




RIVERBANKS REDEVELOPMENT THROUGH SUSTAINABLE LANDSCAPE PRINCIPLES

A proposal for the banks of the Havel river in Berlin, Germany



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Master Thesis in the Programme
Design for Sustainable Development

Department of Architecture
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Gothenburg, Sweden, 2014

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A 30 credits Master Thesis in the Programme
Design for Sustainable Development

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In today's heavily urbanized environment green areas have an important role to enhance the quality of life. They provide valuable ecosystem services for human wellbeing, as for example opportunities for physical activity, social interaction and mental restoration. Unfortunately, most of the green spaces in the urban settings are not able to satisfy basic human needs due to their poor ecological health.

Therefore, this MT is addressing the challenges of contemporary landscape architecture to restore urban nature and increase human wellbeing. For that purpose several methods and approaches are theoretically reviewed and analytical framework is designed to show how the urban landscape is developed from a sustainable perspective. As a result, principles for sustainable landscape architecture are outlined and implemented in a project for the banks of the Havel river in Berlin, Germany.

The project illustrates how to consider sustainable development in the whole design process: from analysis, through defining a sustainable vision and strategy, to their implementation in a design proposal in two scales. In the first scale, a master plan for the riverbanks redevelopment as sequence of valuable public green places by the water is developed. Secondly, the design of one component of the green sequence is further elaborated to feature a sustainable riverbank. Parking lot transformation into a green place for play and recreation, "walk your senses" path and gardens with diverse vegetation are suggested to increase residents' wellbeing and attract visitors. In the end, sections, renders and colorful planting schemes demonstrate a proposal for socially and ecologically sustainable landscape architecture.

Key words: *urbanized environment, ecosystem services, human well-being, urban landscape, sustainable landscape, sustainable riverbanks redevelopment*

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PREFACE

Fig. 1
Me in the autumn of 2014 in Mauerpark, Berlin



After my graduation in Landscape Architecture, I felt like there is something missing in my knowledge and that was the aspect of sustainability. In my opinion, landscape architecture is a field that should deal with sustainability in every phase of a project: from analysis to site design and construction.

After one year of studies in the Master Programme "Design for sustainable development" I learned a lot about the meaning and purpose of sustainable development in urban planning and architecture, in transformation and conservation. In the final product of my studies- the Master's thesis I want apply this knowledge in the field of landscape architecture, where I want grow professionally. Therefore, by expanding the knowledge I obtained during the years of Master's study, in my MT I am exploring step by step how to implement sustainability in landscape planning and architecture. More precisely, I am focusing my findings on a project for sustainable riverbanks redevelopment to demonstrate a process for making a sustainable landscape project starting with analysis and ending with a design elaborated in different scales.

The idea for making this project came from a competition announced by the Architects and Engineers Association in Berlin: 'Architekten - und Ingenieuren Verein zu Berlin', while I was in Germany for Erasmus studies in the autumn term of 2013/2014. I found the competition task very challenging and interesting. I also liked the project area, which is very diverse and has a lot of potential for development.

However, it was surprising for me that sustainability was not included in the competition task. As my future aim as landscape architect is to incorporate sustainability in every project I am working on, reading the competition brief, I felt that I have a mission- to develop another approach for solving the competition tasks and to create attractive and sustainable landscape project.

Purpose

In today's urbanized environment the sustainable landscapes are of growing significance. The European Landscape Convention, which has now been followed by European governments, considers the role of the landscape in sustainable development as well as its significance for increasing human wellbeing. However, the idea of a sustainable landscape seems to be undefined. Initiated by the Schinkel competition 2014 the MT explores what a sustainable landscape might mean and presents a project for riverbanks redevelopment.

The purpose is to demonstrate a process for creating a sustainable landscape from analysis to design in different scales. On the way for achieving as a final result attractive sustainable project the MT is searching for principles for landscape planning and designs in different theories and approaches to sustainability. Thus, it also educates for sustainability and promotes sustainable design as means for increasing ecological health and human wellbeing.

Research questions

The Master thesis is built upon several main research questions aiming at identifying and describing the qualities of the sustainable landscape and how to plan and design for them.

What does sustainable landscape mean? is the focus of the study. The definition is explored in relation to different theories and in relation to the case for riverbanks redevelopment.

The Master thesis looks further into the questions: *How to create a sustainable landscape? How to analyze and understand the issues of the urban landscape?; Which are the principle for sustainable landscape planning and design?* and *How to redevelop the riverbanks?*

The outcomes of the research is interpreted in a design proposal for a case explained in the following paragraph.

The Case

The project's case is "Sustainable landscape redevelopment of the banks of the Havel river in Berlin, Germany".

The initiative for it came from the Schinkel competition for year 2014 (159. AIV-SCHINKEL-WETTBEWERB 2014: SPANDAU) organized by Architects and Engineers Association in Berlin. The competition is multidisciplinary. There are different tasks and project limitations for architects, landscape architects, urban planners and engineers. I have kept the project limitations defined for landscape architects and followed the main competition tasks (see *Appendix A. Competition brief excerpt, p. 100-102*) while I have been adding sustainable objectives and creating a sustainable vision for the riverbanks.

I also used some of the materials provided as references for analysis and I did several site visits. As a result I mapped my findings in a background analysis of the green structure, built structure and infrastructure in local, regional and city context, which provide a broad picture of the existing conditions (see *Appendix B. Analysis, p. 103-114*).

WHAT?

Sustainable landscape project for riverbanks redevelopment

WHY?

To demonstrate a process for making a sustainable landscape project from analysis to design in different scales.

To outline principles for sustainable landscape architecture and planning.

To inspire the reader for sustainable development.

WHERE?

Havel riverbanks in Spandau, Berlin

Fig. 2
Competition poster
SCHINKEL-WETTBEWERB 2014
Source: <http://www.aiv-berlin.de> [Accessed January 2014]



Location

•The city of Berlin

Berlin is the capital city of Germany. It is Germany's largest city and is the second most populous city with a population of 3.4 million people. Located in northeastern Germany on the River Spree, it is the center of the Berlin- Brandenburg Metropolitan Region (one of the 11 metropolitan regions of Germany, which has about 4½ million residents). Berlin is a world city of culture, politics, media, and science. Its urban setting and historical legacy have made it a popular location for tourists. The city is well known for its festivals, diverse architecture, nightlife, contemporary arts and high quality of living (<http://en.wikipedia.org/wiki/Berlin>).

•Spandau

The project area is located in Spandau, one of the twelve administrative boroughs of Berlin. In spite of being the fourth largest, it is the least populated borough. It is situated at the confluence of the Havel and Spree rivers and along the western bank of Havel (<http://en.wikipedia.org/wiki/Spandau>). (see Fig. 3, 4)

•Old city of Spandau

Originally a separate city Spandau is one of oldest towns on Havel in Brandenburg. The development of the city was over a long period of time, influenced by the needs of the nearby residence and partially restricted by the city of Berlin. Growth and adjustment processes of the Spandau were delayed in time in comparison to other more developed districts of Berlin. The existing urban fabric is a reflection of centuries-old development restrictions. Today, Spandau must mark as one of the cultural centers of Berlin because of its historic town and the Spandau Citadel fortress (Architekten- und Ingenieur-Verein zu Berlin e.V., 2004). (see Fig. 5)

Fig. 3
Berlin and its 12 borough. Spandau is marked with red.

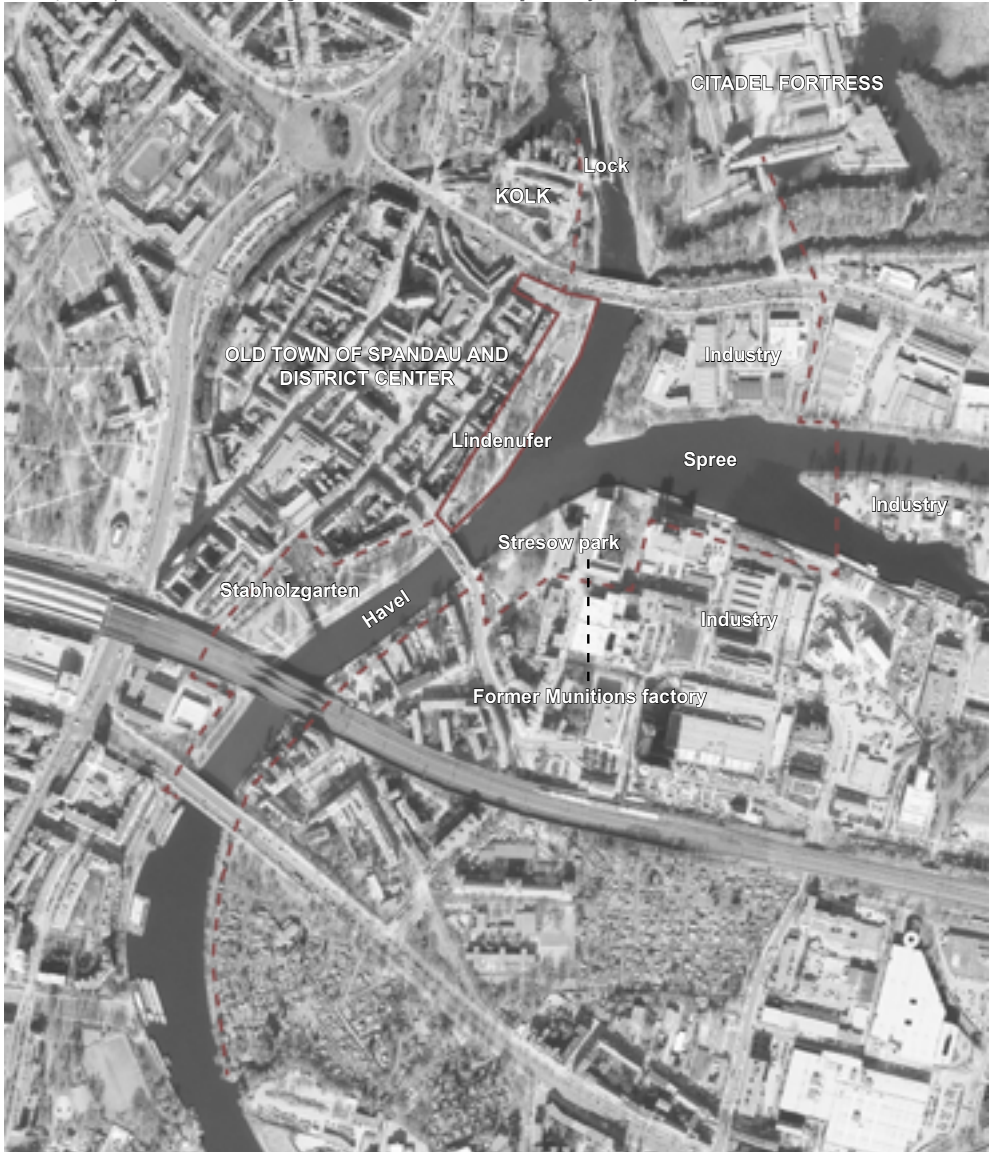


Fig. 4
Map of Spandau. The Project area is marked with red.



Fig. 5 Project area

Source for area photo: Architekten- und Ingenieur-Verein zu Berlin e.V, 2014 [Accessed January 2014]



Project area and redevelopment objectives (see Fig. 5)

The project area is a good example of urban landscape influenced by both urbanization and industrialization. A patchwork of different fragments characterizes the riverbanks (see fig. 7): parks, residential buildings, a historic Munitions factory, undeveloped and developed parts of the river banks, industrial zone (see fig. 8) and last but not least the Old city of Spandau. From an overall urban perspective Spandau should become one of the cultural center of Berlin: a place for art and culture, as well as attractive place of living and working. The new development in the project area must strengthen its identity.

The main redevelopment objectives taken from the competition brief (Architekten- und Ingenieur-Verein zu Berlin e.V., 2004) which are considered in the MT are listed below:

- Appreciation of the water front as an attractive addition of the old city
- Enhanced interaction between the Old city of Spandau and the Citadel fortress which are important for residents and tourist. They should be linked to the waterfront.
- Walkable riverbanks on both sides of the Havel river must be established and connected with the adjacent neighborhoods.

Fig. 6 Citadel



Fig. 7
Havel river banks: Lindenufer, Green area in Industrial zone, Stresow park (from links to right)



Fig. 9
The Lock. Connects the different water level heights of the Lower Havel waterway and the Upper Havel waterway. It is between the Kolk and the Citadel fortress.



Fig. 8
Industrial zone



Scope and structure

This master thesis is 50% research and 50% design. It contains two parts. Theoretical study and analysis are concentrated in the first part of the MT, while design is presented in the second part.

In part one *"From urban reality to a sustainable vision"* the work is divided in two chapters. In the first, *"How to create the sustainable vision?"* theory and principles for sustainable development are studied. As a synthesis of the theory in Landscape ecology, Historic Urban Landscape and concepts of place and space, three main principles are outlined to built analytical framework. Further analyzed in this chapter are the demographic structure, the green structure, the history and the morphology of the project area, as well as the identity of the riverbanks. In the second chapter *"The sustainable vision explained"* SWOT analysis, strategy and implementation guidelines are identified as point of departure for the second part of MT.

Part two *"From sustainable vision to design proposal"* also has two chapters which contain the design work in two different scales. In chapter three the redevelopment strategy is implemented in a master plan for the banks of the river Havel. In the end, in- depth design proposal for Lindenufer riverbank as part of the master plan is presented in chapter four.

Methodology

The table below (see fig.10) shows the process and methods in which the MT is completed. First of all, a theoretical review is executed within three fields: Landscape ecology, Historic Urban Landscape approach and Place and Space concepts. As a result three main principles for sustainable redevelopment are outlined as a synthesis.

Fig. 10 Theoretical research in three fields

LANDSCAPE ECOLOGY	HISTORIC URBAN LANDSCAPE	PLACE AND SPACE CONCEPTS
<ul style="list-style-type: none"> • Effective approach to urban sustainability • The aim is to understand urban ecosystems and to plan for their restoration and preservation • Humans and their activities are considered as part of the landscape 	<ul style="list-style-type: none"> • Historic Urban Landscape Convention (UNESCO, 2012) • Vienna Memorandum on "World Heritage and Contemporary Architecture - Managing the Historic Urban Landscape" (UNESCO, 2005) • Helps planners to integrate new development in historic urban environment 	<p>Approaches for analyzing and understanding places and spaces:</p> <ul style="list-style-type: none"> • the Genius Loci concept • Kevin Lynch's 'The image of the city' • Gordon Cullen's serial visual analysis <p>• A good understanding of the identity of the place helps to characterize the green area in its context and as part of the place/space character.</p>
PRINCIPLES		
1. Design landscape that supports both ecosystem services and human well-being	2. Design landscape that relates to the history	3. Design landscape that strengthens the identity

Analytical frameworks

Three analytical frameworks are design based on the theory to follow the main principles in the design process (see *fig. 11*). They analyze social and ecological factors, how the riverbanks developed over time and the identity of the riverbanks. After conducting the analysis these frameworks are filled in with conclusions and objectives for sustainable development.

Fig. 11 Analytical frameworks

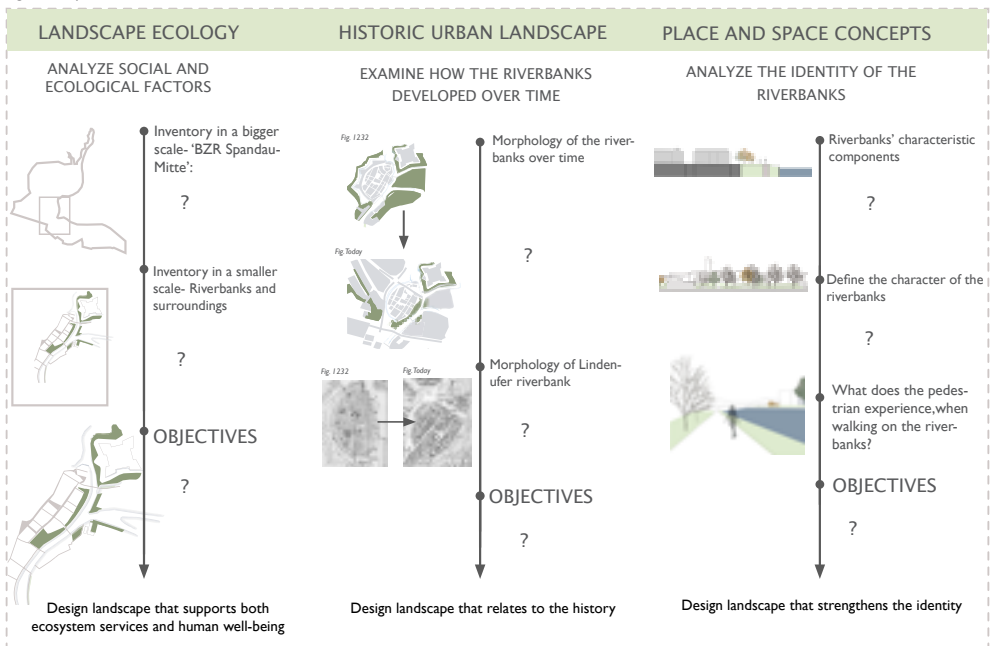
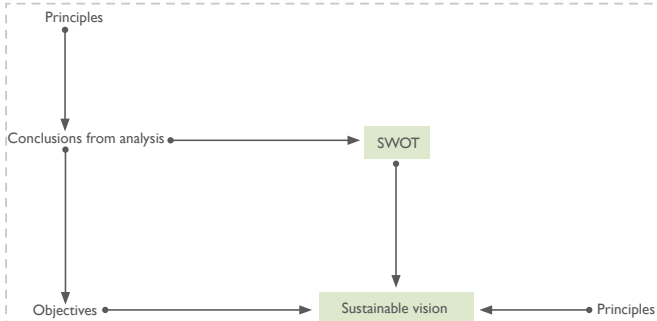


Fig. 12. Process lines for creating a sustainable vision for the riverbanks



Aim of the analytical frameworks

The aim of the analytical frameworks is to take the project from analysis to the next level- SWOT analysis and defining a sustainable vision for the riverbanks (see *fig. 12*).

{**PART I**} FROM URBAN REALITY TO A SUSTAINABLE VISION

{CHAPTER 1} HOW TO CREATE THE SUSTAINABLE VISION?

{CHAPTER 2} THE SUSTAINABLE VISION EXPLAINED

Sustainable development in the case of the landscape

According to the report *Our Common Future* (WCED, 1987) Sustainable development is development that “meets the needs of the present without compromising the ability of future generations to meet their own needs”. What is also important to be said about sustainable development is that it is considered to be at the intersection of four general dimensions: environment, economy, society and politics. In my opinion this applies also for the sustainable landscape and I found conformation of this fact in Salman’s article “What do we mean by sustainable landscape” (2008). The author analyses the environmental, economic, social and environmental aspects of the sustainable landscape and argues that the first three are the main aspects of sustainability, while the last- the political sustainability is engaged mainly with responsible planning, regulations and management. Further, he defines what sustainable landscape in its different dimensions is.

- Environmental sustainability of the landscape

It considers the ecology of the green spaces, the state of ecosystems they are made of and services they provide. The science of Landscape ecology is mainly dealing with environmental sustainability. Attention is paid to ecological factors of the landscapes, as for example soil and water quality, the vegetation and its influence on the microclimate and atmospheric carbon levels. More precisely, the qualities of the services landscapes provide and how to improve them are important for landscape sustainability (Salman, 2008). The ecosystem services of the landscapes are categorized in the Millennium Ecosystem Assessment (2005) as followed:

- Provisioning services such as food, water, timber, and fiber;
- Regulating services that affect climate, floods, disease, wastes, and water quality;
- Promoting cultural services that deliver recreational, aesthetic, and spiritual values; and
- Supporting services such as soil formation, photosynthesis, and nutrient cycling.

- Economic sustainability of the landscape

The economic sustainability of landscapes may be expressed as the maintenance of attractive green areas to support tourism and recreation. Drivers of landscape change such as housing, energy, and infrastructure also play important role for economic sustainability (Salman, 2008).

- Social sustainability of the landscape

Salman (2008) covers only one aspect of the social sustainability: public participation in landscape analysis, planning and design. I would like to add two more aspects: the landscapes observed as places for social interaction and last but not least the landscapes’ relation to human wellbeing (see p. 12, fig. 1.1). Many studies have proved the impact of the green area on mental and physical health. The Millennium Ecosystem Assessment (2005) links the earlier mentioned ecosystem services with the wellbeing benefit they deliver to people (see p. 15, fig. 1.5).

- Political sustainability of the landscape

In short, it requires effective governance structures. A good example is the European Landscape Convention, which has been adopted in many countries.

The European Landscape Convention (ELC)

The ELC gives a very interesting definition of the landscape: "An area as perceived by people, whose character is the result of the action and interaction of natural and/or human factors". This means that it applies to all kind of landscape, for example natural, rural, urban and those who need management, conservation and restoration. The convention is also "concerned to achieve sustainable development based on a balanced and harmonious relationship between social needs, economic activity and the environment".

