: one side covered with carpet, one side with flat finishing. In Museum M, Charlotte noticed the carpets in some exhibition spaces. She did not bother about it because she was able to move next to the carpet. On the other hand, she was wondering about the surplus value of this carpet. In the Antichambre, she did not appreciate the height of the ticket office. Charlotte suggested that a part of the desk can be cut out at her height. In the Pavilion of

Knowledge this solution has already been applied. Judging from our case studies, persons with an impairment themselves seem to suggest partial solutions, while the purpose of Universal Design is to serve the greatest extent of people as possible. We have to say that many user/experts may appreciate the concept of Universal Design. As they are no designers themselves, they probably are not able to conceive inclusive solutions.

Unfortunately, many architects still seem to have troubles to integrate accessibility measures with the architectural concept in an elegant way. In this context, Malik (2006) mentioned: "*Most buildings are first designed and then these 'special requirements' are merely pasted on*". Not only architects propose outstanding solutions, also the solutions proposed by the consulted user/experts contained striking suggestions. By contrast, in Museum M we noticed architectural solutions for typical problems concerning accessibility which are really apparent. One of the most striking examples of the Universal Design, is the entrance. Stéphane Beel wanted to let all the visitors together instead of providing a separate entrance for wheelchair users. The user/experts really appreciated the intention, but only regretted its execution. The designers obviously considered the idea of Universal Design as the basic principle, but they succeeded to create an architectural quality by spatially translating this idea. On the roof terrace, the architects first wanted to create a ramp. Because the ramp would become extremely long, they opted for an intermediate solution. It is a staircase but with long stairs, to approach the idea of a ramp. Again, the execution is not as it should be, but they did not want to establish an ordinary staircase. The entrance could serve as an example to make architects more aware of Universal Design. It should not be seen as a limitation, but rather as a challenge. If an architect is able to elegantly integrate the experiences of persons with an impairment into the concept, the solution may benefit architectural quality.

Architects need to realize as well that there is a distinction between accessibility and experience of a building. What has really struck us from the case studies, is the statement of Filip: "*Experience of a building is much more than just accessibility*". All the user/experts made critical comments on the buildings. Despite these remarks, all consulted persons mentioned that the respective museum is one of the best they have ever visited. Filip said that the experience of a building is strongly related to the architecture, the concept, the ideas... Sofia added the experience of a museum is also connected to the content of the exhibition. When architects are able to integrate the requirements of accessibility in the architecture, the experience will only become more interesting. To become aware of the experience of a building, it is very useful to consult persons with impairments. Stéphane Beel mentioned in one of his interviews that he always tries to imagine he is somebody else, *e.g.* a cleaning lady. Filip and Charlotte mentioned that persons without an impairment do not know how they experience the built environment. All the user/experts were really enthusiastic about their participation in the case studies because they appreciate that architects pay attention to them and their experiences.

A final aspect on which we want to shed light, is the possible further research. Through this research we have discovered there is a lot of literature about the experiences of visually impaired persons. By contrast, the accessibility regulation especially focuses on the needs for physically impaired persons. As persons with a(n) (physical) impairment usually are directly associated with accessibility regulation, we think this could be an interesting perspective as well. Both architects pretended they have done more than the accessibility regulation demand. However, the user/experts noticed a lot of obstacles of the buildings. Architects usually apply the requirements through one's hat. As we have experienced in these case studies, one can only learn what these rules imply if one pays attention to the experiences of the focus group oneself.