My understanding of the notion of the convention is that it aims at achieving landscape protection, management by national co-operation and by respecting all aspects of sustainability. The convention encourages joint effort on landscape issues by taking into account culture and nature in order "to protect the quality of life and well-being of Europeans in a sustainable development perspective" (Council of Europe, 2006). Therefore I emphasized my further research on the relationship between landscape and well-being, because I felt it is important for finding more precise and clear definition of the sustainable landscape.

Landscape and well-being

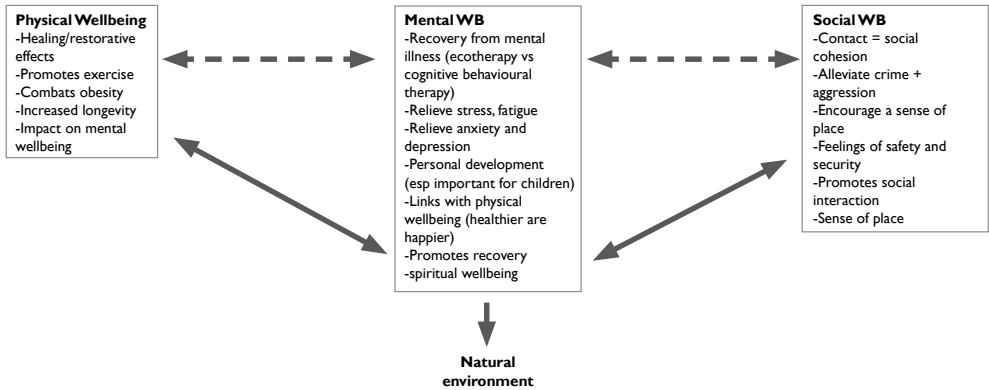
I found out that key aspect of the sustainable landscape is its relation to human well-being.

To begin with, how human well-being is defined in the literature? Landscape ecologist identify the human well-being as the degree of satisfying the basic, psychological, and spiritual needs of humans, which are influenced by landscape structural and functional attributes (Wu, Chunyang He, Ganlin Huang and Deyong Yu, 2013). Which means that landscape have a significant role is human life and consequently for happiness.

In the document "Landscape and sustainable development: challenges of the European Landscape Convention" the link between landscape and human wellbeing is analyzed in details to provide understanding of how human wellbeing is affected by the outdoor environment. The document distinguishes between individual wellbeing, which is divided in physical and mental well-being and social well-being. The physical well-being is closely related to the human senses: hearing and sounds, sense of touch, sense of taste, sense of smell and eyesight, while mental and spiritual wellbeing depends on a person's attachment to the landscape: "the place where he lives, the local culture and the freedom to express it". Other sources add social well-being in the picture by pointing out the positive effects of social integration and inclusion, which public green areas provide for the people (Newton 2007; Grahn and Stigsdotter, 2010).

Newton's research paper "Wellbeing and the Natural Environment: A brief overview of the evidence" (2007) explores the dependence of the different dimensions of human well-being on green areas. The table (fig. 1.1) illustrates findings about the benefits of the green spaces on the different types of human well-being. It also gives an idea what a sustainable landscape is. For example the sustainable landscape have healing, restorative effects on human health, relieve stress and promotes social interaction.

Fig. I.1
Wellbeing benefits of green spaces
Source: Newton, 2007



1.2. Design landscape that supports both ecosystem services and human well-being

1.2.1. Landscape ecology

Fig. 1.2
Source: journalidub.blogspot.se [Accessed February 2014]



Fig. 1.3
Source: journalidub.blogspot.se [Accessed February 2014]



DEFINITIONS

Patch: a term fundamental to landscape ecology, Patch is defined as a relatively homogeneous area that differs from its surroundings. Patches are the basic unit of the landscape that change and fluctuate. This process called patch dynamics. Patches have a definite shape and spatial configuration, and their quality can be described by measurements, as for example number of trees, tree species, height of trees.

Matrix is the “background ecological system” of a landscape with a high degree of connectivity. Connectivity is the measure of how connected or spatially continuous a corridor, network, or matrix is. For example, a forested landscape (matrix) with fewer gaps in forest cover (open patches) will have higher connectivity.

Corridors have important functions as strips of a particular type of landscape differing from adjacent land on both sides.

Mosaic describes the pattern of patches, corridors, and matrix that form a landscape in its entirety (Forman, 1995).

Introduction

By researching how to design the sustainable landscape, I focused on the science of Landscape ecology as a field that deals with the environmental sustainability of landscapes. Its main objective is ecosystems restoration and preservation. I noticed that most recent theoretical reviews in Landscape ecology integrate increasing social concerns, which relate to the main function of the sustainable landscape- to increase human wellbeing. Therefore, it is not surprising to me that Urban landscape ecology exists - a new field that looks at humans and their activities as part of the landscape.

I made a survey in both Landscape ecology and Urban landscape ecology to be able to plan for urban sustainability. I tried to understand how they are applied. In addition I outlined some general principles that best suit my case and could serve as guidelines for analysis and consequently for a design proposal.

Landscapes and Landscape ecology

In the science of Landscape ecology landscapes are defined as “spatially heterogeneous geographical areas characterized by diverse interacting patches or ecosystems, ranging from relatively natural ecosystems such as forests, grasslands, and lakes to human-dominated environments including agricultural and urban settings.” (Wu, J. 2006).

Landscape ecology analyzes the landscapes and its components to understand the ecological state of the environment and the functions of the ecosystems in order to improve them. Its studies emphasize on spatial heterogeneity of the patterns in the landscape, which consists of patches, corridors and matrixes (fig. 1.2, 1.3). Usually the analysis are done within a variety of landscape scales and development spatial patterns. These spatial patterns are related to ecological processes and ecosystem functions, which are important for ecological understanding of the landscape and its management. By analyzing the patches, how they change over time and the interaction between them, objectives for sustainable development of the landscape they construct may be defined (Beck 2013).

Urban landscapes as focus in Landscape ecology

According to the academic journal “Urban Landscape Ecology: Past, Present, and Future. Landscape ecology for sustainable environment and future” (Wu, Chunyang He, Ganlin Huang and Deyong Yu, 2013) Landscape ecology is increasingly interested in urban landscapes as they are suffering under many environmental, social and political problems. The authors conclude that the today's urban landscape is unsustainable. The urbanized land which covers only about 3 % of the earth's surface has ecological footprint that is hundreds of times bigger than its physical sizes. The numbers are terrifying: the cities are responsible for about 78 % of carbon emissions, 60 % of water use and 70 % of the wood used for industry. As a result, urbanization affects biodiversity, ecosystem services and climate on local and global scales. This why landscape ecology should be implemented to make cities more sustainable.

In my opinion this approach is very effective, because it is based on good understanding of the elements of the urban landscape: vegetation, infrastructure, built up areas. In Landscape ecology they are called patches and form the so called urban landscape patterns. Beck (2013) states that the main feature of the urban landscape patterns is their heterogeneity, because of their complex structure. Therefore when dealing with urban landscapes a study of the social and ecological factors is necessary. How these factors interact with each other is also important part of the analysis. This is the key to identify the problems in the urban environment and to design built landscapes with functions that are needed and do not upset ecosystem services. In addition, the changes designers implement should improve their ecology and support human wellbeing.

How to apply urban landscape ecology?

The article “Urban Landscape Ecology: Past, Present, and Future. Landscape ecology for sustainable environment and future” (Wu, Chunyang He, Ganlin Huang and Deyong Yu, 2013) explains very coherently how to apply urban landscape ecology. There are three main steps.

The first is to characterize the patterns, how they were formed, and the driving processes of the urban landscape. This involves mapping urban morphology and landscape patterns over time, identifying social, economical and environmental drivers. It helps planners to understand processes in urban patterns on different scales ranging from the site for development to region and even city scale.

The second step is to conduct “impact studies”. This is an assessment of the ecological and environmental impact of the urbanization. For example, how urbanization affects biodiversity, population and community processes, ecosystem functions, and ecosystem services.

The last step is to understand and improve the urban sustainability. This can be achieved by planning for interactions between urban ecosystem services and human well-being and planning for resilience of the ecosystems in the urban landscape.

In the end the article concludes that in order to apply landscape ecology it is important to integrate the three steps, as shown in fig. 1.4. This approach emphasizes on ecosystem services and their relationship with human well-being to improve urban sustainability.

Fig. 1.4

The scope of urban landscape ecology: three key components and their relationship

Source: Urban Landscape Ecology: Past, Present, and Future; Jianguo Wu, Chunyang He, Ganlin Huang and Deyong Yu: 2008



Principles for analytical framework

The book "Principles of Ecological Landscape Design" is an overview of Landscape ecology and give valuable guidelines for sustainable development in landscape planning and design. From it and other sources I managed to filter out several principles:

- "Understand urban patches, their interaction with each other. Understand how they are connected and how they developed over time" (Wu, Chunyang He, Ganlin Huang and Deyong Yu, 2013).

This principle can be implemented by analyzing the components of the urban environment, such as built up structure, green structure, infrastructure.

- "Understand and work with the heterogeneity of the urban ecosystem. Analyze social and ecological contrasts and how social and ecological factors interact with each other" (Wu, Chunyang He, Ganlin Huang and Deyong Yu, 2013).

This principle may be observed as the next stage of the analysis of the urban components. As most of the development plans are for improving social services and live-standard of the residents of an areas, social and ecological factors should be analyzed. The aim is to predict how planned intervention and new uses will affect the environment and how to mitigate the existing negative influence of human activities.

- "Evaluate the state/qualities of the urban environment and define objectives for sustainable regeneration, restoration, development" (Wu, Chunyang He, Ganlin Huang and Deyong Yu, 2013)

Evaluation of the qualities of the urban environment and defining of the objectives for planning are typical for every planning process, yet defining the sustainable objectives is something different. When planning for sustainability, we should not forget to think about how to improve the ecology of the places.

The following two principles are examples of how to improve the ecology of the landscapes. In my opinion, they should be included in every landscape project:

- "Use plants to create resilient, self-regenerating plant communities, which heal soil, air and water and are economically effective." (Beck, 2013).

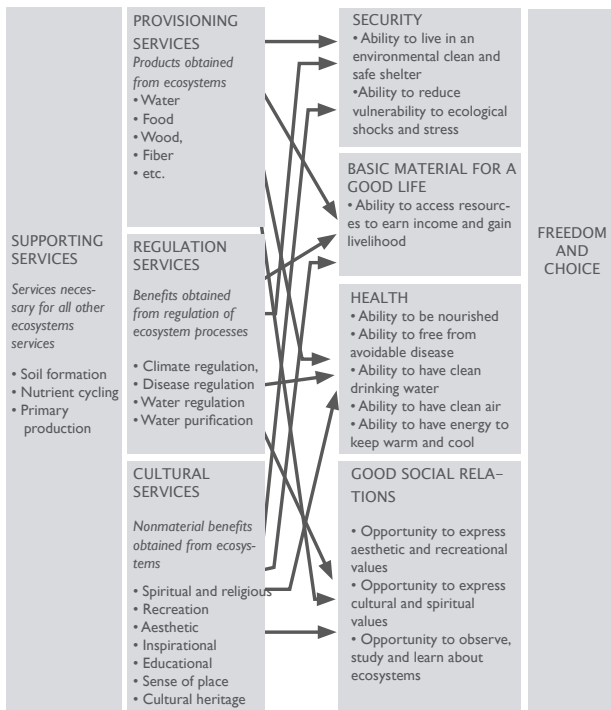
- "Design the edges between different patches to create attractive and resilient urban landscapes", as for example waterfronts (Beck, 2013).

In conclusion, I would like to express my belief that Landscape ecology approach is a good method for achieving ecological and social sustainability of the urban landscape. Although the approach requires a lot of data for ecological factors and its implementation is beyond my expertise, the study of this method provided me with better understanding of what a sustainable landscape is. The principles for sustainable landscape planning and design have being helpful guidelines for analysis and defining sustainable objectives for the riverbanks in Spandau.

Design landscape that supports ecosystem services and human well-being

If I have to sum up what is main aim of landscape ecology in relation for planning for sustainability I would use the principle "Design landscape that supports both ecosystem services and human well-being" (Beck, 2013). This is my opinion the most clear and precise formulation of a principle describing how to create a sustainable landscape. It emphasizes the relationship between landscape and human wellbeing, which is a mainstream in Landscape ecology. Following it is a way to design ecologically and socially sustainable landscape.

Fig. 1.5
Ecosystem services and their relationship with human well-being
Source: Millennium Ecosystem Assessment (2005)



MAIN GUIDELINES

- Understand and work with the heterogeneity of the urban ecosystem
- Analyze social and ecological factors



Inventory in a bigger scale– ‘BZR Spandau–Mitte’

- Demographic structure
- Dwelling stock
- Economy
- Social services
- Public spaces and green infrastructure

Inventory in a smaller scale– Riverbanks and surrounding area

- Land use
- Availability of Public, Near-residential green Spaces
- Biotopes
- Biotope values
- Protected areas by nature conservation legislation and NATURA 2000
- Green areas use analysis
- Vegetation

Objectives for sustainable riverbanks redevelopment

?

DESIGN LANDSCAPE THAT SUPPORTS BOTH
ECOSYSTEM SERVICES AND HUMAN WELL-BEING.

Analyze social and ecological factors

Guided by this principle of landscape ecology, I collected data for the demographic structure of a central part of Spandau. The combination of demographic data, maps and information about dwelling stock, economy and public and green structure, social infrastructure are important to define which services are missing and where to integrate the new function.

In addition some ecological factors are observed mainly related to biotopes structure and function in the green areas to analyze the patches of the green space and their resilience.

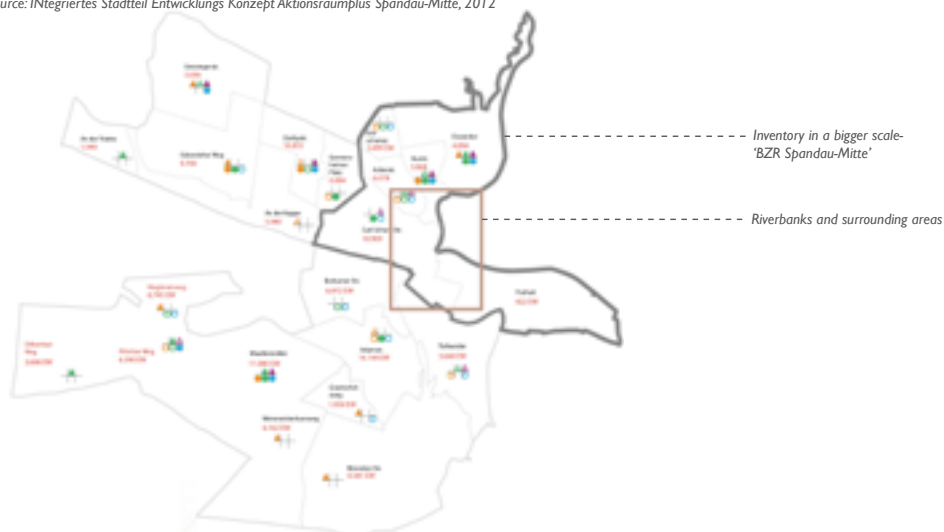
Different scales of analysis

The analysis are conducted in different scales; a bigger scale for defining the needs of the inhabitants living not only in the old city, but also in the surrounding regions which are close enough to use the new planned services on the Havel riverbanks.

The smaller scale analysis focus on some ecological indicators as biotopes analysis, their heterogeneity, defined by the use patterns of the built-up area use and more precisely of open- space use. Analysis of vegetation, biotope values and protected area by natural conservation legislation are also made.

These analysis gives information of what kind of new uses should be planned for green spaces and which ecosystem services should be improved in order to implement the principle: Design landscape that supports both ecosystem services and human well-being.

Fig. I.6
Map of demography and development risks (See appendix p. 104, 105 for analyses of demographic structure)
Source: Integriertes Stadtteil Entwicklungs Konzept Aktionsraumplus Spandau-Mitte, 2012



1.2.2. Analytical framework: Analyze social and ecological factors

Inventory in a bigger scale- 'BZR Spandau-Mitte'



Fig. 1.7
Economic situation
Source: INtegriertes Stadtteil
Entwicklungs Konzept
Aktionsraumplus Spandau-Mitte, 2012

LEGEND

- Borough Center: Old city
- Industry

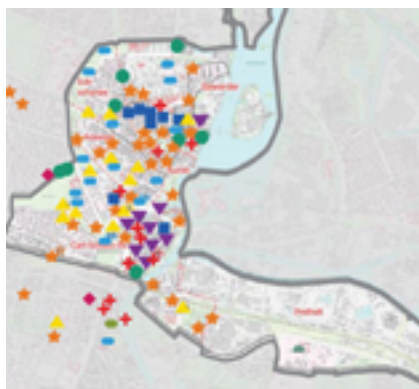


Fig. 1.8
Social infrastructure
Source: INtegriertes Stadtteil
Entwicklungs Konzept
Aktionsraumplus Spandau-Mitte, 2012

LEGEND

- ▲ Schools
- ★ Childcare
- + Health care services
- ◆ Cultural institution
- ◆ Institutions for Children, Youths and families
- Senior citizens' home assistance service
- ◆ Social advice center
- Sports facilities

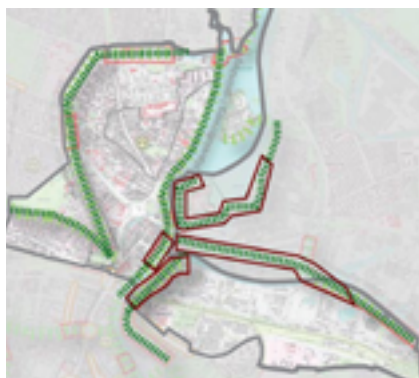


Fig. 1.9
Green infrastructure
Source: INtegriertes Stadtteil
Entwicklungs Konzept
Aktionsraumplus Spandau-Mitte, 2012

LEGEND

- Missing connections of green corridors
- Main green corridors (20 Green ways of Berlin)

ECONOMY

The Center of the Spandau borough embraces the Historic city and extends in north- west direction in the new town. The Historic city supplies the population in whole Spandau with retail, a variety of services and administrative functions. In the new town, there is a shopping street, as extension of the old town services.

The large industrial areas close to the old city have high share of manufacturing (Blacky dress, Hegemann group, Sam & Heinrichs, Wild) and specialty market area (IKEA, Bauhaus, Luna Restaurant GmbH).

In "BZR Spandau Mitte", there are the most work places in the whole "Spandau-Mitte" area.

SOCIAL SERVICES

Main of the cultural and educational institutions: High school, music school and library are centrally located in the old town. There is also a variety of doctor practices and psycho-social consultation services, children's and youth health and dental services. The BZR Spandau has the best supply in childcare services, but miss facilities for youth.

PUBLIC SPACES AND GREEN INFRASTRUCTURE

For the residents in the new town mainly the Wröhmännerpark and the Koeltzpark are of importance for recreation.

Although the old town is very good with public spaces supplied, its expose to the Havel river and the potential of the open green space is not optimally utilized for recreation.

Green spaces in many of the residential areas in BZR Spandau are deficient. (INtegriertes Stadtteil Entwicklungs Konzept Aktionsraumplus Spandau-Mitte, 2012)

1.2.2. Analytical framework: Analyze social and ecological factors

Inventory in a smaller scale- Riverbanks and surroundings



Fig. 1.10
Urban patches
Source: Ecological Atlas of Berlin
http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml
[Accessed February 2014]

URBAN PATCHES ANALYSIS

The map shows the distribution of the urban patches: traffic corridor, industrial areas, housing, green and open space, allotment gardens. The urban matrix is very heterogeneous.



Fig. 1.11
Use patterns
Source: Ecological Atlas of Berlin
http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml
[Accessed February 2014]

USE PATTERNS ANALYSIS

The analysis of the use patterns shows diverse use of the urban structure, especially in the old town of Spandau. The river which is a corridor in the urban matrix could be observed as a divider between the old city on one side of the river and the industrial area on the other, divider between public and private use. On the other hand the riverbanks and the river have the potential to be a connector in future development by integrating green infrastructure services and public use.



Inventory in a bigger scale– ‘BZR Spandau–Mitte’

- **Demographic structure:** Unemployment, Population with immigration background, housing from 1920th 1930s, 1960s- 19080s, 1980s
- **Dwelling stock:** The old city's perimeter block aging from the time of the foundation of the city, housing
- **Economy:** the most work places in the whole Spandau are in this area
- **Social services:** very good supplied with childcare services, but miss services for youth.
- **Public spaces and green infrastructure:** green spaces in many of the residential areas are deficient, the old city is lively public space, but its exposure to the river and the potential of the open green space on the riverbanks is not optimally utilized for recreation.



Inventory in a smaller scale– Riverbanks and surrounding area

- **Land use:** mix-use in the old town, industry, residential area,
- **Biotores:** there is no biotope diversity
- **Biotope values:** there are valuable biotope only on the Citadel ring, the rest of the biotopes along the river have low value
- **Protected areas by nature conservation legislation and NATURA 2000:** The Citadel ring
- **Green areas use analysis:** a lot of unused and inaccessible green spaces along the riverbanks
- **Vegetation:** open-space vegetation consist about 50% of lawns, trees and brushes only about 25% and the rest of field weeds and flower beds.



Define objectives for sustainable riverbanks

- Create valuable biotopes to increase ecosystem functions and to create healthy urban environment.
- Optimize the potential of the riverbanks for recreation and public use.
- Make riverbanks accessible by connecting riverbanks with new paths and bridges.

DESIGN LANDSCAPE THAT SUPPORTS BOTH
ECOSYSTEM SERVICES AND HUMAN WELL-BEING

Introduction to Historic Urban Landscape approach

In the case of the riverbank redevelopment in Spandau it is very important to respect the Old city, the Citadel and the former Munitions factory which are listed as cultural monuments. Urban heritage is a source of social stability, urban creativity, innovation and regeneration (UNESCO, 2011). By following the morphology of the urban area and its use patterns over time, we can understand how its identity changed over the years. UNESCO's approach to managing historic urban landscapes helps to maintain urban identity and protect historic areas.

When planning for sustainable development, one of the most important aspects to consider is how the area or the site developed over the time and if there are places of historical and cultural significance. The role of contemporary architects, landscape architect and urban designers is to respond to the dynamic of the urban environment in terms of changing use pattern over the time and facilitate social and economic development, while respecting the inherited natural and urban environment.

There are many documents which helps planners to integrate new development in historic urban environment, as for example Recommendation on the Historic Urban Landscape (UNESCO, 2012), Vienna Memorandum on "World Heritage and Contemporary Architecture - Managing the Historic Urban Landscape" (UNESCO, 2005); World Heritage paper (UNESCO, 2010). They prove why historical significance should be considered, the aims of HUL approach and some principle that should be implemented in future developments of the urban environment.

UNESCO (2005) states that all historic sites, cities, landscapes require planning and management that consider conservation as main aspect for future development. Urban heritage and future planning must therefore interact with each other. The key for achieving this is to understand the urban environment as "subject to dynamic forces in the economic, social and cultural spheres that shaped it and keep shaping it" (UNESCO, 2011).

Definition of historic urban landscape

According to the paper "World Heritage and Contemporary Architecture - Managing the Historic Urban Landscape" (UNESCO, 2005) the historic urban landscape is the result of historic layering of cultural and natural values and characteristics. The term is extended beyond the notion of "historic center" and includes the broader urban context and its geographical setting. The historic urban landscape is embedded with current and past developments and consists of different character defining urban and natural elements. These are, for example, special organization of the urban environment and its use, visual relationships, topography, soils and vegetation, as well as all element of technical infrastructure.

The urban landscape approach aims at preserving the quality of the human environment and enhancing the productive and sustainable use of urban spaces. It provides general principles to meet the challenges and opportunities for the urban landscape as urbanization, globalization and development.

Principles for analytical framework

The main principles for application of the urban landscape approach are mostly about integration between old and new considering economic, environmental and human factors. They give guidelines how to analyze the historic urban landscape and how to proceed in the planning approach. Two principles of the Historic urban landscape approach I considered as most relevant and applicable for the riverbank development in Spandau. They are discussed in the next paragraphs.

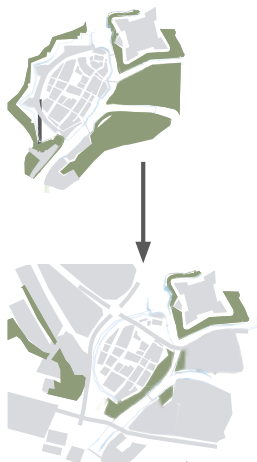
“Examine special context between old and new, while respecting integrity of historic fabric and building stock.” (UNESCO , 2005)

Analyzing the special context between old and new provides a base for further reflection on what should be preserved and what can be changed in the historic landscape. Main question is how to enhance the quality of the landscape. For my case I explored urban development over time in two scales. In a bigger context I followed the morphology of the riverbanks and the surrounding urban environment as a whole. In a smaller scale I investigated the Lindenufer bank and its relation to the Historic city to find main trends in the use patterns, which changed over time.

“Preserve the sense of the place, the integrity of the urban fabric, the identity of communities” (UNESCO , 2005)

UNESCO(2005) proves that emotional connection exists between human beings and their environment. Therefore the sense of place is fundamental to guarantee quality of life and contribute to the economic success of a city and to the social and cultural wellbeing of its residents.

I used these main principles to design analytical framework that aims at analyzing the morphology of the riverbanks to be able to integrate new development in the historic urban environment of the riverbanks.



Analysis of the morphology of the riverbanks over time

For the purpose, a study of how the riverbanks developed over time is required. Analyses of how the morphology of the area formed over time are made. A spacial- time matrix is elaborate in two scales: the observation focus in the bigger scale is mainly on the urban settlement around the riverbanks and how their function change in different time periods. Main trends of the periods are titles of each period.

Analysis of the morphology of Lindenufer riverbank

The smaller scale of time-spacial matrix encompasses the old city and Lindenufer, which is the site for in-depth design proposal.

The analysis of the urban development are the basis for the next principle of HUL , which I would like to follow and apply in the redevelopment concept



Objectives for sustainable riverbanks redevelopment

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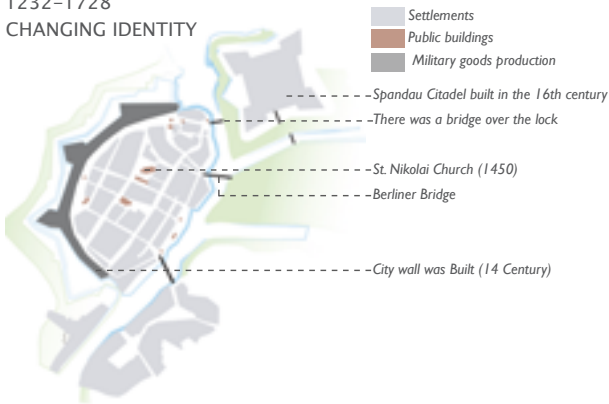
DESIGN LANDSCAPE THAT RELATES TO THE HISTORY

1.3.2. Analytical framework: Examine how the riverbanks developed over time

Analysis of the morphology of the riverbanks over time

1232-1728

CHANGING IDENTITY



The history of Spandau begins in the 7th century or 8th century, when the Slav Hevelli settled in the area and later built a fortress there. In 1156, the Ascanian count Albert the Bear took possession of the region and established a fortress here, from which the name Spandau originated.

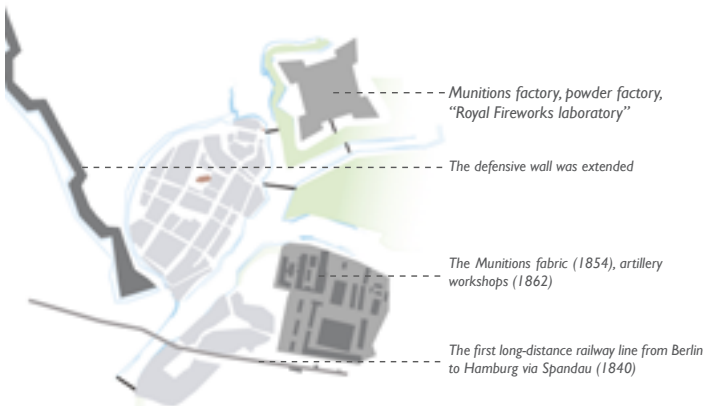
In 1231 Spandau was given city rights. At that time it was a commercial center

In 1485 it became again a fortress city and concentrated in the production of military goods

In 1450 St. Nikolai Church was built.

1844-1880

MILITARY SETTLEMENT



In the beginning of 19 Century the Citadel was established as an armor center. There were a munitions factory, powder factory and Fireworks laboratory

1880- 1903

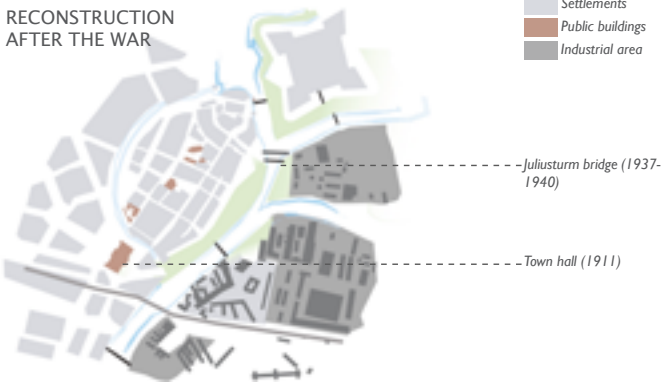
BETTER CONNECTIONS



In 1852 a second armor center was created. The Munitions factory (1854), artillery workshops (1862)-one of the most important arms sites were built on the Stresow- Frieheit meadows. Around 1890, the systems offer 12000 jobs.

In the next years Spandau expands and the population grows, new settlements were built on the east side of Havel.

1903– 1963 RECONSTRUCTION AFTER THE WAR



In 1945 destruction of the city was caused by air attacks during the Second world war.

After 1950 reconstruction of the city began. Many public and service buildings were built: District Court, tax office, police headquarters, district administration. The development plan provided administrative, trade and services in the old town. The small-scale constructions were replaced by larger building complexes.

1963–1983 EXPANSION



The late of 1960th projects for improvement of the transportation system were implemented. For example, the roundabout- Falkenseer Platz (1980), which allows bypassing of the historic inner-city, so that it became a pedestrian zone.

TODAY FUTURE BETTER INTERNAL CONNECTION



The city of Berlin develops strategies for improving the living, social and economic situation of Spandau. One of the strategies relevant to the project area is a construction of walking bridge for better connection of the citadel with the Historic town. Several suggestion for the bridges are given, but none of them is selected yet.

There are plans for better connection of the Old town with waterfront and activation the Lindenufer riverbank. The playground on the Lindenufer is currently under construction.

Fig. year 1232



Fig. Today



Analysis of the morphology of the riverbanks over time

In 1156 Spandau was established as a fortress

In 1231 Spandau was given city rights.

In 1485 it concentrated in the production of military goods

In 19 Century Spandau was one of the strongest fortresses of Prussia and was built to a center of defense industry

Analysis of the morphology of the Lindenufer riverbank

The character of the Lindenufer riverbanks started to change and serve as green area in the beginning of 20 Century.

Fig. year 1232



Fig. Today



Objectives for sustainable riverbanks redevelopment

- Create a better connectivity of the riverbanks and walking route that links the heritage areas: Old city, Munitions factory and the Citadel to strengthen the identity of Spandau as a Historic town.
- Link the old town with the riverbanks and the water over Lindenufer
- Consider place with nice views to historic landmark.

DESIGN LANDSCAPE THAT RELATES TO THE HISTORY

1.4. Design landscape that strengthens the identity

1.4.1. Place and space concepts

DEFINITIONS

Space: the area around everything that exists, continuing in all directions

Place: an area, town, building, etc.

(Cambridge dictionary [Accessed March 2014])

Space: is the boundless three-dimensional extent in which objects and events have relative position and direction. Physical space is often conceived in three linear dimensions, although modern physicists usually consider it, with time, to be part of a boundless four-dimensional continuum known as spacetime (www.wikipedia.org [Accessed March 2014]).

Place: an area with definite or indefinite boundaries or a portion of space which has a name (www.wikipedia.org [Accessed March 2014]).

Sense of place: a phenomenon in which people strongly identify with a particular geographical area or location (www.wikipedia.org [Accessed March 2014]).

Introduction

"Places are spaces that you can remember, that you can care about and make part of your life... The world should be filled with places so vivid and distinct that they can carry significance... Places could bring emotions, recollections, people and even ideas to mind." (Lyndon, 2001). This definition of places describes precisely the role of the sustainable landscape: to create sense of place. For that reason I think that the role of the landscape architects is generally significant, because they plan new or change existing places and spaces. To create the sustainable landscape a good understanding of the identity of the place is required.

For that reason I studied some Place and Space Concepts in order to be able to characterize the riverbanks in their context and as part of the place/space character. I found out that there are many approaches for analyzing and understanding places and spaces. I focused my research on several approaches: the Genius Loci concept, Kevin Lynch's cognitive space theory and Gordon Cullen methods for serial visual analysis.

In order to grasp the techniques for characterizing green and built environment, their spatial characteristics, I was confused what the difference between space and place is. Is the space a characteristic feature of the place, or on the contrary? What is major space or place is not really important as the main purpose is to characterize the landscape and its components. Sometime these terms overlap and have the same meaning and the authors use them as synonyms. For me space is a more abstract definition of the place, while place is more physical and has boundaries. That is also what I found about the notions of space and place in some of the literature.

Genius Loci

Norberg-Schulz (1980) writes about the spirit of the place 'Genius Loci'. This is a Roman concept stating that every independent being has its genius, its spirit. This spirit gives life to people and places and determines their character. The spirit can be experienced, especially when a visitor sees a place for a first time. Sometime the spirit of a place, such as landscape or urban environment, is so valuable that it may serve as inspiration for writers and artists, or it may turn the place into a tourist attraction. Norberg-Schulz (1980) also gives guidelines how to identify the spirit of the place and its components: structure, outside- inside relation and boundaries. They should be should be characterized in terms of identity and character. The space is three dimensional organization of these elements and may be also understood as the place's character- the general atmosphere of the place.

Therefore, it is important for planners and designers to feel the spirit of the place, to see the qualities of the place and its potentials. Designing natural or human-made landscapes, open spaces or built up areas is depending on the structure of the place, its boundaries, its character, its relation with other places. In order to describe the spirit of the place it is necessary to identify them.

Structure

Every place has a structure. The structure of a landscape consists in its extension. How a natural place extends gives its particular character and special parameters. For example, the extension of on a flat plane is general and infinite, while the relief creates directions and defines spaces.

Personality of a place

A place's personality may be defined by its surrounding or particular elements. Sometimes places appear to be protected by the surrounding environment, or to be exposed and create a feeling of insecurity. In other cases natural elements of very particular shape give a place its character.

“Outside- inside relation”

Outside- inside relation is also an important feature of the spaces, which determines the degree of “extension” and “enclosure” of the space. “Whereas landscapes are distinguished by a varied, but basically continuous extension, settlements are enclosed entities”. In some cases this relation is important for the identity of the place and should be preserved, otherwise the landscape may lose its identity.

The enclosed spaces may be observed as centers of surroundings, from which “varying degree of continuity” extend in horizontal and vertical directions- the directions of sky and earth. The centralization gives a focus of the extension. It is the starting point of the transition from enclosed to open spaces.

Boundaries of the spaces

The enclosure is defined by a boundary. The boundaries of a built space are well known - floor, wall and ceiling. The boundaries of a landscape are similar; they are ground, horizon, and sky. This parallel is basic for the relationship between landscape and man-made places. The enclosing boundaries, as for example the walls, make the spaces recognizable.

The cognitive space

Kevin Lynch's book *The image of the city* (1960) reports that people understand their surroundings in consistent and predictable ways, forming mental maps with five main elements: paths, edges, districts, nodes and landmarks, which can be understood as elements of the space. By analyzing how people perceive city space he concludes that there are 2 aspects of the image of the built environment. The first one is its 'legibility', which is the visual clarity of space and the ease with which its parts can be recognized. The second is 'imageability' - the quality of a physical object which evokes a strong image in any given observer. It can be shape, form, or color which makes mental images of the environment more vivid. 'Legibility' and 'imageability' are the parameters through which it is possible to analyze the mental image that the urban environment creates. Lynch investigates the perception of urban landscape to provide new design principles for the development of the city. He outlines some design strategies for the five elements of the space: paths, edges, districts, nodes, and landmarks.

Paths are the streets in the city. They are very important, as the urban environment is experienced by moving on them. Therefore, paths should be well defined with clear beginning and ending. They also need to have landmarks, which make them recognizable.

Edges provide the spatial boundaries of urban structures. They have to be well defined but in the same time also to connect to other urban structures. Edge is for example a waterfront or green area around a neighborhood.

Districts are large homogeneous urban structures, as for example residential areas or industrial zones. They are the main components of the city. They should distinguish themselves visually from each other so that the passers-by are aware of their functions or use.

DEFINITION

Cognitive space: uses the analogy of location in two, three or higher dimensional space to describe and categorize thoughts, memories and ideas. Each individual has his/her cognitive space, resulting in a unique categorization of their ideas. The dimensions of this cognitive space depend on information, training and finally on a person's awareness. (<http://en.wikipedia.org> [Accessed March 2014])

Nodes are points that require extra attention from the observer; usually crossroads along streets. They should be made distinct through edges and landmarks.

A landmark is everything that stands out that can help an observer orient himself. It can be attractive or not so attractive, or it can be something that contrasts with the background.

Lynch defines in his work also ten important qualities of the cognitive space: singularity, simplicity, continuity, dominance, clarity of joint (emphasis on strategic intersections), directional differentiation (asymmetry), visual scope (view points) and motion awareness (to be aware of the speed of moving), time series (series experiences over time), names and meaning. These qualities may be applied to each element when designing qualitative urban environment which is functional and easy to orientate in.

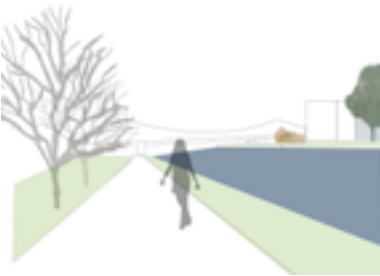
Perception of a place

The term serial vision developed by Gordon Cullen is method for describing what a pedestrian experiences when moving in the city. He studies the urban environment by sketching the views one perceives while walking in the city. He defines two types of view: the existing view and the emerging view. The frequency with that the existing view changes to emerging have impacts on the experience of walking in the city. For example, the pedestrian's view continually changes when following a curving pathway, entering a courtyard, or turning a corner. In this case "the changing view provides a sense of discovery and drama", while a long straight road is monotonous, because the initial view is soon immediately perceived (Cullen 1961).

In my opinion by using this knowledge urban planner are able to design the environment which provides an emotional impact in the pedestrians.

Analytical framework

In my proposal for riverbanks redevelopment I wanted to consider the sense of the place and its identity. I investigated the site's characteristics components, as for example landmarks, the old city and its relation to the riverbanks with sections and elevations of the riverbanks. The site visits helped me to feel the spirit of the place and I also tried to capture it by making serial photos and describing them



● Explore riverbanks' characteristic components, as for example landmarks, the old city and its relation to the riverbanks

● Define the character of the riverbanks

● Analyze what the pedestrian experiences when walking on the riverbanks

● Objectives for sustainable riverbanks redevelopment

?

DESIGN LANDSCAPE THAT STRENGTHENS THE IDENTITY

"Preserve the sense of the place, the integrity of the urban fabric, the identity of the communities." (UNESCO, 2010)

1.4.2. Analytical framework: Analyze the identity of the riverbanks

Explore riverbanks' characteristic components



Transitions / relations: built environment– open space

The section below shows the transitions from built environment to the open space by the water on three important places. The development from both sides of the river, building heights, building use and public availability are illustrated.

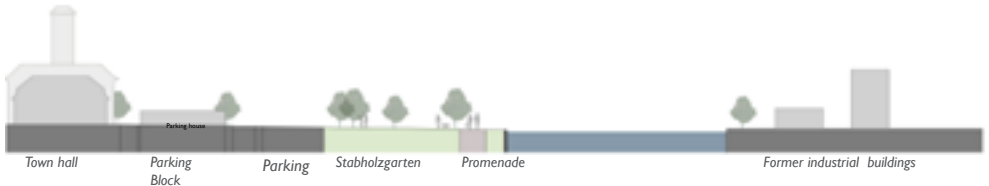
Section A-A shows the Municipality of Spandau and Stabholzgarten on the north-west side of Havel, which can be described as lively and public. On the other side, the riverbank is inaccessible, because there are two abandoned industrial buildings.

Section B-B cuts through the Old city, which is full of life and activities. In the core of it there is a market place and mix-used building. In the periphery there are residential buildings and the public use decreases towards the riverbanks. Therefore, the Lindenufer riverbank is less public than Stabholzgarten. In addition, the Former Munitions factory on the other side of Havel creates a sense of abandonment.

Sections C-C cut through the oldest part of the Old city- the Kolk, the Havel lock, Citadel's green ring and fortress. It shows the potential of connecting the historic urban structures from both sides of the river.

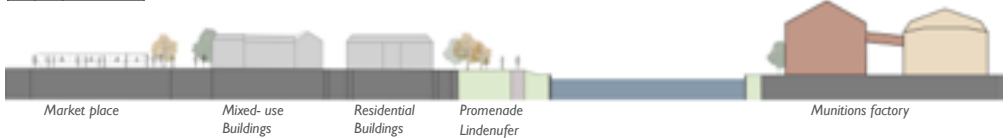
SECTION 'A-A'

0 10 20 50m



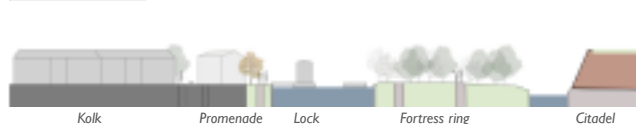
SECTION 'B-B'

0 10 20 50m



SECTION 'C-C'

0 10 20 50m



1.4.2. Analytical framework: Analyze the identity of the riverbanks

Inventory in a smaller scale- Riverbanks and surroundings

“Outside– inside relation”: Lindenufer– Old city

As addition to the sections the pictures show views form key points from the river banks to the Old city and respectively from the Old city to the open space. They capture the outside-inside relation between the built structure and green space on the Lindenufer riverbank.