Appendices

Appendix A: Pavilion of Knowledge

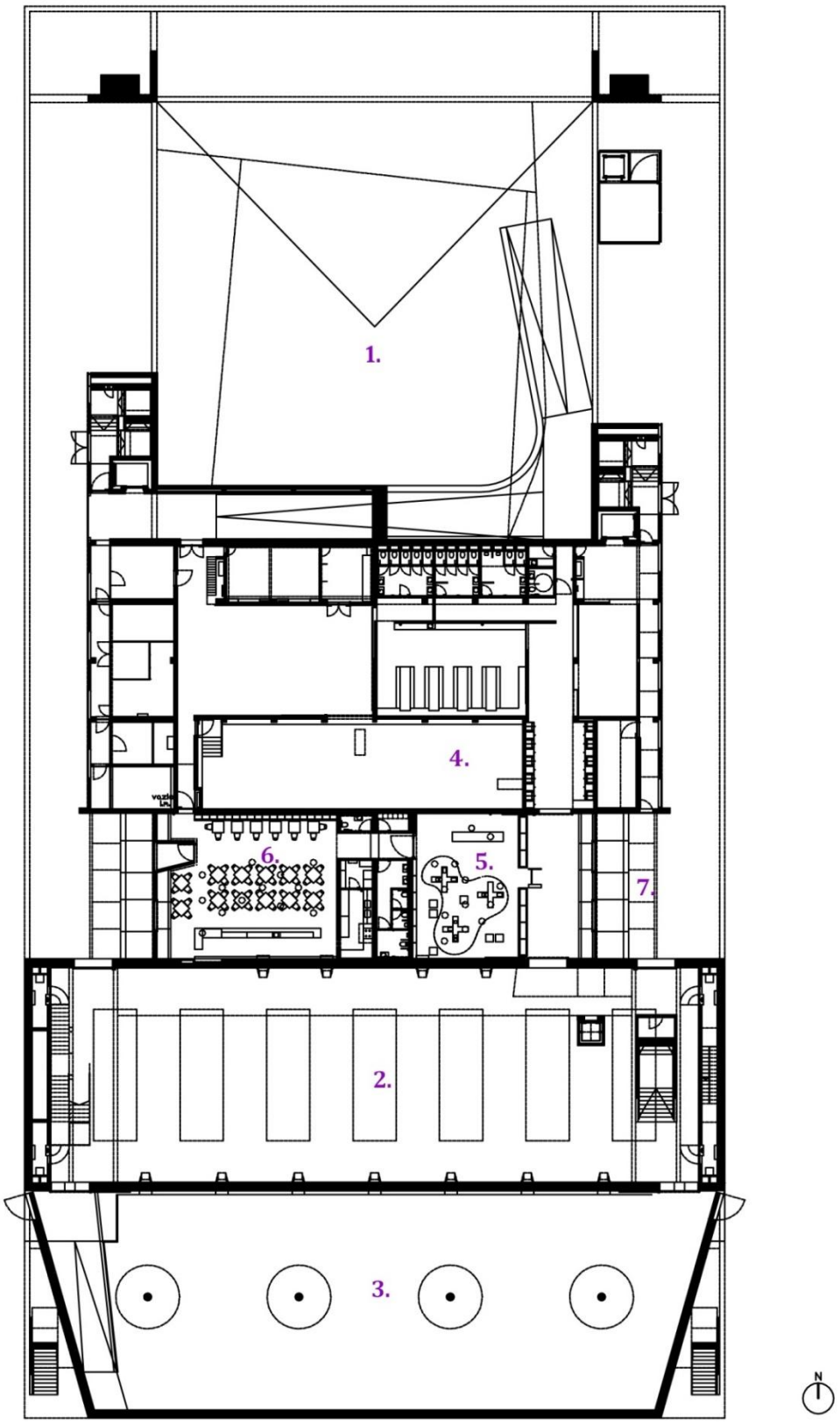

Figure 214 Ground Floor (1/500)