Fig. 1.12

View to town hall from Stabholzgarten



Fig. 1.13

Walking to Stabholzgarten. Town hall in right

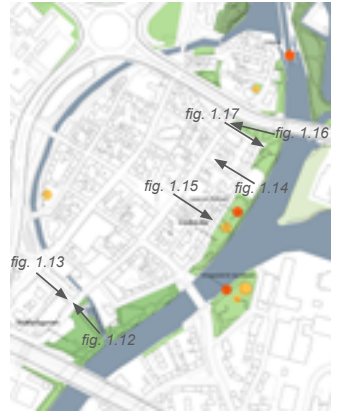


Fig. 1.12, 1.13

The outside-inside relation is tangible. The well enclosed city space contrasts with the open space. A gate defines the outside and inside spaces.

Fig. 1.14

From Lindenufer (parking) to historical town and St. Nikolai church



Fig. 1.15

Walking from the historical town to Lindenufer



Fig. 1.14, 1.15

The inside space of the Old town with its landmark- the St. Nikolai church attracts the observer's intention. On the contrary being inside the town, the observer barely perceives the open space by the riverbanks. The boundary between inside and outside is once again very present.

Fig. 1.16

View from Lindenufer to Historical town



Fig. 1.17

View from the marginal of the Historical town to Lindenufer



Fig. 1.12, 1.13

On this spot the open space is more dominant, but the observer also perceives the compact structure of the Old town. Outside- inside connection completely different in comparison with the other two cases. There is a clear imbalance in the outside- inside connection deriving from the inviting, cosy city space and unstructured, neglected open green space

1.4.2. Analytical framework: Analyze the identity of the riverbanks

Character of the riverbanks



Elevations of the riverbanks

The elevations of the riverbanks illustrate the boundaries of the open space and the perceived landmarks, which stand out from the built structure: The municipality of Spandau, St. Nikolai church and the Munitions factory. They also show that the existing greenery makes the urban environment more picturesque. The vegetation captured on the elevation is with its autumn colors. The broad-leaf trees on the riverbanks are extremely valuable, because they create seasonal dynamic while changing their appearance and color during the seasons.

RIVERBANK ELEVATION A-A



RIVERBANK ELEVATION B-B



I.4.2. Analytical framework: Analyze the identity of the riverbanks

Character of the riverbanks

Lindenufer riverbank



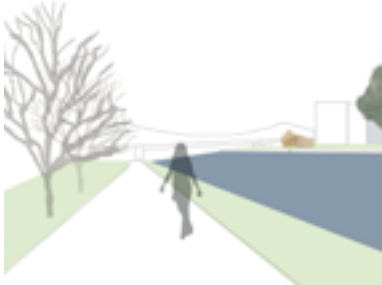
1.4.2. Analytical framework: Analyze the identity of the riverbanks

The bridges as space defining elements



The four bridges over the riverbanks are documented below. They are diverse with their different architectonic features and add to the identity of the riverbanks. Additionally, they offer different perspective for observing the riverbanks, when walking under or over them (fig 1.21, 1.22, 1.23).

Fig. 1.21
The Railway bridge in the emerging view



1. Juliusturm bridge



Fig. 1.22
On the top of the bridge



2. Charlotten bridge



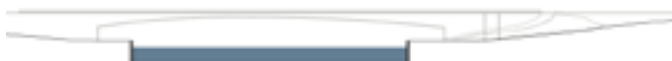
3. Railway bridge

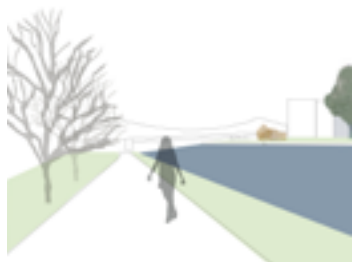


Fig. 1.23
Under the bridge enclosed space, framing the view to the open space



4. Dischinger Bridge





Explore riverbanks' characteristic components, as for example landmarks, the old city and its relation to the riverbanks

Lindenufer riverbank is outside the lively public old city, it is extraneous part of the old town.

Define the character of the riverbanks

The old city skyline creates a beautiful boundary of the riverbanks by Lindenufer and Stabholzgarten. On the opposite side of the river undeveloped riverbanks and the industrial skyline are perceived.

Analyze what the pedestrian experiences when walking on the riverbanks

Bridges are significant for experiencing the riverbanks. They create dynamic and enjoyment in the perception of the open space by observing them, walking in their underspaces or simply walking on them.

Objectives for sustainable riverbanks redevelopment

- Connect both sides of the riverbanks by transforming the undeveloped riverbanks.
- Strengthen the identity of Lindenufer riverbank.

DESIGN LANDSCAPE THAT STRENGTHENS THE IDENTITY

"Preserve the sense of the place, the integrity of the urban fabric, the identity of the communities." (UNESCO, 2010)

2.1. SWOT

Fig 2.1
PROJECT AREA
Mapping of the main strengths and weaknesses



Strengths

Location: Historic city of Spandau and Citadel Fortress, Munitions factory and the industrial area as part of history of Spandau.

Infrastructure: Convenient and well developed public transportation network, Railway Station, Shipping and boat trips for tourists.

Identity: Diverse Bridges.

Valuable green spaces: Citadel Ring, Stabholzgarten, Stresow park.

Social structure: Concentration of social infrastructure in the Historic town of Spandau.

Weaknesses

Location: in close proximity to industrial area.

Infrastructure: Main streets are barriers for pedestrians in the old city.

Fragmented and heterogeneous riverbanks: undeveloped river banks on the east site of Havel, inaccessible riverbank in the industrial area,

Missing links between green spaces.

Parking lot on Lindenufer riverbank.

Empty building: munitions factory, former post office and former industrial buildings.

Low biodiversity

Fig. 2.3
THE ADMINISTRATIVE DIVISION 'BZR SPANDAU-MITTE'

LEGEND

- Green areas
- Forests
- Agriculture
- Riverbanks close to the Old city
- Important green zones
- 20 Green Walks in Berlin®



Opportunities

To attract:

- visitors from the region and the whole country due to the Railway Station and well functioning public transport (see p. 9, fig. 1.12);
- tourists due to attractive old city, munitions factory and Citadel Fortress.

To be connected:

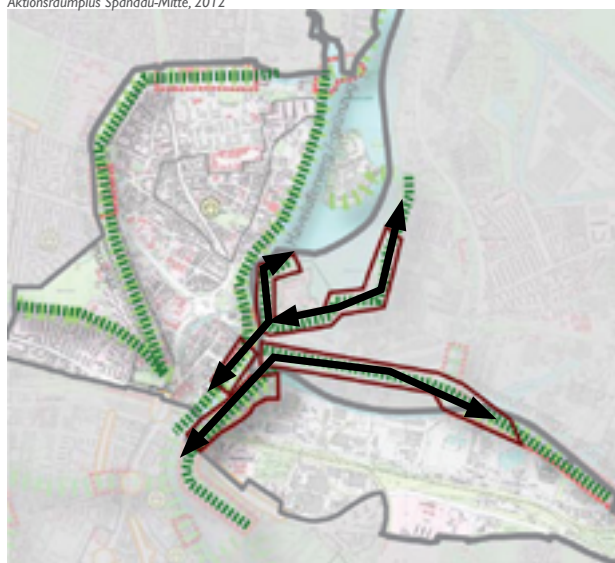
- into a sequence of diverse green spaces within the project areas;
- to Berlin's green ways and important parks in Spandau (see fig. 3.2).

To be active:

- to be amongst the most important public green spaces in Spandau due to their location in the borough center by integration of green infrastructure services (see fig. 3.3);
- social interaction by the water and improve residents well-being.

To be ecologically restored riverbanks

Fig. 2.4
THE BOROUGH OF SPANDAU
Source for map underlay: Integriertes Stadtteil Entwicklungs Konzept
Aktionsraumplus Spandau-Mitte, 2012



LEGEND

- Missing connections of green corridors
- Main green corridors (20 Green ways of Berlin)

Opportunity

- Connect

Threats

Far from the center of Berlin

Missing connection in the green network disconnect green spaces from Berlin's green ways and important parks

Disadvantaged population (unemployed, and with immigration background) is hard to reach and to encourage for social interaction.

Unappreciated waterfront as in the past.

2.2. The sustainable vision explained

Design principles

1. Design landscape that supports both ecosystem services and human well-being.
2. Design landscape that relates to the history of Spandau.
3. Design landscape that strengthens the identity of the riverbanks.

Objectives for sustainable development

- Create valuable biotopes to increase ecosystem functions and to create healthy urban environment.
- Optimize the potential of the riverbanks for recreation.
- Make riverbanks accessible by connecting them with new paths and bridges.
- Create a better connectivity of the riverbanks and walking route that links the heritage areas: Old city, Munitions factory and the Citadel to strengthen the identity of Spandau as a historic town.
- Link the old town with the riverbanks and the water over Lindenufer
- Consider places with nice views to historic landmarks
- Riverbanks as valuable place for recreation for residents and visitors

Opportunities

To attract:

- visitors from the region and the whole country due to the Railway Station and well functioning public transport.
- tourists due to attractive old city, munitions factory and Citadel Fortress.

To be connected:

- into a sequence of diverse green spaces within the project areas;
- to Berlin's green ways and important parks in Spandau.

To be active:

- to be amongst the most important public green spaces in Spandau due to their location in the borough center by integration of green infrastructure services
- social interaction by the water and improve residents well-being.

2.2. The sustainable vision explained

The sustainable vision

Green sequences
Sustainable riverbanks as sequence of diverse public, natural and recreational green spaces by the water.

Whom?

Residents, visitors, tourists

Strategy

Use heterogeneity, conflicting use patterns of the riverbanks and contrasts in built up areas and green spaces.

Why?

To improve human- wellbeing (spiritual and physical health), attract visitors, restore environmental health.

Implementation of the strategy

1. Connect fragments, contrasts, conflicts
2. Activate for public use and social interaction
3. Restore ecosystem functions and ecology the riverbanks

Result

Wellbeing benefits

Opportunities to:

- walk, experience, see
- meet, socialize, recreate
- recover physical and spiritual health

2.2. The sustainable vision explained

The strategy

Figures:

Example for contrast between the appearance of the river banks (see p. Character of the riverbanks)

Fig. 2.5

Soft edge- unchanged riparian zone and hard edge river bank on the opposite side of the river



Fig. 2.6

Riverbank by allotment gardens



Fig. 2.7

On the opposite side



Use heterogeneity, conflicting use patterns of the riverbanks and contrasts in built up and green spaces

The banks of the Havel and Spree at their confluence are characterized by different spaces: developed and undeveloped riparian zones, industrial and commercial areas, parks, historical urban landscapes, as the old town, the citadel and former munition factory (fig. 2.8). Currently there many contrasts and conflicts between these spaces as a result of a development over a long time and changing use patterns. Today the banks of the Havel and Spree are heterogeneous place defined by the use and appearance of fragmented green areas and built environment (fig. 2.5- 2.7).

By emphasizing on the heterogeneity as main feature of the area, it is possible to redevelop the area into an attractive and diverse place with new identity, which relates the banks with is historical morphology, strengthen their connections with the heritage areas. By implementing the strategy the riverbanks become an open-space sequence of public, cultural recreational spaces. Their new identity outlines the characteristics of the different green fragments and links them together to create a sustainable landscape that supports social and ecosystem services.

Fig. 2.8

THE CONTRASTS

- Cultural Heritage areas
- Citadel Fortress
- Historic City of Spandau
- Former munitions factory
- Industrial zone

Human affected green riverbanks

Parks: Lindenufer, Stabholzgarten, Stresow

Nearly- natural riverbanks

Fortress ring

Unaccessible riverbank in the industrial zone



2.2. The sustainable vision explained

Implementation of the strategy

1. Connect fragments, contrasts, conflicts



bike



walk



experience water



nice view

2. Activate for public use and social interaction



recreate



new use for empty buildings



play



meet



culture

3. Restore ecosystem functions and ecology



Increased biodiversity



Transformation of impervious surface



Water purification with floating meadows



Phytoremediation to clean soil contamination

{PART II} FROM SUSTAINABLE VISION TO A DESIGN PROPOSAL

{CHAPTER 3} "GREEN SEQUENCES" RIVERBANKS REDEVELOPMENT






{CHAPTER 4} LINDENUFER TRANSFORMATION








LEGEND

Connections

-  Walkways
-  Circular walk
-  Promenade of Light and Shadows
-  Berlin's Green ways
-  Connection point to Berlin's Green ways

- ① page 56
- ② page 64
- ③ page 61
- ④ page 62
- ⑤ page 62

Bridges

-  Skate park
-  Underspace for culture
-  Illumination









SECTIONS

- C-C** page 55
- D-D** page 61










Buildings

-  Former Munitions factory: Ateliers, workshops, galleries
-  Former industrial buildings: Mix- use (housing, offices)
-  Former post office: Offices

Open space

-  Ecological restoration
 -  Plants for phytoremediation
 -  Parking lot transformation
 -  Floating meadows
 -  Increased biodiversity
-  Allotment gardens
-  Green in residential
-  Public Parks

Activities

-  Sunbathing
-  Canoeing
-  Tourist Boat stop
-  Fishing
-  Seating by the water
-  View point
-  Pavilion for tourist Information
-  Playground
-  Walk & bike

Unfold next page(52) to see the whole Masterplan!



3.1. Connected riverbanks

3.1.1. Circular walk

Circular walk (see fig. 3.2)

A circular walk is designed to connect riverbanks contrasts (see fig. 3.1) in a new sequence. It enables the visitors to experience the walk and takes them not only from place to place, but also from history to present and future, by linking the Citadel with the former munitions factory and the old town of Spandau with new development and the industrial area, which in a constant change defined by the ever altering needs of the city.

The notion of the walk is to expose the contrasting places with preserved, restored or changed functions and/or appearance:

- Heritages areas as object of conservation and preservation
- Industrial area with new attractive appearance and integrated public functions
- Green areas and with restored ecosystem functions
- Parks for extensive use for recreation and play.

Components of the walk

New bridges

Two new pedestrian and cycling bridges are planned, which enable the circular walk. The first one connects the citadel with the Historic city over the lock. The second connects the Citadel with the Munitions factory at the confluence over the Spree and Sofieweder island.

The new bridges supplement the variety of the bridges over the Havel, which adds to the diversity of the riverbanks and enables different sensual experience of the open place by the water, when walking on them, observing them or passing under them.

New visual connections between opposite riverbanks (see fig. 3.3)

The circular walk makes part of the industrial zone accessible for visitors, what reveal nice views from all sides of the confluence. Walking on it provides a visual and emotional experiences by perceiving the confluence from different places along the river banks or on the bridges when crossing the rives Spree and Havel.

Landmarks and focal points connection (see fig. 3.4)

The circular walk and new alleys connect landmarks and public buildings in old city with the Citadel and the Munitions fabric which is restored and transformed into a public building with a square. Three other empty buildings on the riverbanks are also suggested for restoration. They are suggested for mix-used development with housing and offices, in order to activate the river banks.

Fig. 3.1.
Fragments of the riverbanks



Fig. 3.2
Circular walk

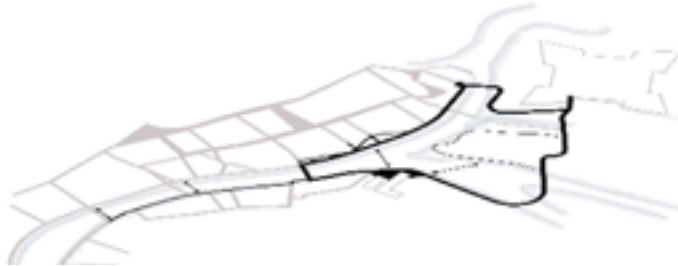


Fig. 3.3
Visual connections

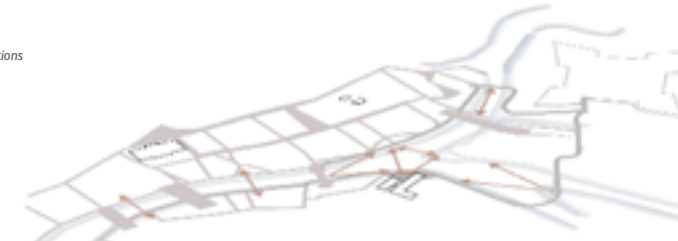


Fig. 3.4.
Focal points connections



3.1.1. Circular walk

New bridges

Fig. 3.5
The bridge to the Citadel

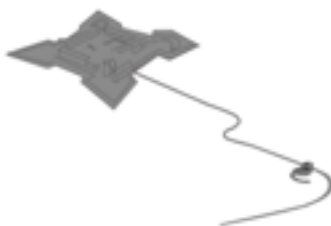
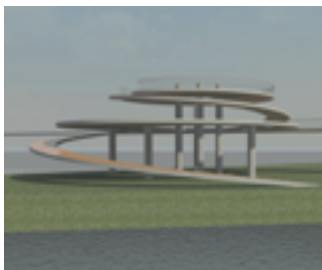


Fig. 3.6
Terraces of the bridge for panoramic
View in the area



Bridge to the Citadel

A new bridge is designed as a main element of the Circular walk . It connects the riverbanks with the Citadel over Spree river and Sophie- Weder island (see fig. 3.5). The bridge responds the shipping passing profiles with its clearance of 5,5 m. It lands with ramps with 4% slopes. The ramps allow barrier free access to the bridge from the banks and the island. In addition, there are 2 terraces on the island, which facilitate furniture for recreation and enjoying the panoramic view in the area in different heights. The highest level of the bridge is with elevation of 9 m above water level (see fig. Elevations of bridge terraces). The spiral design of the bridge levels on the island enables once again a barrier free access (see fig. 3.6). Moreover, moving in the circle is a way for experiencing the water and the panoramic view in the area. The bridge is a “ meeting point of the contrast”, where one can perceive the confluence of the rivers and in the same time the industrial park and industrial zone.

Bridge over the lock

A footbridge is suggested to connect the Citadel fortress ring with the Kolk over the lock. The crossing in this part of the riverbanks was possible in the past, since the lock was built (see pages 25, 26) until its demolition, when the bridge didn't match the new shipping transportation demands around 1950s, when bigger ships were allowed to sail on the Havel- Spree waterway. Today the need for building the bridge is tangible as also pointed out in the city urban development plans for Spandau (Planwerk Westraum Berlin. Ziele, Strategien und landschaftsplanerisches Leitbild, 2004). The bridge links the Citadel fortress with the old city in the most convenient and cost effective way, because of the narrow riverbed. The addition of the bridge closes the circle of Circular walk.

SECTION 'D-D' ELEVATION OF THE BRIDGE'S TERRACES

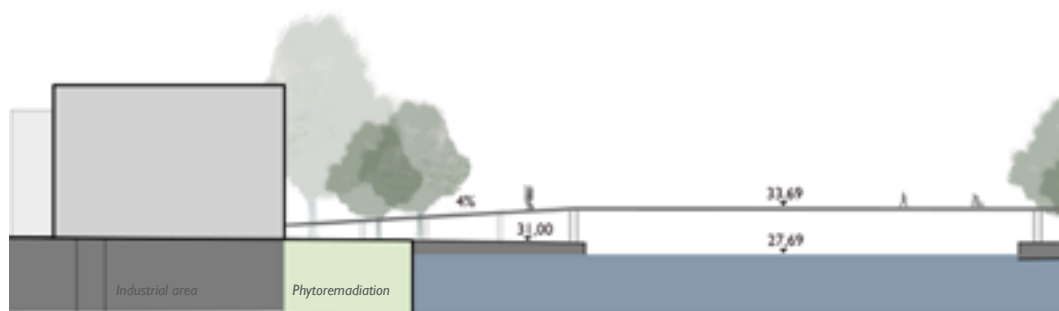
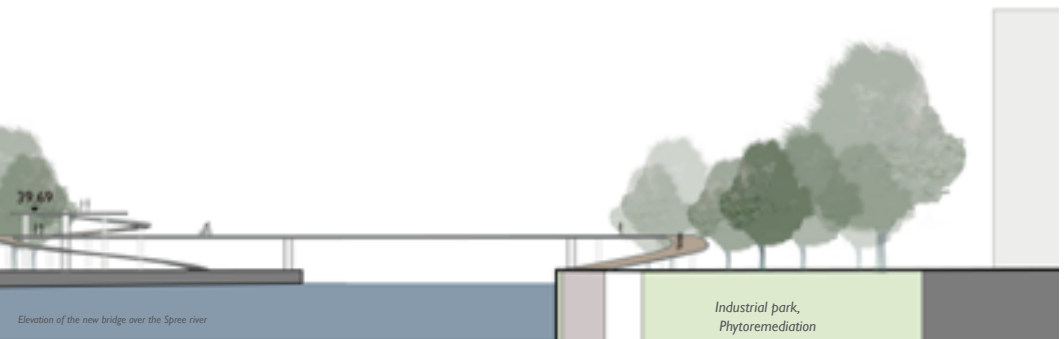


Fig. 3.7
New bridges



3.1.2. Promenade in light and shadows

Part of existing promenade on the north- west riverbank of Havel is transformed in to "Promenade in light and shadows".

During day time the bridges are remarkable with their different scales, architectonic values and the under spaces (See p. 37, 38). They add value to the promenade. They are incentive, particularly for first- time visitors, to walk on the riverbank, in order to explore them. The bridges frame enclosed, shaded spaces on the promenade. While walking, one can experience cold in the shaded passages of the bridges and sun in the open space, a play of sun and shadows on the promenade.

However, this pleasant contrasts disappear at night and bridges underpasses resemble scary and unsafe "black holes".

The illumination concept aims at transforming them in to visible, inviting and safe passages. Only by using the architectonic values of the existing bridges and adding attractive illumination in the passages, walking on the promenade could provide a new experience for the visitors and activate the riverbanks at night. A common illumination design for the four bridges links them to revive the play of shadows and light on the promenade and in the same time highlights unique features of every bridge to create a night- time impression of them (see fig. 3.10)

Promenade in Light and Shadows on the north- west side of the river

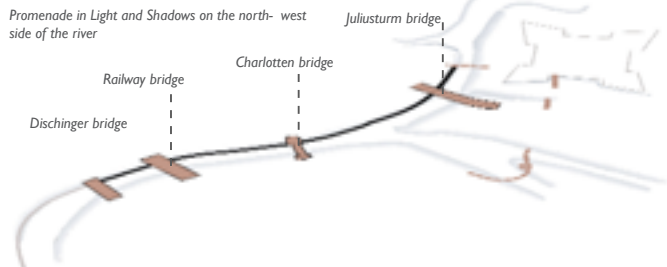


Fig. 3.8
Charlotten bridge



Fig. 3.9
Under space Dischinger bridge, in the background Railway bridge



Fig. 3.11
Bridges illumination design by ÅF
Source: www.enlightermagazine.com [Accessed March 2014]



REFERENCE

Bridges illumination design by ÅF – Hansen & Henneberg (fig. 3.11, 3.12)

A lighting design for Danish motorway bridges is designed to increase the security of the traffic below.

Two different types of lighting are used. The first type uses chiaroscuro (the interplay between light and shadow) to create contours on edge beams facing oncoming traffic. The second type, "atmospheric lighting", illuminates the bridges' supporting columns with colored light.

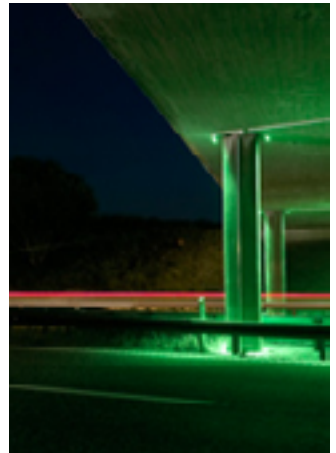
The bridges' edge beams are illuminated using gobo projectors, that give of light in a particular pattern) equipped with standard metal halide lamps. The gobo lighting consists of fir tree patterns characteristic of the trees in the surrounding area. Chiaroscuro is thus used to create a unified impression that refers to the surrounding plant life and landscape.

<http://www.enlightermagazine.com/projects/motorway-bridges-island-fyn-denmark>, [Accessed March 2014]

Fig. 3.10
Envisioning light concept for the Promenade in Light and Shadows



Fig. 3.12
Bridges illumination design by ÅF



3.2. Activate riverbanks for public use and social interaction

Fig. 3.13
Munitions factory



Fig. 3.14
Active bridge underspace



Fig. 3.15
Skate park under bridge in Stockholm, Sweden



Activation of empty buildings (fig 3.16)

By the local site analysis of the built structure of the riverbanks several empty buildings were identified. The buildings of the Munition factory at the confluence of Havel and Spree, the Former post office and 2 industrial buildings in the east side of the project area. The master plan includes proposals for new uses of these buildings in order to activate the green areas around them by the river (See Fig. 3.16).

The Former Munition factory's buildings (See Fig. 3.13) have a particular need for restoration and transformation. Both buildings are listed and have high esthetical value. Due to their prominent location at the confluence of Havel and Spree, they are perceived as a landmark. Activating them by proposing public use increases the riverbanks potential for creating valuable public meeting place by the water.

Activation of bridges' underspaces (fig. 3.17)

The analysis of the bridges along Havel river revealed that the bridges underspaces have a great potential for facilitating public places. For two of the bridges proposals for new functions are given according the social needs defined by the analysis of the social infrastructure. The railway bridge's underspace has the necessary size to accommodate attractive skate park for the young residents of Spandau, who are missing facilities for age- appropriate activities (See Fig. 3.15).

The space under Juliustrim bridge is suggested for flexible public space for different seasonal and cultural activities. In the summer it can be transformed in to small cinema (See Fig. 3.14) and in the rest of the time it can serve as exhibition place. Its location on the route of circular walk and the closeness to the Old town is a good premise, that the under space will be appreciate by the passers-by.

Activation of the open-spaces (fig. 3.18)

The focus of the Master plan is set on the activation of the green space by the water. The sequence of different parks and public open spaces is linked by the circular walk. Planned and existing recreational activities are lined together and made accessible by new walkways in the project area.

The most significant interventions are:

Redevelopment of the riverbanks at the confluence of the rivers Have and Spree, which is the most attractive place in the project area and includes:

- Transformation of the Lindenufer riverbank as green extension of the old city, which is currently poorly used because of lack of attractive facilities for recreation and play.
- New meeting square in front of the Munitions factory
- Forestry park with lawn for sunbathing
- Industrial park in the edge of the industrial zone along the circular walk is planned to create attractive industrial edge and to clean the contaminated ground through phytoremediation.

3.2. Activate riverbanks for public use and social interaction

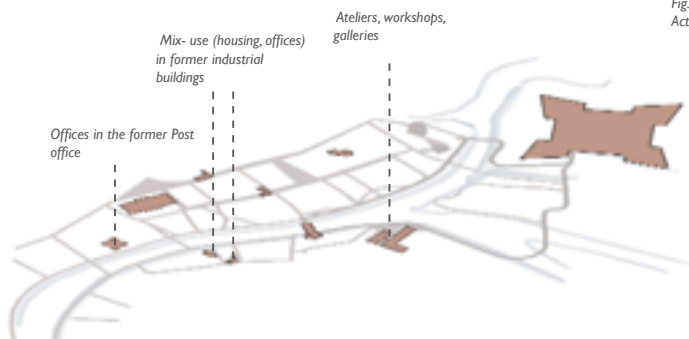


Fig. 3.16
Activation of empty buildings for public use

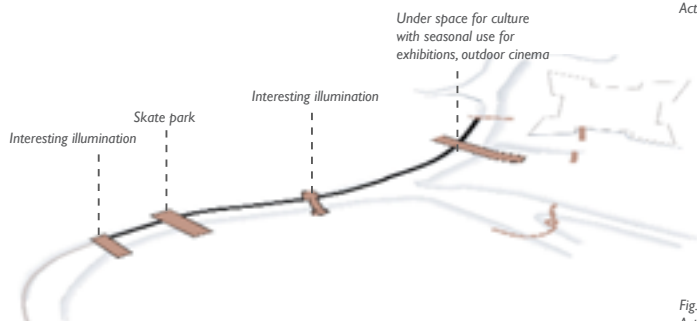


Fig. 3.17
Active underspaces



Fig. 3.18
Active open-space

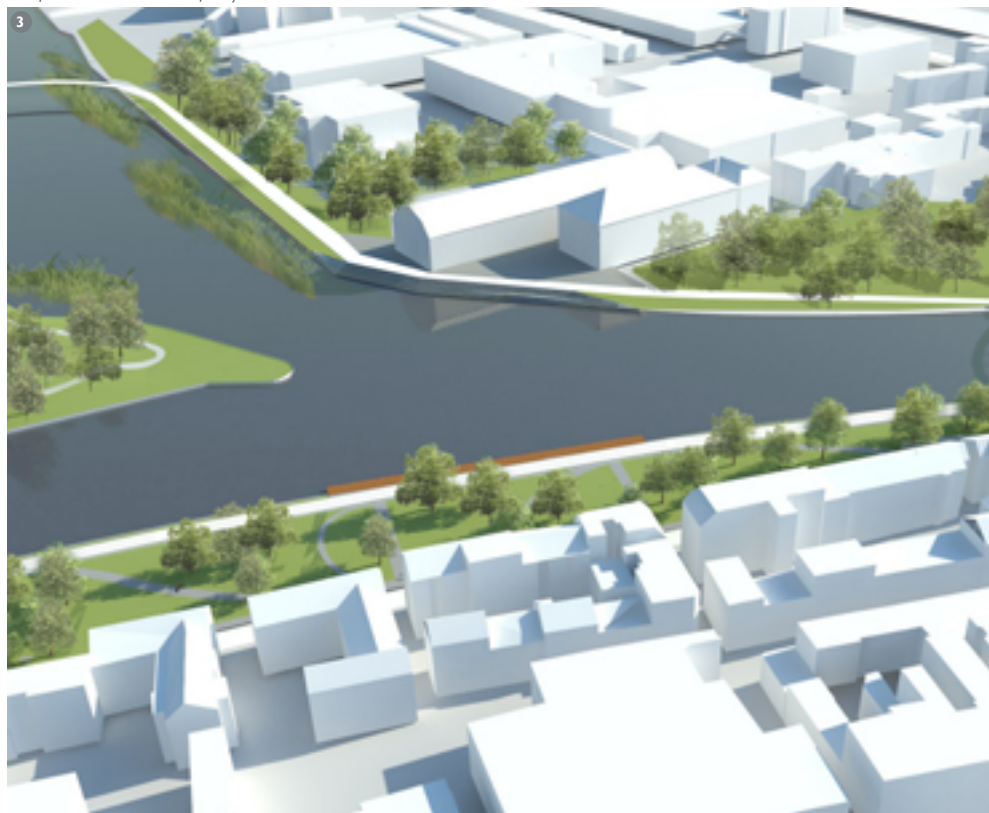
3.2. Activate riverbanks for public use and social interaction

3.2.1. At the confluence of Havel and Spree

Fig. 3.19

At the confluence

The development at the confluence enables visual communications. The riverbanks are active and social place that connects the old city with the waterfront and the Old munitions factory.



SECTION 'C-C' LINDENUFER- PUBLIC SQUARE- INDUSTRIAL PARK



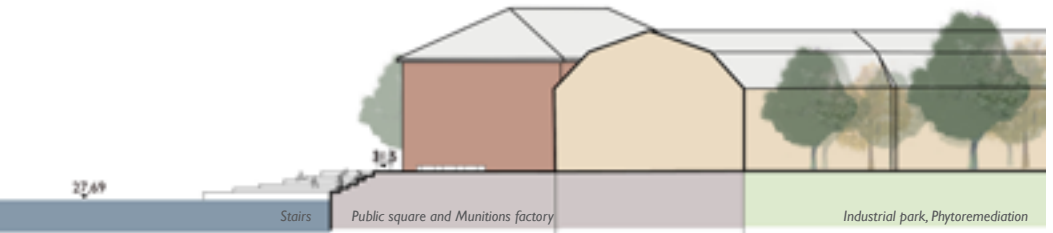
Fig. 3.20
View from the Green Edge to Public square and Lindenufer



Fig. 3.21
Bird view to Public square



Fig. 3.22
A water feature on the stairs.



3.2.2. Industrial park

Fig. 3.22

Armory industry in Spandau in 1869

Source: www.firmenverzeichnis-spandau.de, [Accessed March 2014]



Fig. 3.23

Industry area today: small business, production, commercial areas



The industrial area is important part of the history of city (fig. 3.22, 3.23). In 19 Century Spandau was one of the strongest fortresses of Prussia and was a center of defense industry. The industrial area changed over time and continue to change in present, because of shifting and unpredictable economical trends.

The new development will make it possible for visitors to observe the new developments in the industrial area, which are constantly changing its appearance.

Industrial park is located on the edge of the industrial area, along the path and the bridge which connect the former munitions fabric with Citadel. It creates a green buffer that makes the industry more attractive and sustainable with affluent vegetation. Moreover, vegetating with selected plant will clean the pollutants in the ground caused by the Munitions factory (see p. 67).

The aim is to integrate the industrial zone in the redevelopment concept, as a part of the experience, when one walks on the circular path to reach the Citadel. Appropriate light installations and vertical vegetation would transform the industrial skyline without confronting current uses and even make the industrial area attractive for more public oriented commercial development, which is an opportunity for reusing empty building stock.

Reference: Landscape park Duisburg–Nord, Germany

Landscape park Duisburg-Nord, Germany is one of the most popular examples for transformation of former historical industrial area. Light installation are one of the means to transform the industrial area into a park. This is also possible solution for the industrial skyline in Spandau.

Fig. 3.25

Landscape park Duisburg-Nord, Germany



Source for fig. 3.25- 3.27: <http://www.landschaftspark.de/der-park> [Accessed May 2014]

Fig. 3.24 Industrial park along the circular path

Affluent vegetation along the circular path serve as both green buffer around the industrial area, that improves the ecological state of the riverbank by cleaning the soils and water on site from the pollutants caused by the industry, and as a green curtain that increase the visual quality of the industrial edge.



Fig. 3.26

The contamination was a great concern in Duisburg-Nord, before the transformation. Its designer Peter Latz dealt with the problem with the method of phytoremediation to clean soils and water on site.



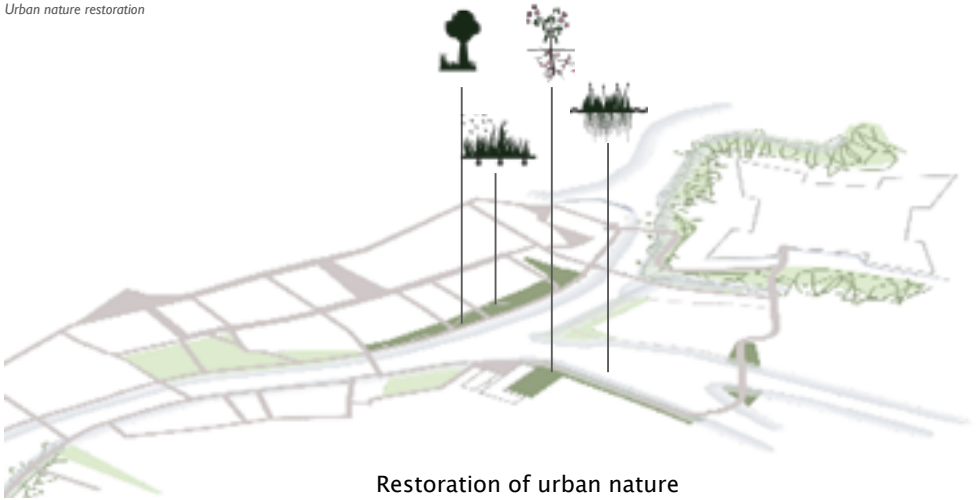
Fig. 3.27

Phytoremediation in Landscape park Duisburg-Nord, Germany



3.3. Restored urban ecology and ecosystem functions

Fig. 3.28
Urban nature restoration



Restoration of urban nature

Improvement of the ecosystem functions of the riverbanks is achieved by increasing the biodiversity of the riverbanks, establishment of healthy riparian zones, replacement of impervious surfaces and water purification with floating meadow. These measures are integrated in some of the green areas, which require more attention as for example in the industrial zone and Lindenufer because of the vast parking lot, which takes up 1/3 of its area and should be removed as a source of noise and air pollution for the residents in the old city

4.3.1. Increased biodiversity

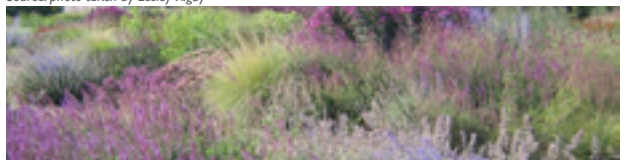
Biodiversity refers to “richness and distribution of species living in a given area”. The design, construction and maintenance of spaces in which we live, work and play can affect biodiversity. Common drivers of biodiversity loss associated with site development include spreads of pollutants, loss of habitat for plants and animals. There is a connection between biodiversity and human well-being. Habitat loss causes reduction of habitat quality and ecosystem services. (Venhaus, 2012)

Low biodiversity is indicated by vast lawns and lack of other types of herbaceous vegetation. By introducing ornamental perennial plants to provide better stormwater management and high esthetical value.

Fig. 3.29
Green area on Lindenufer is mainly covered by lawns.



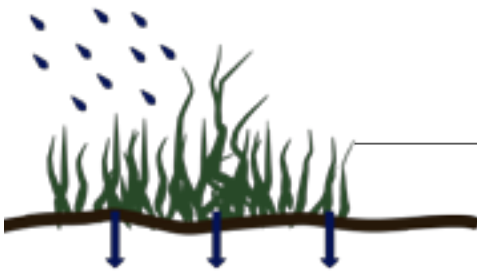
Fig. 3.30
Perennial Meadow in Scampston, England,
Source: photo taken by Lesley Rigby



4.3.2 Transformation of impervious surface in pervious

Impervious surfaces cover a significant portion of the urban environment. Parking lots and heavily fertilized lawns are sources of stormwater runoff. They contribute to urban heat island effect and may cause flooding and water pollution.

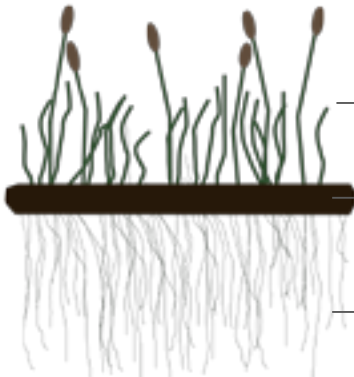
Reducing impervious surfaces is a sustainable site strategy to mitigate water pollution. Permeable pavements also known as pervious pavement allow water to flow in the paving material. Reducing impervious surfaces mitigates urban heat island effect and provide more favorable growing conditions for trees and plants. Increased water and access to oxygen and nutrients in the underlying soil. Vegetation, soils and diverse community of microorganism that live within the soils can break down - bioremediation, many pollutants. - natural cleaning mechanism (Venhaus, 2012).



Water infiltrates in to the ground instead of being immediately released with the pollutants in to the river

4.3.3. Water purification with floating meadows

Approach to treating water in river. Installed floating wetlands. These wetlands gain their flotation from numerous plastic bottles that were collected during the cleanup of site. The bottles were wrapped in fiber, then enclosed in a mesh. Native wetland plants and congress were planted. Their roots grow trough into the water, providing a measure of local water treatment and habitat for aquatic intertebrates and fish. Improve local water quality and provide further habitat (Beck, 2013)



Vegetation provides an aesthetic cover as well as habitat and food for a variety of wildlife including waterfowl, songbirds, turtles and frogs.

Multi- layer biomesh island matrix provides structural strength, huge surface for beneficial microbe colonization and rooting matrix for vegetation.

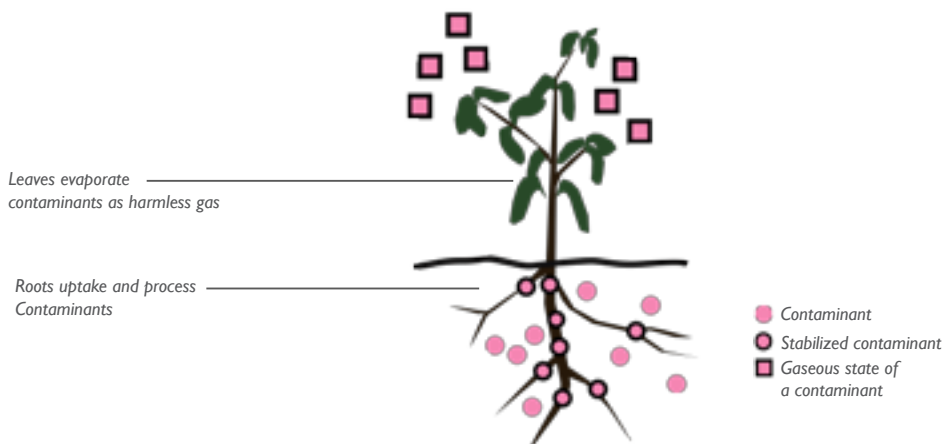
Roots uptake nutrients, provide cover and food for fish. Provide additional substrate for beneficial microbe colonization.

3.3.4 Phytoremediation

Phytoremediation is use of plants for cleaning pollutants from soil, water, sediments, and air. It is an energy efficient, esthetically pleasing method of remediating contaminated sites. Pollutants are taken up by the plants roots where they are chemically modified through the plant's metabolism and evaporated as harmless gas, or they are stored within the plant's biomass which can then be harvested and processed (Venhaus 2012).

Phytoremediation is actually a term for several ways in which plants can be used to clean up contaminated soils and water. Plants may break down or degrade organic pollutants, or remove and stabilize metal contaminants.