1. Arrival 2. Nave 3. Amazona 4. Group Area 5. Bookshop 6. Café 7. Exit

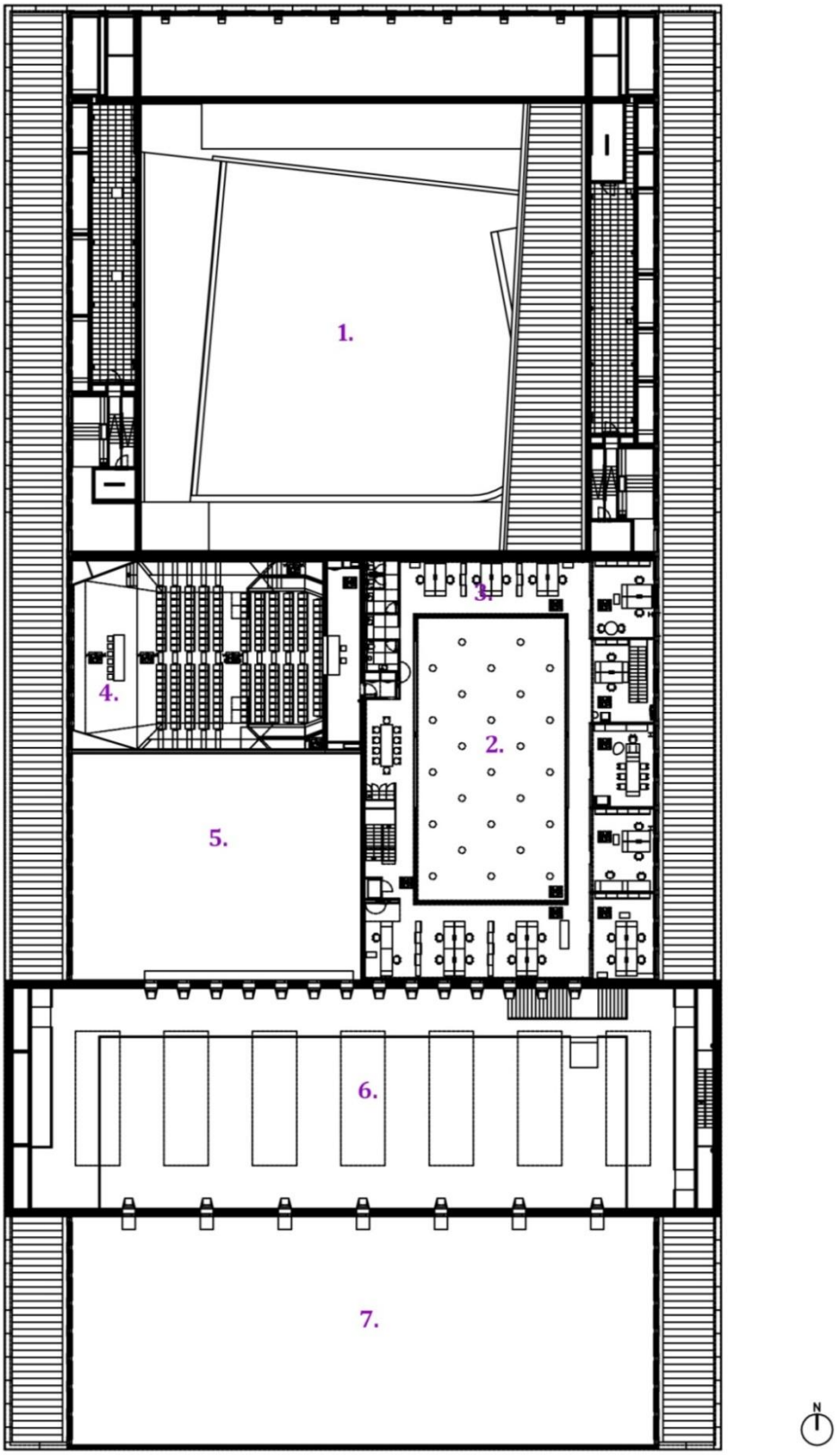

Figure 215 Second Floor (1/500)

1. Arrival 2. Foyer 3. Office 4. Auditorium 5. Explora 6. Nave 7. Casa Inacabada

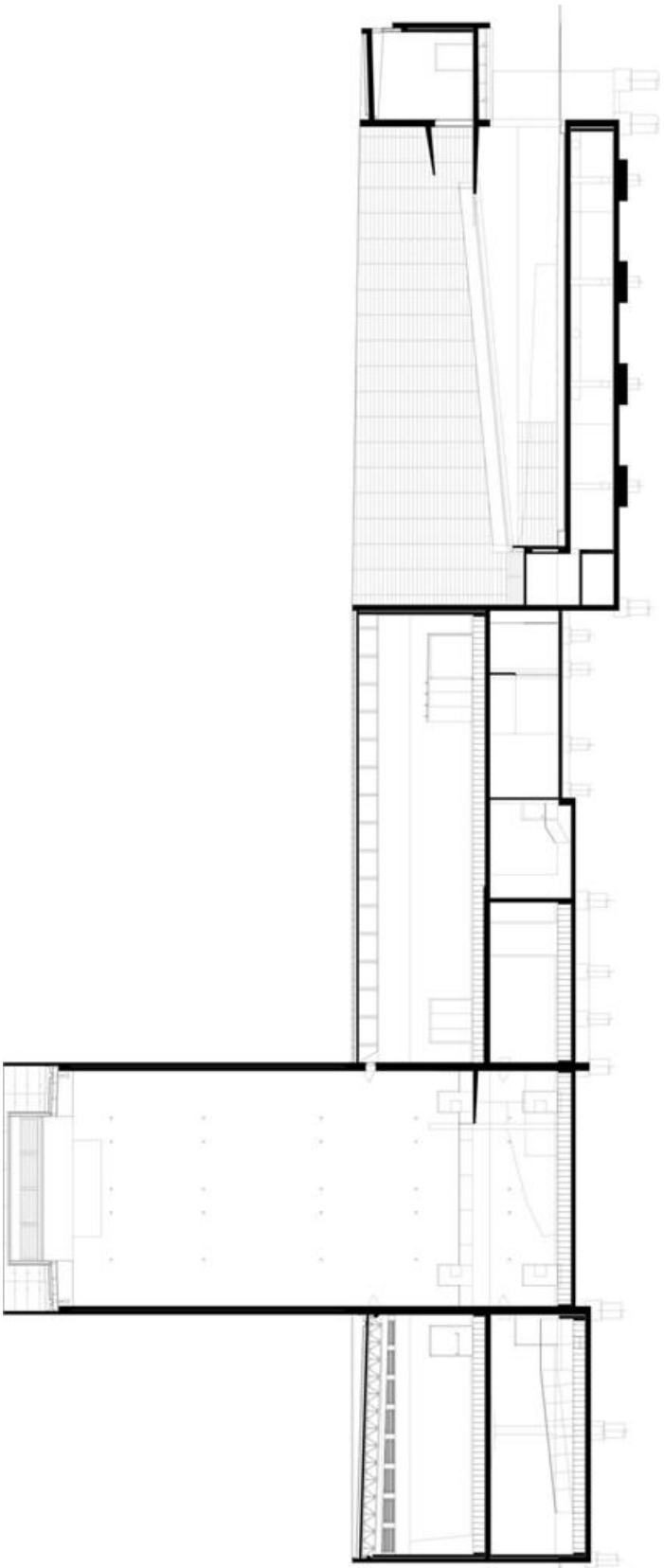

Figure 216 Longitudinal Section Expo '98 (1/500)

Appendix B: Museum M

Figure 217 Floor -0,5

A. Antichambre B. Ticket Office C. Previous Ticket Office D. Bookshop E. Café F. Children's Workshop G. Delivery Zone H. Library I. Office J. Patio

Figure 218 First Floor

13. Space 13: Louvain Faces II 14. Space 14 15. Space 15: Verhaghen's Training
16. Space 16: The Young Verhaghen 17. Space 17: The Empress' Painter
18. Space 18: Mayor Works 19. Space 19 20. Space 20 21. Space 21
22. Space 22 23. Space 23 24. Space 24 25. Space 25 26. Space 26