With the removal of harmful substances, we are able to benefit not only from cleaner air, water, soil but also prolonged habitat improvement, and the enhancement of diversity and vitality in urban and rural areas by integrating phytoremediation into public space. (<http://en.wikipedia.org/wiki/Phytoremediation>, http://www.asla.org/sustainablelandscapes/Vid_Brownfields.html)



Reference

Pier 53, Philadelphia

Philadelphia Biohabitats have created a broad ecosystem services in their plan for Pier 53. The main objective of the revitalization of the pier is to create public water front access, improve ecological health of the River along with recreational, aesthetic and spiritual benefits. They offers a wide range of tenable ecosystem services: water quality improvement, soil regeneration, habitat creation. The result is transformation of hard edged ecosystem in a living ecosystem.

Before its transformation in a public park the pier had been covered with concrete and asphalt. By using jackhammers and drilling equipment pieces of the pavement were removed in different patterns. The holes were filled with bioretention soils mix to and plated to create “dendritic decay gardens”

Approach to treating water in river: Installed floating wetlands. These wetlands gain their flotation from numerous plastic bottles that were collected during the cleanup of site. The bottles were wrapped in fiber, then enclosed in a mesh . Native wetland plants and congress were planted. Their roots grow trough into the water , providing a measure of local water treatment and habitat for aquatic invertebrates and fish. Improve local water quality and provide further habitat. (Beck 2013)



Source for pictures: www.planphilly.com [Accessed March 2014]





4. Lindenufer transformation

Design objectives and implementation of the strategy

Design highlights in the master plan

Sustainable parking lot transformation,
Increased biodiversity,
Link old city with water

Design objectives:

Appreciated water front, Historic city by the Water, Green Historic city, make a old city and the riverbank one whole
Attract visitors
Improve resident's wellbeing
Satisfy everyday needs of residents and visitor and constrains of happiness:
Improve ecology of the site.

Implementation of the Master plan strategy

1. Connect: Old city with water, create new values for the riverbank, make it part of the city- green city.
2. Activate: green areas provide social services, recover mental and physical health, stimulate human senses and enhance happiness
3. Restore biodiversity to increase ecological health of the urban area and along that restore physical and spiritual health of the people

Unappreciated waterfront. Why?

Brief historic overview of use and development

One of the measure problems is weak connectivity of the bank with the old city. The river bank is still felt to be outside of the old city, although the fortification wall was demolished long time ago.

The Lindenufer riverbank was the first green area on the edge of the old city. In 1855, after the demolition of the east fortification wall, it was as established for first time as a park, that corresponded to the needs of the residents at that time: promenade, a monument, borders of flowers along alleys. After the first world war the park was plainer constructed because of high maintenance costs.

Since the Lazarette was demolished there is parking lot and the rest of the area is in post-war style until today. The conditions for play, recreation and sport are insufficient.

The first plans for reconstruction of the Lindenufer riverbanks was made in 1987 with a suggestion for expanding the green area and construction of new alleys in the place of the parking lot, but the plans was not realized and Lindenufer has the same appearance until today.

Parking lot- main reason for the unattractive riverbanks

The removal of the parking lot is a necessary measurement to construct the Lindenufer as valuable park for recreation and attract residents and visitors to approach the riverbank from the old city. This measurement will increase also the well-being of the inhabitants, because currently the parking lot is a measure source of noise and pollution.

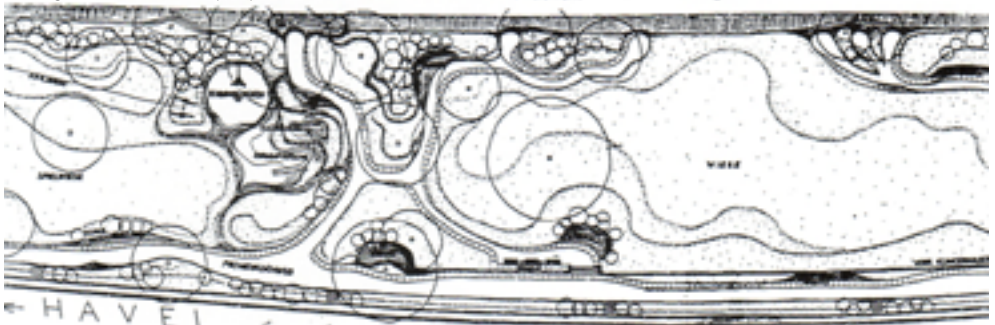
Fig. 4.1
Parking lot in 1988
Source: unknown



Fig. 4.2
Parking lot today expands on about 1/3 of the area of the Lindenufer.



Fig. 4.3
Plan for expanding the green area with a meadow in the place of the parking lot from 1987
Source: bgmr Landschaftsarchitekten (2013)



4. Lindenufer transformation

Peoples's wishes for Lindenufer

Discussion with inhabitants before starting urban planning project

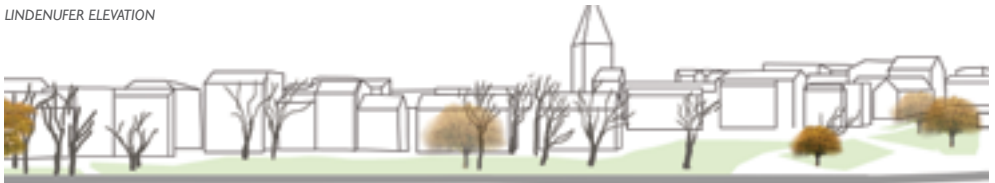
The Doctoral thesis "Evaluation of urban environments. A method to measure experience" (Steffner 2009) emphasizes on the significance of the discussion with inhabitants for evaluation of the strengths and weaknesses in the urban areas. Their estimation and experiences give valuable guidelines for how to develop an urban area. Therefore, it is very important for planners to pay larger attention to people's experiences in the urban environment. Their opinion can help for achieving an overall sustainable society.

Rights-based approach

In order to use rights-based approach in my suggestion for Lindenufer redevelopment, to be able to evaluate the current state of the riverbanks and consider people's needs I examined in detail a feasibility study for Lindenufer waterfront made in 2012 by the landscape architectural office "BGMRLandschaftsarchitekten". They had organized an information event on 29.11.2011 for inhabitants to introduce them in the transformation of the Lindenufer and invited them to give suggestions. The social participation in the feasibility study of Lindenufer gave important guidance for the further work of the planners.

Therefore, in my design proposal I tried to include as much as possible peoples' wishes for the transformation. A summary of the most relevant points to my design vision for the Masterplan for the riverbanks is listed in the following text. My intention was to address these in the design proposal for Lindenufer

LINDENUFER ELEVATION



Peoples' wishes for Lindenufer

The questionnaire given to the inhabitants was on the basis of five topics: Leisure + natural, historic, social, mobility and security. The following questions were discussed:

- What's wrong with Lindenufer? What should be maintained?
- How the old city can benefit from the waterfront?
- What kind of creative use is conceivable?
- What would make Lindenufer for you?

The answers are ordered in the different categories.

Leisure and nature

- Bike racks
- Playground renovation
- Recreation spot and meeting point for all
- Benches with views to the water

Historic city

- Access old town water
- Tourism
- Lindenufer for all ages
- Brighter illumination
- Nightlife

Social

- Initiatives for young people
- Benches for seniors as meeting point
- Multifunctional area for events
- Parking lot- mixed use

Mobility

- Bike racks under Juliusturm bridge
- Bike lane between Charlotten bridge und Juliusturm bridge directly by the water
- Connect bike lane with Spandau's bike routes
- Cycle/pedestrian promenade with minimum width of 5 m.
- Remove parking lot
- Service point, info-point for cyclists
- Bike tourism

Security

- Illumination under bridges
- Brighter illumination

4. Lindenufer transformation

Exiting site conditions



The figure on the right show the exiting site conditions on Lindenufer riverbank and what should be changed in order to consider the sustainable vision and the design objectives of the Masterplan. The transformation suggested in the design proposal in this chapter implements the strategy for the riverbanks in the master plan (See p. 61). The following implementation guidelines are considered:

1. Connect
2. Activate
3. Restore ecosystem functions

Alleys and promenade (fig. 4.4)

The promenade is too narrow to serve for both bike and pedestrian transportation. There are no attractive places, where pedestrian can stop, enjoy water and recreate. The alleys are weak connection to the old city. They fragment the waterfront, which beaks its integrity. It is a landscape without legibility, that does not provide place for walking and recreation.

Parking lot

Measure source of noise and pollution, cuts of the green area entity, takes up 1,3 of the riverbank.

Jewish monument (fig. 4.5)

The Jewish monument was reconstructed in 2004 and it is preserved in the design proposal.

Vegetation

Vast lawns have low esthetical impact and indicate poor biodiversity. Trees are generally in good condition and are preserved in the design proposal

Playground (fig. 4.6)

Playground area is marked with yellow. It is spread in different spots and on site it is not clear, where play and recreation take place. The playground is currently under construction for renovation because of its bad condition.

Lindenuferstraße

Bikes are currently allowed only on the street.

Fig. 4.4 Promenade



Fig. 4.5 Jewish monument



Fig. 4.6 Playground currently under construction



4. Lindenufer transformation

Siteplan



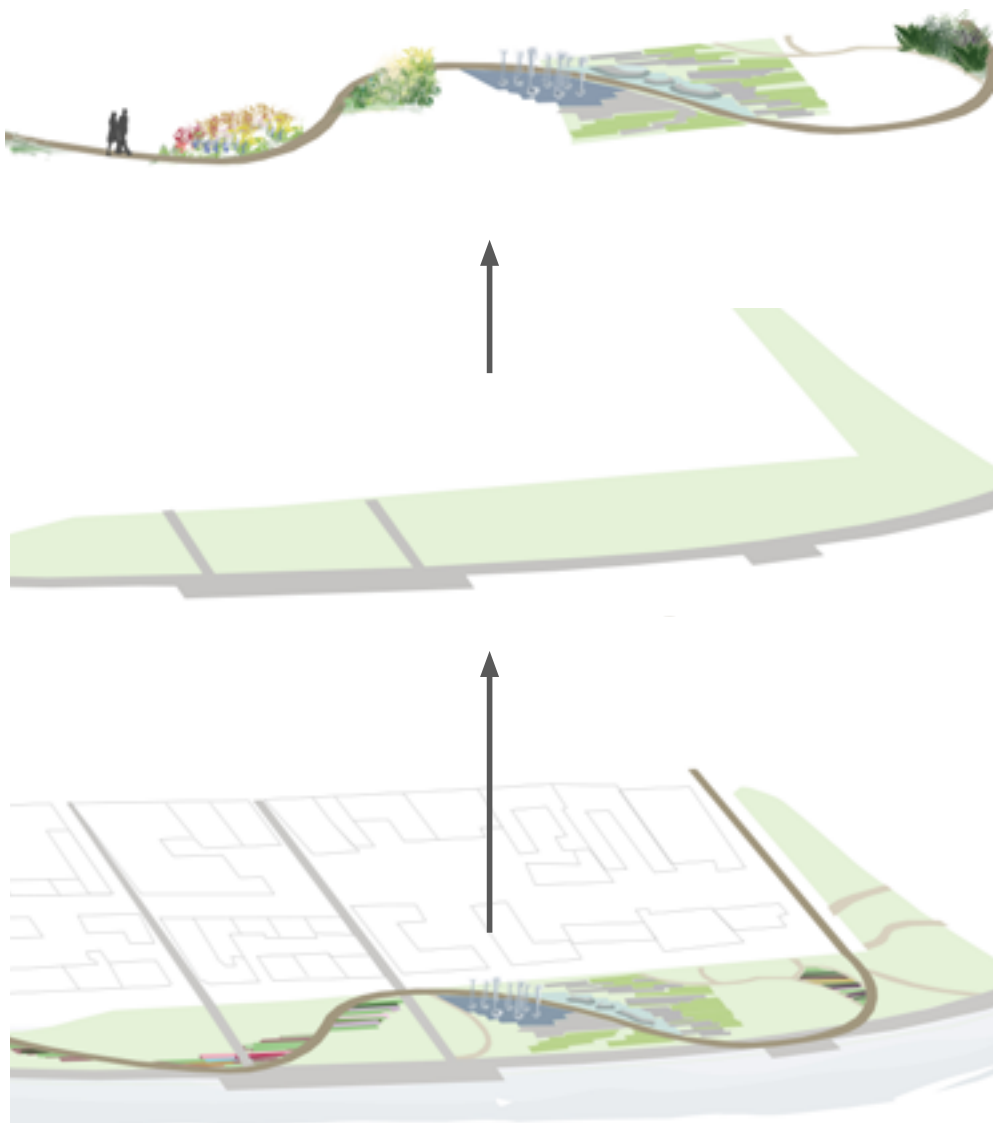


LEGEND

- 1 Alleys linking the water front with Old city
 - 1a Stairs and wooden deck over Havel
 - 1b Balcony- rest stop for cyclists and fishing spot
- 2 'Walk your senses' path
 - 2a Blooming colors garden
 - 2b Aromatic garden
 - 2c Tactile garden
- 3 Parking lot transformation 'Play with water, air and plants'
 - 3a Fountain
 - 3b Artificial topography for jumping and climbing
 - 3c Wild and native plants
- 4 'Promenade of Light and shadows'/ Circular walk
- 5 Public square, Munitions factory
- 6 Forestry park and lawn for sun bathing

4. Lindenufer transformation

Design highlights of the transformation



Walk your senses path

A stream- like alley, that cross the whole green space is projected as alternative to the transit connections, enables walking and enjoying the greenery. The promenade and the street of the old city are tan gated to the stream- like alley. The idea is that playground equipment and interesting vegetation compositions, lights and benches are arranged along this path to use the space, without cutting of the green area. In the points of the intersection with the promenade and the street there are the objects of highest interest to attract visitors attention. The stream- like shape gives the water front legibility and makes it memorable.



Historic city by the water

The redevelopment concept suggest direct connections with straight alleys as extensions of two of the streets in the old city which lead to the commercial street and the mark. The connections are perpendicular to the river promenade and by the intersection stairs and a balcony over the river are established to provide access to the water front, where one can sit, enjoy the view at the confluence and observe the passing ships. The connections Historic city- water, Historic city- promenade and Historic city- Circular walk are enabled as part of the Master plan.



LINDENUFER TRANSFORMATION

4. Lindenufer transformation

4.1. Historic city by water

Historic city– water connection

They are linked through 2 wooden decks over the water-. The first one is with stairs, enables recreation closer to the water and a view to the confluence, which is activated in the Master plan proposal. A visual connection is established (See fig.). A second wooden deck is designed closer to Juliusturm bridge. It is a balcony over the river and serves as a recreational spot and look out for passengers and cyclists.

Historic city– Promenade/Circular walk connection

The promenade is designed for both walking and biking. It connects Lindenufer with the Berlin's green ways and all main biking routes in Spandau.

The three sections below illustrate the interventions proposed for the reconstruction of the promenade compared to the existing situation.

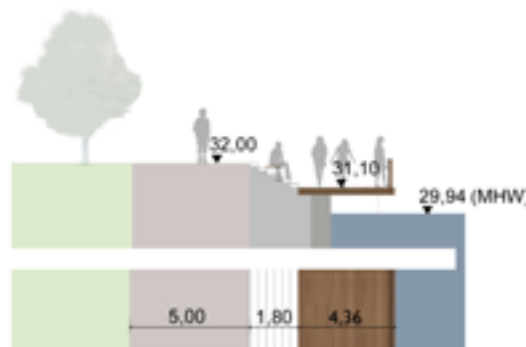
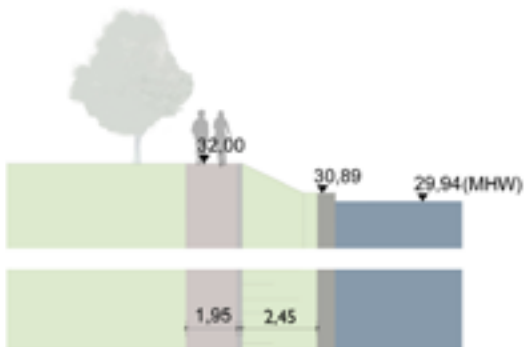
STAIRS AND WOODEN DECK



Scale 1:200

Existing

Proposed

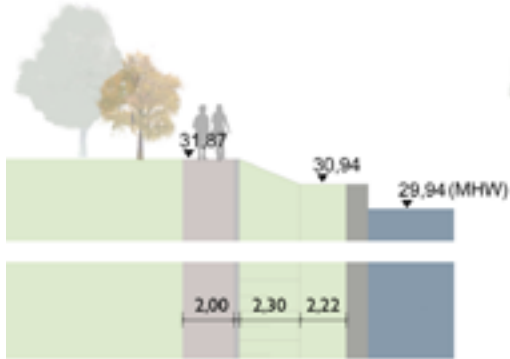


PROMENADE

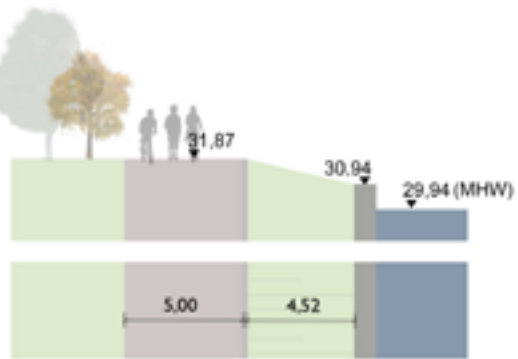


Scale 1:200

Existing



Proposed

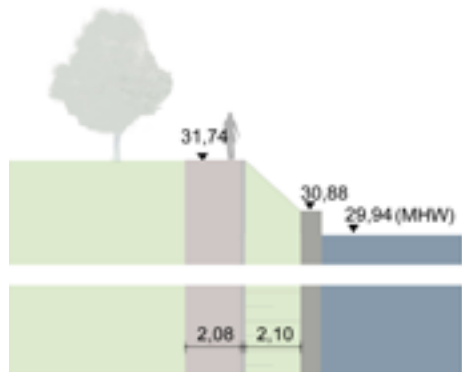


BALCONY

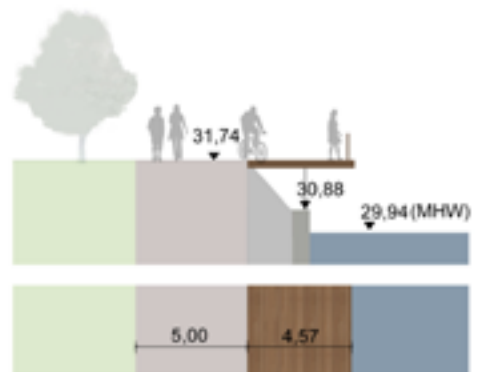


Scale 1:200

Existing



Proposed



4. 2. Walk your senses path

‘Walk your senses’ path

A curved path streaming through the whole green space of Lindenufer is designed to unite the greenery and create a sense of entity. It is an inviting vegetated path, which rises as an extension of the street, tangents Lindenuferstrasse and the Promenade, and ends at Lindenuferstrasse to provide barrier-free access to the Charlotten bridge. Plants with different characteristics are selected for gardens along the path to create an element of surprise and interest by enhancing the sensory experiences of the person walking by.

Parking lot transformation “Play with water, air and plants”

The path crosses the former parking lot, which is transformed into a flexible green place for play and recreation. The transformation encourages interaction with nature. It aims at increasing the biodiversity in the green space, which gives the waterfront a new identity and increases inhabitants' wellbeing.

WATER



PLANTS



AIR



SECTION F-F ‘WALK YOUR SENSES PATH’

0 5 10 20m



Plants palette "Touch, smell, see"

Plants add ecological and aesthetic value to the landscape and maintain ecosystem function by providing biodiversity conservation. The mentioned gardens along the path simulate the human senses with a selection of plants palette of diverse perennial grasses, flowers and herbs.