A. Office

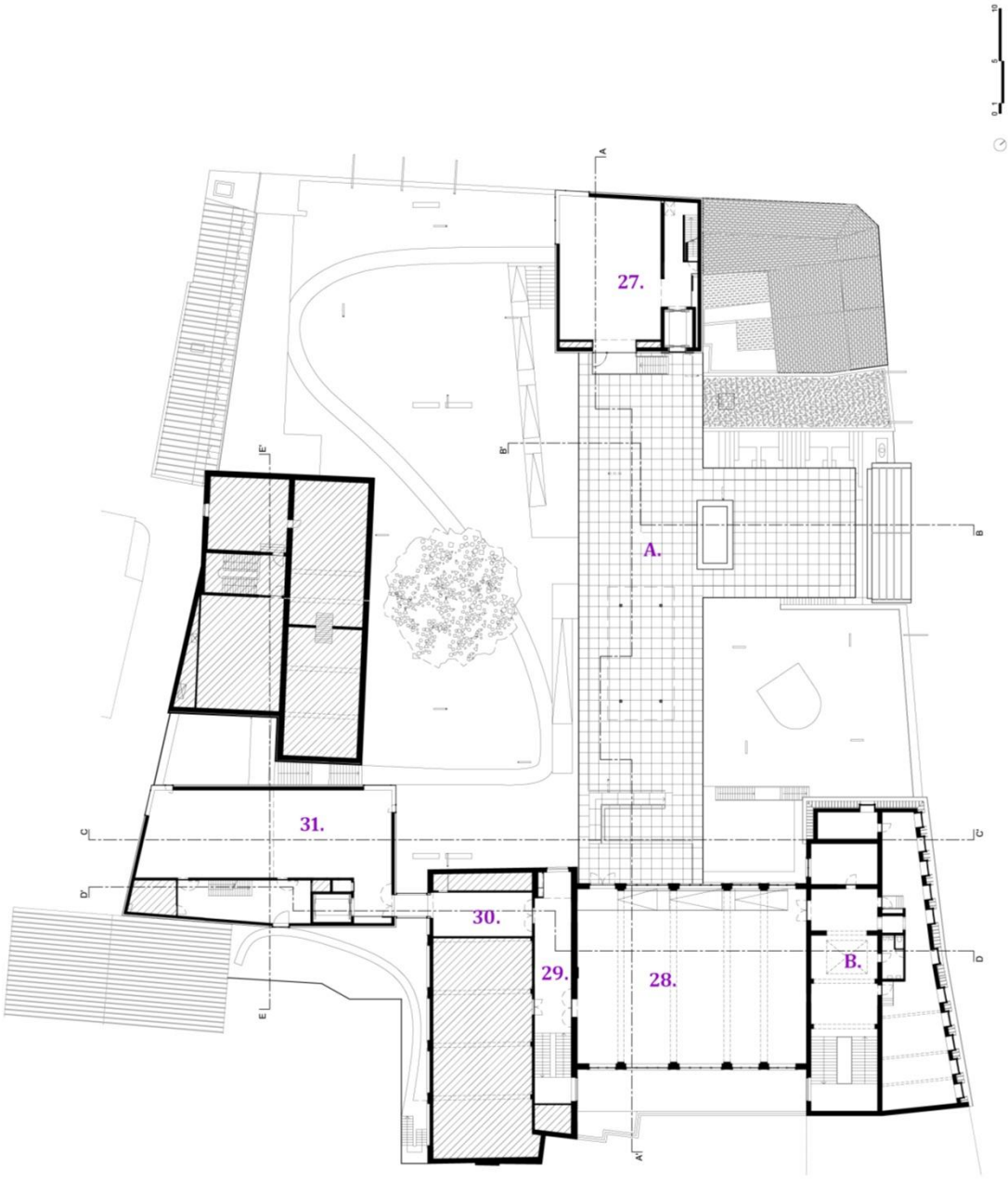

Figure 219 Second Floor

27. Space 27: Mirador 28. Space 28 29. Space 29 30. Space 30
31. Space 31: Workshop

A. Roof Terrace B. Office

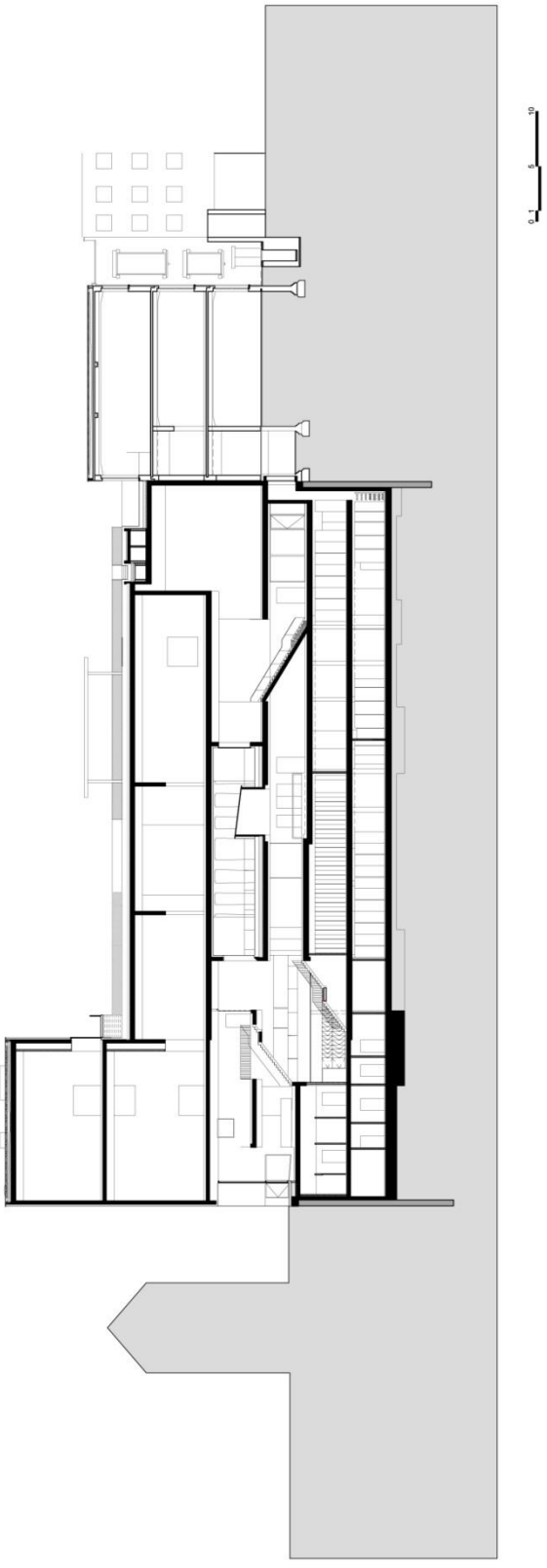

Figure 220 Section AA'

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Personal Conversations

Interviews and visits with the accessibility employee of the Pavilion of Knowledge, Fátima Alves
(06/10/2010, 16/10/2010, 17/11/2010, 10/01/2011)

Interview with the architect of the Pavilion of Knowledge, João Luís Carrilho da Graça
(12/11/2010)

Visit to the Pavilion of Knowledge in the company of a visually impaired user/expert
(25/11/2010)

Visit to the Pavilion of Knowledge in the company of a physically impaired user/expert
(10/12/2010)

Interview with an architect of Museum M (office Stéphane Beel), Bert Bultereys
(31/03/2011)

Mail from office responsible for the climatization of Museum M, RCR studiebureau
(04/04/2011)

Interview with an architecture guide of Museum M, Jeannine Vandessel
(05/04/2011)

Visit to Museum M in the company of a visually impaired user/expert
(07/04/2011)

Visit to Museum M in the company of a physically impaired user/expert
(08/04/2011)