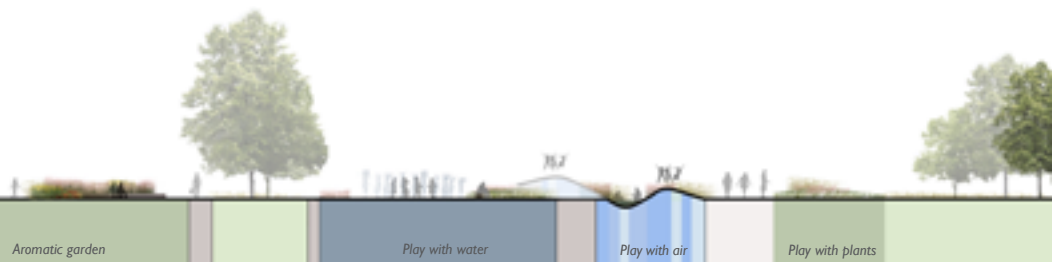
SEE



SMELL



TOUCH



4.3. Parking lot transformation “Play with water, air and plants”

Fig. 4.7

Dendritic decay gardens

Source: <http://planphilly.com/articles/2010/10/27/welcome-washington-avenue-green>

[Accessed March 2014]



Fig. 4.8



Method for transformation of the parking lot

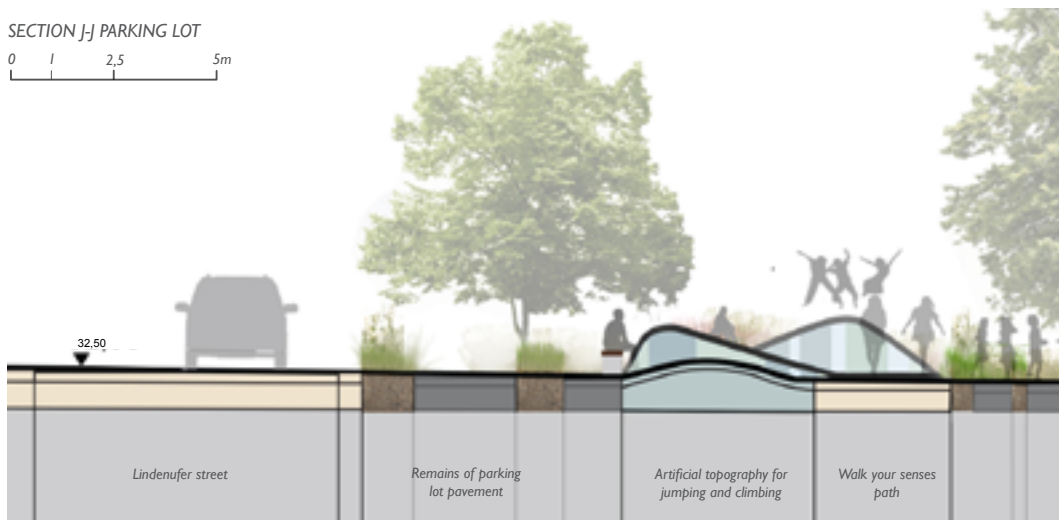
Due to a high cost for greening the whole parking lot a possible solution is to create a 'dendritic decay garden' as sustainable method for accelerating the natural breakup and decay of the pavement and transform the impermeable surface into a permeable. The ecological health of the site will increase with on site stormwater management that allows water to sink in the ground than being immediately released with the pollutants in to the river. (Becks, 2013).

Fig. 4.9 Parking lot



SECTION J-J PARKING LOT

0 1 2,5 5m



4.3. Parking lot transformation “Play with water, air and plants”

Fig. 4.10 Flexible space for play and recreation

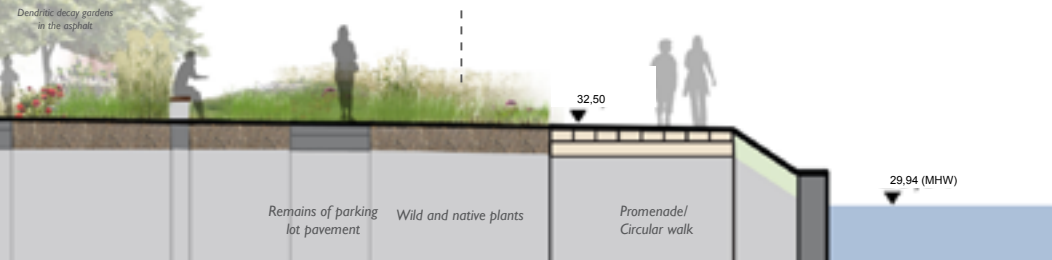


IMPROVED STORMWATER MANAGEMENT

The parking lot is transformed through 'dendritic decay gardens'. The asphalt is drilled in patterns. The resulted holes are filled with structural soils and vegetation. This is a sustainable method for accelerating the natural breakup and decay of the pavement and transform the impermeable surface into a permeable. The ecological health of the site increases with on site stormwater management that allows water to sink in the ground than being immediately released with the pollutants in to the river.



Dendritic decay gardens
in the asphalt



4.3. Parking lot transformation “Play with water, air and plants”

Play with air: the material

Artificial topography is made of recycled rubber layers varying in thickness and consequently in resilience. The rubber produces a gradient of elasticity and bounce and has thickness along its section that corresponds to the topography. By its creates the artificial topography is called "liquid topography", because of the surprising effect its produces when one run in to it. The material has a great elasticity, therefore the feeling when wan runs into it can be described as jumping on a mattress. Kids can bounce, and climb the hills. The peaks are filled with Porous "rubber mulch" to allow water drainage. (Robinson and Margolis, 2007)

Fig. 4.11 Detail "Liquid topography"
Source: Robinson and Margolis, 2007

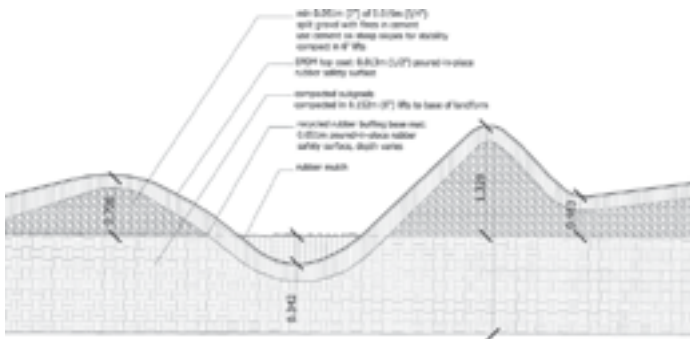


Fig. 4.12 Safe zone playground by Stoss
Source: Robinson and Margolis, 2007

Fig. 4.13 Safe zone playground by Stoss
Source: Robinson and Margolis, 2007



4.3. Parking lot transformation “Play with water, air and plants”

Play with plants

Play is more imaginative and creative in natural environments and has development benefits for children. The regular contact with nature enhances concentration, self discipline, develop imagination.

In addition, the play with plant is pedagogical. It provides knowledge about native plants and how to grow them.

Play with water

Play with water is as beneficial for children's development as play with plants. Water offers endless enjoyment for children of all ages and adults. Play with water is a connection with natural material and provide sensory experiences. Moreover, the children are free to design their play and interact with each other.

Fig. 4.14

Gubei Pedestrian Promenade by SWA Group

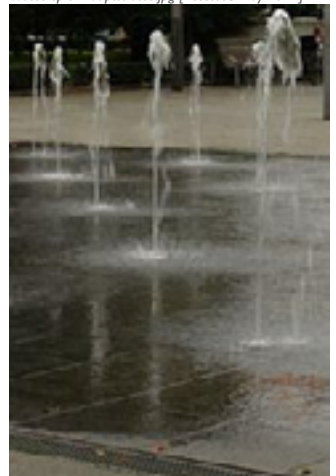
Source: <http://www.landezine.com/index.php/2011/04/gubei-pedestrian-promenade-by-swa-group/>
[Accessed May 2014]



Fig. 4.9

Wasserspiel, Dresden

Source: <http://commons.wikimedia.org/wiki/File:Dresden-Wasserspiel-Hauptstrasse.jpg> [Accessed May 2014]



4.4. Plants palette

Design criteria for the plants palette

- Aesthetic: landscape should be visually engaging all year round
- Economic: species for low- input management
- Ecological: species, which offer food and shelter for butterflies and birds.
(Hunter, 2011)

TEXTURE Source for plants' images: www.gartendatenbank.de [Accessed May 2014]



FRAGRANCE



Right plants' qualities

When choosing the right species the plants in the palette should have the following qualities:

- Plasticity (to be tolerant to a wide range of environmental conditions)
- Resilience: the ability to maintain functions in case of environmental disturbance.
- Structural diversity (special complexity in the plants collection and diversity of species. Diversity has high importance for healthy ecosystems. (Hunter, 2011))

WILD AND NATIVE



BLOOMING COLORS



4.4. Plants palette

Blooming colors garden

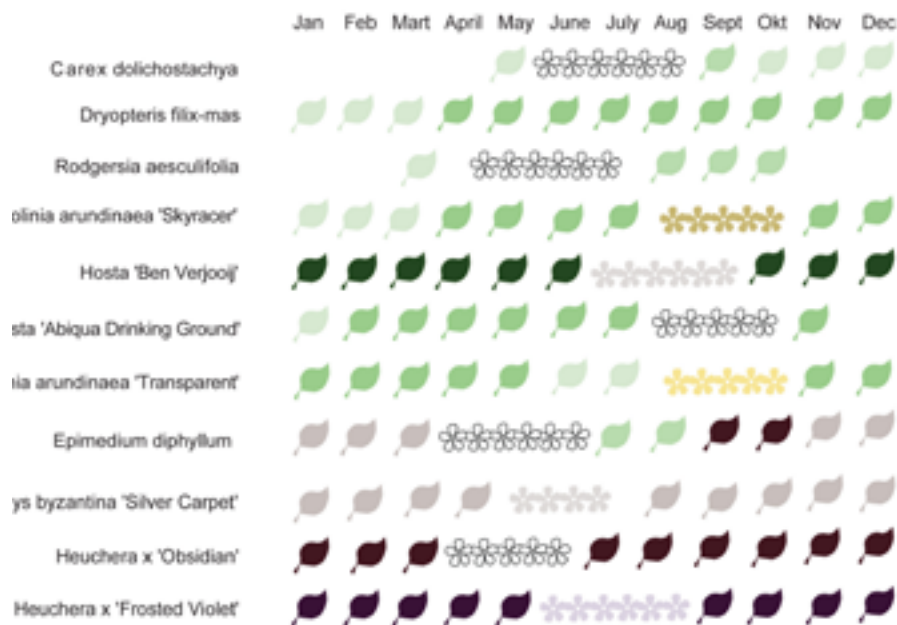
Flowers in bloom bring always joyfulness, because they make the green areas more lively and beautiful. In this case I made use of contrast by grouping together plants of different shapes, sizes and colours. Along with the esthetic benefits the garden offers food and habitats for butterflies, bees and birds with its long periods of flowering in every season.





Tactile garden

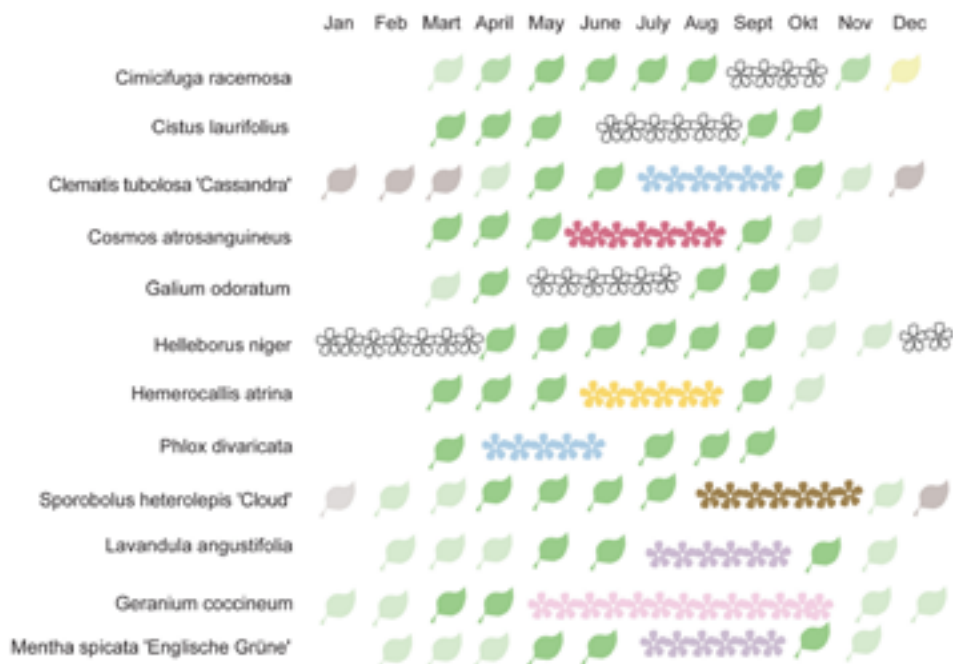
This garden is full of delightful plants to touch and feel. The plants used have different textures such as large fleshy leaves , velvety- furry leaves, as well as feathery ferns.



4.4. Plants palette

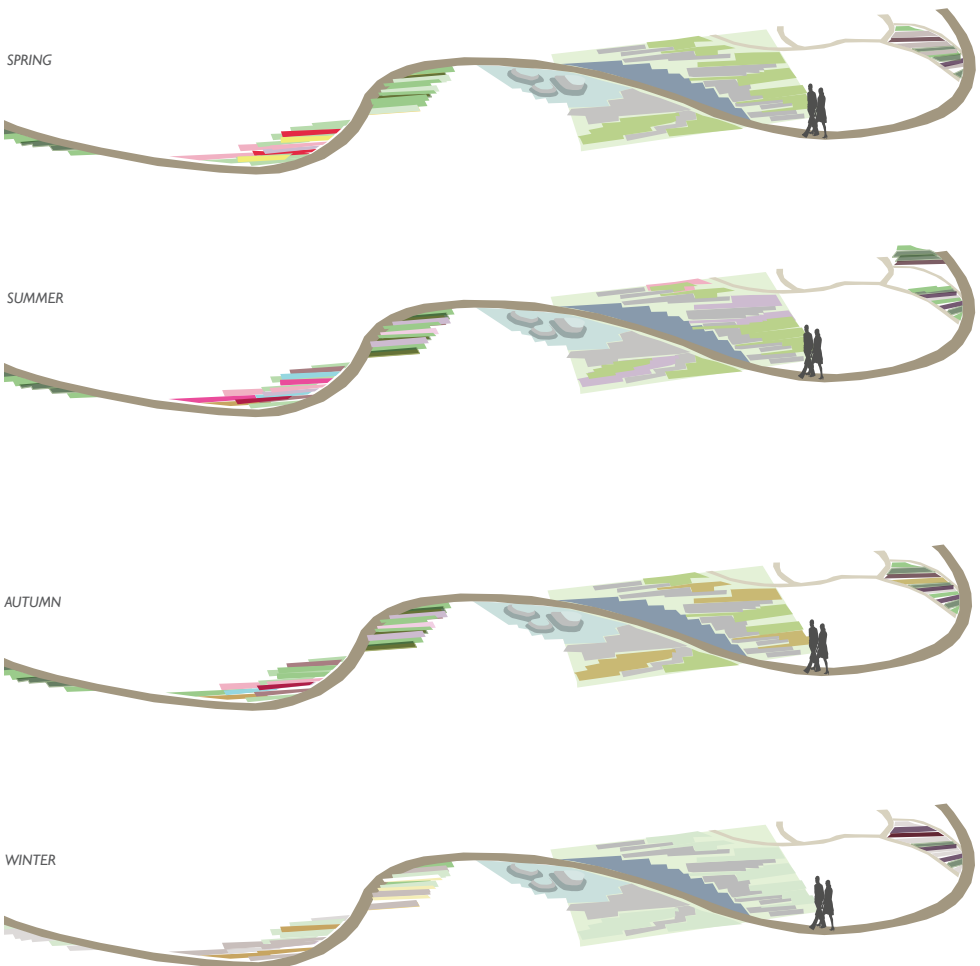
Aromatic garden

The aromatic garden offers opportunities to enhance the sense of smell, to recall memories and to affect mood with more than 10 plants with different fragrances (see *table below*). Unlike the other sense organs, the nose sends information directly to part of the brain concerned with memory and emotion. The plants chosen have also aroma therapeutic benefits. For example the lavender and the wild blue phlox have calming effect, while the chocolate cosmos has energizing effect.



Seasonal dynamic of the plants palette

The schemes below show how the colors of the gardens change with the different seasons. The plans communities are design to have long live cycles for durable esthetic effect with flowering and changing leaf colors. Some of the plants are evergreen perennials so that the gardens do not disappear in the winter.



Learning outcomes

This is my second Master thesis, but the experience and the learning outcomes are very different from my Master's thesis in Landscape architecture. I made more research and analysis than in the first time and I also extended my design skills in 3D visualizations by making a digital model. As a whole I consider the knowledge I obtained as very beneficial. It gives me confidence as a professional and I believe it will give me a good start in the carrier life.

Research

New for me was theoretical approach to the design project and the focus on sustainability in landscape architecture.

Seeking for answers of the research questions was very interesting, but also challenging. On one hand the research was exiting and enriching, on the other I had to dive in a fields beyond my academic knowledge and experience. My biggest challenge was to understand the science of Landscape ecology. I put much efforts to comprehend its principles, because I realized its significance for designing a sustainable landscape. Although my background limits me in applying them, I am content with the way I manage to reduce the finding to essentials, so that my project can benefit from them. The rest of the theoretical study was demanding as well. The Historic Urban Landscape Approach to sustainability and the Place and Space concept I explored made me observe the sustainable landscape from different perspectives. Sometimes I felt confused how to relate the different parts of the research to the project, because of the different charters of the three study fields. As much as the approach of Landscape ecology to sustainability is precise and scientific, based on measurements and results, as socially and culturally orientated are the Historic Urban Landscape approach and the Place and Space concepts sustainability. In spite of this, I think that I managed to find what all these theories have in common and to link them with the project.

I find out that the three study fields are concerned with human wellbeing and with this conclusion I also found the answer of my main research question "What does sustainable landscape mean?". The complementary research question: How to create a sustainable landscape? How to analyze and understand the issues of the urban landscape? Which are the principle for sustainable landscape planning and design? and How to redevelop the riverbanks? I tried to answer with the analytical frameworks. I think that this a very strong idea in my MT, because it helped me link theory with design and create a story line.

The three analytical frameworks are good summery of the theories. In the same time they show how I analyzed and how I approached the design phase. Therefore I think that this MT succeeded with its methodology. Moreover, the methodology could be further developed in future and applied for approaching a wide range of landscape and urban planning projects.

I am generally content with the result of the theoretical phase of the MT , as well as with the analysis and the way I set up a start for the design phase with a SWOT. However, there are some imperfections deriving from the time frame for completing the thesis and my ambition to include different perspectives to sustainability. The report might look messy at a first glance, because of the broad theoretical overview, but once the reader grasps the methodology, it is easier to follow and understand the thesis.

Design

For the design part of the thesis I think I managed to make a very broad and rich design proposals. I tried to apply sustainability in different scale and to show it in plans, sections and renders. It was really engaging project because of the interesting situation: historic landscape and the industry on the other side. I had a lot of ideas and thought over and over my design proposal. I spent a lot of time on the circular walk until I found a solution I am content with. I sketched different scenarios for the bridge over the river Spree. I changed its location many times and I also changed its design. My initial idea was to concentrate on this bridge and make detailed proposal. But this plan changed in the work flow, because I didn't feel very confident that I would have had the time to make a proper research on case studies for bridges and explore how to design a sustainable bridge. This could have been a very interesting focus of the MT, especially if worked in a collaboration with a student with engineering or architectural background. Instead of that I focused rather on the master plan as whole picture and then I work more in-depth with Lindenufer riverbank.

Through designing I also enhanced my graphic visualization skills and I learned how to make digital model of urban environment, how to render with Vray. What is lacking in both master plan proposal and Lindenufer transformation is the work with the materials. I would like to complement that, when I further elaborate this project for my portfolio.

Conclusion

Working alone on this MT made me learn a lot not only for sustainability and landscape architecture, but also for myself. I found my strengths and weakness. I think I learned from my mistakes what I need to change in my working style and how to approach a project more effectively. Therefore I would definitely recommend independent work on a master thesis. However, this had also its drawbacks. Maybe in a collaboration the gaps in the MT would have been filled and the design proposal would have been better elaborated, because the topic and project area offer a wide range of design opportunities.

Books and academic articles

- Antrop, M. (2006) *"Sustainable landscapes: contradiction, fiction or utopia?"* 2005 Elsevier B.V.
- Architekten- und Ingenieur-Verein zu Berlin e.V.(2013), „Auslobung. Spandau bei Berlin. AIV Schinkel-Wettbewerb 2014.“Berlin. www.aiv-berlin.de
- Beck, T. (2013) *"Principles of Ecological Landscape design."* Washington, DC: Island Press
- bgmr Landschaftsarchitekten (2013) „Das Neue Lindenufer zwischen Charlottenbrücke und Am Juliusturm Aktionsraum plus Spandau-Mitte“
- BS für Stadtentwicklung (2004) „Planwerk Westraum Berlin. Ziele, Strategien und landschaftsplanerisches Leitbild“
- Council of Europe(2000) *European Landscape Convention*
- Council of Europe(2006)*Landscape and sustainable development: challenges of the European Landscape Convention*
- Cullen, G. (1971) *Townscape*. The Architectural Press 1961.
- Forman, R.T.T. (1995) *"Land Mosaics: The Ecology of Landscapes and Regions"* Cambridge University Press, Cambridge, UK.
- Grahn, P and Stigsdotter, U.K.(2010)“The relation between perceived sensory dimensions of urban green space and stress restoration. *Landscape and Urban Planning*” 94, 264–275
- Hunter, M. (2011) *"Emerging landscapes. Using ecological theory to Guide urban planting design: an adaptation strategy for climate change."* *Landscape Journal* 30:2–11
- Jianguo Wu, Chunyang He, Ganlin Huang and Deyong Yu (2013) *"Urban Landscape Ecology: Past, Present, and Future. Landscape ecology for sustainable environment and future."* Dordrecht: Springer
- Luisenstadt Kreuzberg (2012) *"Integriertes Stadtteil Entwicklungskonzept für den Aktionsraum plus Spandau-Mitte Fortschreibung 2012"*
- Lynch, K. (1960) *"The image of the city"*
- Lyndon, Donlyn (2011) *"Caring About Places, Places Journal"* www.places-journal.org
- Marc Antrop (2005) *"Landscape and Urban Planning 75"* 2006 187–197
- Millennium Ecosystem Assessment(2005) *"Ecosystems and Human Well-being: Health Synthesis."* Washington, DC: Island Press.
- Newton, J.(2007) *"Wellbeing and the Natural Environment: A brief overview of the evidence"*. University of Bath
- Norberg-Schulz, C. (1980) *"Genius Loci - Towards a Phenomenology of architecture."* New York: Rizzoli
- Robinson, A., Margolis, L. (2007) *"Living Systems. Innovative materials and technologies for landscape architecture."* Birkhäuser, Berlin

Salman, P. (2008) "What do we mean by sustainable landscape?" Sustainability: Science, Practice, & Policy. Fall/Winter 2008" Vol.4. Issue 2

Senatsverwaltung für Stadtentwicklung (2010) *Integriertes Stadtteilentwicklungskonzept für den Aktionsraum plus Spandau Mitte*

UNESCO (1972) "Convention Concerning the Protection of the World Cultural and Natural Heritage"

UNESCO (2005) "Vienna Memorandum on World Heritage and Contemporary Architecture - Managing the Historic Urban Landscape"

UNESCO (2010) "World Heritage. Managing Historic Cities."

UNESCO (2011) "New life for historic cities: The historic urban landscape approach explained"

UNESCO (2012) "Recommendation on the Historic Urban Landscape"

United Nations World Commission on Environment and Development (WCED) (1987) "Our Common Future"

Venhaus, H. (2012) *Designing the Sustainable Site*

Wu, J. (2006) "Cross-disciplinary, landscape ecology, and sustainability science" *Landscape Ecology*

World Commission on Environment and Development (1987) "Our Common Future"

Digital resources

Prelovsek, M. (2010) "Motorway Bridges on Island Fyn/Denmark by ÅFH", Available at: <http://www.enlightermagazine.com/projects/motorway-bridges-island-fyndenmark> [Accessed March 2014]

Senate Department for Urban Development and the Environment, *Environmental atlas Berlin*, Available at: http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml [Accessed February 2014]

Senate Department for Urban Development and the Environment, *Geoportal Berlin*, Available at: http://fbinter.stadt-berlin.de/fb/index.jsp?Szenario=fb_en [Accessed February 2014]

Senate Department for Urban Development and the Environment, *Land Use Planning Berlin*, Available at: http://www.stadtentwicklung.berlin.de/planen/fnp/index_en.shtml [Accessed December 2013]

Senate Department for Urban Development and the Environment, *Landscape planning*, Available at: http://www.stadtentwicklung.berlin.de/umwelt/berlin_move/en/hauptwege/index.shtml [Accessed December 2013]

Wikipedia, *Definitions on p. 29, 30, Phytoremediation*, Available at: <http://en.wikipedia.org> [Accessed March 2014]

Figures and images

Georgieva A. (2014) *All images and figures those are not taken from extrenal source, "Riverbanks redevelopment though sustainable landscape principles.A proposal for the banks of the Havel river in Berlin, Germany"*

AIV-Berlin (2014), Available at: <http://www.aiv-berlin.de> [Accessed January 2014], Fig.2, Fig.5

Newton (2007), Fig. 1.1

www.journaldub.blogspot.se [Accessed February 2014], Fig 1.2, 1.3

Wu, Chunyang He, Ganlin Huang and Deyong Yu (2013), Fig. 1.4

Millennium Ecosystem Assessment (2005), Fig 1.5

Senatsverwaltung für Stadtentwicklung (2010) Fig. 1.7- 1.9, 2.4

Senate Department for Urban Development and the Environment, Available at: http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml [Accessed February 2014], Fig. 1.10- 1.11

Prelovsek, M. (2010) Available at: <http://www.enlightermagazine.com/projects/motorway-bridges-island-fyndenmark>, [Accessed March 2014], Fig 3.11, 3.12

www.firmenverzeichnis-spandau.de, [Accessed March 2014], Fig 3.22

<http://www.landschaftspark.de/der-park> [Accessed May 2014], Fig. 3.25- 3.27

<http://planphilly.com/articles/2010/10/27/welcome-washington-avenue-green> [Accessed March 2014], Images on p.68, Fig. 4.7, 4.8

bgmr Landschaftsarchitekten (2013), Fig. 4.3

Robinson and Margolis, 2007, Fig. 4.11-4.13

<http://www.landezine.com/index.php/2011/04/gubei-pedestrian-promenade-by-swa-group/> [Accessed May 2014], Fig. 4.14

<http://commons.wikimedia.org/wiki/File:Dresden-Wasserspiel-Hauptstrasse.jpg> [Accessed May 2014], Fig 4.15

www.gartendatenbank.de [Accessed May 2014], Images on p. 89, p.90

<http://greenthumbs.cedwvu.org/factsheets/sensory-design.php> [Accessed May 2014], Image p.83

<http://2il.org/mimosa-pudica-or-sensitive-plant/> [Accessed May 2014], Image p.84

<http://jumpintheair.com/three-girls-jump-in-the-air-in-a-grassy-field-with-bright-blue-sky/12/> [Accessed May 2014], Image p.84

<http://andybethmck.blogspot.se/2010/11/first-fountain-play.html> [Accessed May 2014], Image p.83

Teil B
V Aufgabenstellung
V.5 Landschaftsarchitektur (LA) - Teilaufgabe

AIV
Schinkel-Wettbewerb
2014

Ulrike Böhm

„Ufer Räume und Rundweg entlang von Havel
und Spreemündung“

Einleitung

Havelufer und Spreemündung der Spandauer Altstadt sind geprägt durch ein Patchwork aus unterschiedlichen Fragmenten: Parkanlagen, Wohngebäude verschiedener Entstehungszeiten, eine historische Munitionsfabrik, gestaltete und umgestaltete Uferzonen und Gewerbegebiete. Die derzeit nur teilweise zugänglichen Uferbereiche entlang von Havel und Spree sollen zu einer eigenständigen und prägnanten Freiraumsequenz weiterentwickelt werden. Dazu sind übergeordnete, aus dem Kontext abgeleitete Gestaltungsideen zu finden: Für die einzelnen Uferbereiche sind – jeweils ausgehend vom sehr heterogenen Bestand – Ideen für den Freiraum zu entwerfen, die wesentliche räumliche Qualitäten aufgreifen, akzentuieren und gleichzeitig bestehende sowie geplante Freiraumnutzungen ordnen. Dabei sind die besondere Beziehung zur Flusslandschaft und eine bessere Erlebbarkeit sowie Zugänglichkeit zum Wasser zu beachten.

Ein weiterer Schwerpunkt der Aufgabe liegt in der Konzeption eines Rundweges entlang der beiden Uferseiten, der dieses Patchwork neuer und bestehender Räume zu einer neuen Sequenz verbindet. Es ist eine durchgängige, möglichst barrierefreie Erschließung für Radfahrer und Fußgänger zu entwickeln, die den Uferverlauf sowie besondere Stationen spannungsvoll inszeniert und gleichzeitig die Kontaktaufnahme zum Wasser ermöglicht. Bei Hindernissen wie Brücken und privaten Uferzonen sind Vorschläge für die Durchgängigkeit zu machen. Die bestehenden Sicht- und Wegebeziehungen zwischen den an Havel bzw. Spree angrenzenden Quartieren sind zu analysieren, zu akzentuieren und in die Gestaltung des Rundwegs bzw. der Freiräume zu integrieren. Einzubeziehen in den Rundweg sind dabei die Zitadelle sowie eine neue Fußgängerbrücke über die Spree.

Eine Kooperation mit Teilnehmern der Fachsparte Konstruktiver Ingenieurbau, die eine Konzeption dieser Brücke entwickeln, bzw. mit den Teilnehmern der Fachsparte Städtebau ist möglich und zu empfehlen (siehe unten bzw. entsprechende Aufgabenstellungen).

Aufgabe

Altstadtufer

Der Uferbereich auf der Altstadtseite ist geprägt durch eine Abfolge gestalteter Freiräume aus unterschiedlichen Zeiten bzw. durch Stellplatzanlagen. Hier ist, ausgehend von einer erlebbaren räumlichen Sequenz entlang des Rundwegs, eine übergeordnete Gestaltungsidee für den Uferpark zu formulieren. Dabei sind die Sicht- und Wegebeziehung aus der Altstadt zur Havel sowie die Zugänglichkeit zum Wasser zu verbessern.

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Weiterhin ist eine Lösung zur Aufwertung der Anschlussbereiche Richtung Bahnhof am Bahnviadukt zu finden: Neben einer Verbesserung des Durchgangs durch die Eisenbahnbrücke sind Vorschläge für eine größere Durchlässigkeit und Belebung des Viadukts für eine stärkere Verknüpfung der beiden Stadtbereiche zu entwickeln. Zu prüfen ist ebenfalls eine bauliche Arrondierung anstelle des Parkhauses am Stabholzgarten sowie im Bereich des ehemaligen Postamtes 20, südlich des Viadukts.

Am Kolk/Zitadelle

Im Norden, am Übergang zum Bereich Am Kolk, kann der Parkplatz am Lindenufer entfallen. Hier ist eine Wegeverbindung entlang des Ufers zu finden, ebenso wie ein Standort für eine Querung der Spree Richtung Zitadelle. Dies kann durch eine zusätzliche, für den Kontext angemessene Fußgängerbrücke erfolgen oder durch eine Querung im Zusammenhang mit den Bauwerken an der Schleuse. Die Zitadelle ist in den Rundweg einzubinden. Ein Anschluß des Weges in Richtung Süden ist durch eine neu zu positionierende Fußgängerbrücke über die Spree zu formulieren, die in Verlängerung der Stichstraße südlich an der Straße Am JuliuSturm anschließen kann und über die Spreeinsel und den Ruhlebener Altmarm bis Stresow führt.

Östliches Havelufer

Auch für das östliche Havelufer – zwischen den Brücken Am JuliuSturm und Ruhlebener Straße – sind eine durchgängige Erschließung als Teil des Rundwegs sowie übergeordnete, aus dem jeweiligen Kontext abgeleitete Gestaltungsideen für den Freiraum zu entwickeln.

Dabei ist zu beachten, dass im Zuge einer baulichen Veränderung zur besseren Schiffbarkeit die Verbreiterung der Spreemündung geplant ist. Der dazu anstehende Umbau des nord-östlichen, gegenüber der Altstadt sehr exponiert liegenden Uferbereichs bietet die Möglichkeit zu dessen Akzentuierung und Neugestaltung. Dieser Bereich ist anzubinden an die neu zu planende Fußgängerbrücke über die Spree (s.o.), die den Anschluß zur Zitadelle nach Norden, wie auch nach Stresow im Süden ermöglicht. Lage und Form dieser Brücke sollten die landschaftsräumliche Bedeutung der Spreemündung möglichst wenig beeinträchtigen.

Stresow/Geschützgießerei/Plantage

Die Stresower Uferbereiche sind, ausgehend vom Anschluß der Fußgängerbrücke, entlang von Spree und Havel als Freiraumsequenz entlang des Rundwegs zu gestalten. Für Engstellen und Hindernisse, wie Brücken, private Uferzonen und Gewerbebereiche, sind entsprechende Vorschläge für die Durchgängigkeit zu entwickeln. Dies kann über bauliche Lösungen oder eingeschränkt auch durch Ankauf von privaten Grundstücken bzw. ein eingeräumtes Geh- und Fahrrecht erfolgen.

Die Freiräume rund um die ehemalige Geschützgießerei sind in die Freiraumsequenz zu integrieren und zu gestalten. Für das historische Gebäude und sein Umfeld sind geeignete Nutzungen sowie konzeptabhängig bauliche Verdichtungs-

Teil B

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möglichkeiten aufzuzeigen. Im Bereich des Quartiers um die Plantage ist die Einbindung und Aufwertung der vorhandenen Freiräume in die Sequenz des Rundwegs zu prüfen sowie der Anschluß des Wegs an die Brücke der Ruhlebener Straße. Zu gestalten sind der Abschluß bzw. Auftakt des Rundwegs sowie die Anknüpfung hin zur westlichen Uferseite, zum Gelände der Post 20 (s.o.). Ein Weiterführen des Uferwegs südlich der Ruhlebener Straße kann geprüft werden.

Städtebauliche Arrondierung

Die an das östliche Havelufer bzw. an beide Spreeufer angrenzenden Quartiere weisen verschiedene Möglichkeiten zur Nachverdichtung und Arrondierung auf. Dabei bieten die stadthistorischen und stadtmorphologischen Eigenarten jeweils unterschiedliche Anknüpfungspunkte für auf den Kontext bezogene Ergänzungen. Im Sinne einer räumlichen Klärung der Freiräume entlang des Ufers, aber auch innerhalb der Quartiere, können maßvolle bauliche Nachverdichtungen vorgeschlagen werden (siehe auch Aufgabenteil Städtebau).

Aufgrund der anspruchsvollen und vielschichtigen Problemlage empfiehlt sich eine fachübergreifende Kooperationen mit den Fachsparten Städtebau und konstruktiver Ingenieurbau. Die Wettbewerbsbeiträge dienen auch dazu, Anwohner und Bürger für das besondere Potenzial Spandaus zu sensibilisieren. Entsprechend sollten Darstellungen, Konzepte und Texte verständlich aufbereitet werden und neben Fachleuten auch Laien ansprechen.

Abgabeleistungen

- landschaftsarchitektonisches Gesamtkonzept M 1:1000, räumliche Darstellung aller Intervention im Wettbewerbsgebiet und in den Anschlussbereichen (Rundweg, Freiraumgestaltung, Bebauung, Vegetation)
- Herleitung und Begründung des Konzeptes als textliche Erläuterung
- Vertiefung M 1:500 zur Darstellung der wesentlichen räumlichen Entwurfsideen, Ausschnitt Mündungsbereich Spree mit beiden Uferseiten. Konzeptabhängig kann von diesem Ausschnitt abgewichen werden (maßstabsgerechte Detaillierung, kein Zoom vom M 1:1000)
- 2-3 Schnitte zu Uferprofilen mit Angaben zu Materialität und Pflanzenwahl, Maßstab und Lage sind konzeptabhängig zu wählen
- alternativ dazu: Detail zu Materialität und Pflanzenwahl, Maßstab und Ausschnitt sind konzeptabhängig zu wählen (maßstabsgerechte Detaillierung, kein Zoom vom M 1:500)
- mindestens eine perspektivische Darstellung

B. Analysis

B.1. Infrastructure

City and regional context

There is a railway station in the west part of Spandau, which is important for the whole city. Trains, S-Bahn and U-Bahn connect the city on local, regional and national level.

The administrative borough is regionally and nationally very well connected. Three main street cross Spandau over tree bridges over Havel.

Local situation

S-Bahn and U-Bahn connect Spandau directly with the city center. A dense network of Bus Stations connect the residential areas with each other and the historic city of Spandau.

Havel and Spree are amongst the most important waterways in Germany. There is relatively intensive shipping and cargo transportation. Several Boat Stops for tourist are situated along the riverbanks. (See Fig. 1.13)

Distance to city center- 15km
By S-Bahn/ U-Bahn- 35 to 60 min.
By car- 30 min

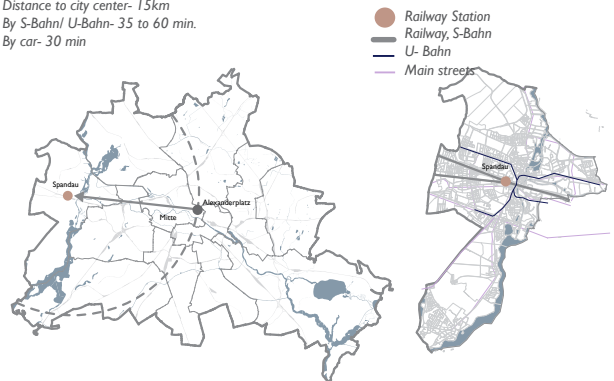


Fig. 1.13 Local infrastructure



Walking in the Historic city

Residents and tourist enjoy walking in the Historic city of Spandau. It is a compact district center providing a great variety of services. During the whole year the main commercial streets are vibrant. Car access is forbidden. (See Fig. 1.14, 1.16, 1.17)

Fig. 1.14

The old city is a lively pedestrian zone



Fig. 1.17

Even less popular streets in the historic city are closed for cars



Walking and Biking by the water

There is continuous promenade only on one west side of river. The riverbanks on the other side are only partially connected. Both sides of the river are connected by the bridges, which are accessible by stairs from the water front (see Fig. 1.15, 1.18, 1.19).

Fig. 1.15



Fig. 1.18

Charlotten bridge



Fig. 1.19

Dischinger bridge



B.2. Green infrastructure

City context

Spandau has attractive location on the estuary of Spree and Havel. Vast green areas in region make Spandau to one of the most green districts of Berlin.

20 Green Walks in Berlin®

Since 2004 '20 Green Walks in Berlin®' project has been developed. The '20 Green Walks in Berlin®' offer a wide range of walking and hiking and biking routes, daily routes or routes for longer excursions to explore the city and its landscape. Most of them are set away from road traffic. The objective of 'the 20 Green Walks in Berlin®' network is to link residential areas with the many diverse leisure amenities in parks and recreational areas in the city through green corridors (http://www.stadtentwicklung.berlin.de/umwelt/berlin_move/en/hauptwege/index.shtml).

BERLIN

Classification of green areas and network of '20 Green Walks in Berlin®'

20 Green Walks in Berlin®
Green areas
Forests
Water



Classification of green areas in Spandau. Location of important green scapes and five of the '20 Green Walks in Berlin®', which cross the district.

Regional context

Green walks in Spandau

1. Spree-weg/ Urstromtall
2. Spandauer Weg
20. Bullengraben Weg
12. Havelseeweg
11. Wannseeweg

Important public green spaces

- Koelzepark
- Spektegrünzug
- Wröhmännerpark



PROJECT AREA

Local classification of public and private green areas and activities



Green area around the Citadel



Local classification of public and private green areas and activities

- Playgrounds
- Sport
- Other activities
- Activities with restricted use

Private or unused green areas:

Small gardens, green areas in industrial zones

Public green areas, not actively used:

Stabholzgarten, Lindenufer, Stresow park, east river banks

Public green areas, actively used:

Citadel fortress, Bullengraben Grünzug, Müntziger Park, Wröhmännerpark

Local situation

From an overall perspective the green structure in Spandau is sufficient for recreation, playing and sport. Nevertheless, the green spaces in the project areas are not in a very good state. They are not linked together and some of them are inaccessible. They do not provide sufficient facilities for recreational activities. There are two playgrounds, but one of them on Lindenufer bank is in a very poor condition.

Lindenufer



Stresow park



Stabholzgarten



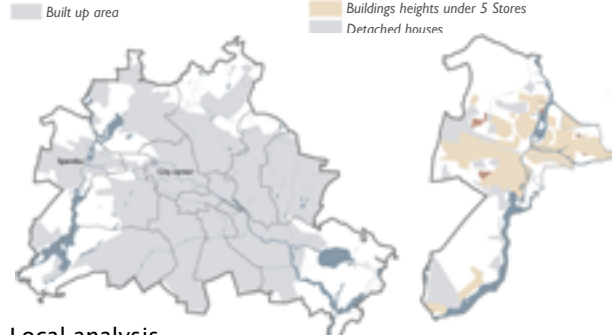
B.3. Built infrastructure

City and regional context

Compared to other Berlin boroughs overall, Spandau is one of the least built up.

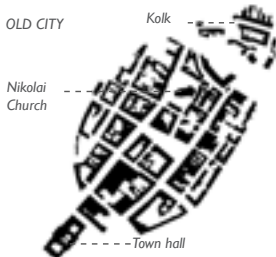
Built up area in the borough is presented predominantly with medium-height buildings, which are concentrated around the center. At the western edges and in south, there are mainly single family houses and small urban setting.

CITY AND REGIONAL CONTEXT

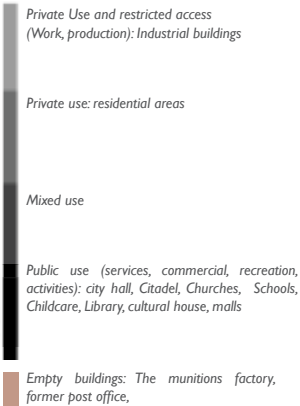


Local analysis

Characteristic for Spandau is its urban heterogeneity. The borough center is the Old city and all other neighborhoods are located around it. The following services are concentrated: retail, health care, administrations, and cultural institution: theater, library. Simultaneously, the old town is also a residential area. Industrial areas are located in immediate proximity on the other side of Havel river.



LEGEND



PROJECT AREA
Accessibility and Use of Building stock



Old city of Spandau

The Old city of Spandau has a grid plan dating from 13 Century. In 14 Century a city wall was build and the city was a fortification. In the 2nd World Spandau was almost completely destroyed. The city was rebuilt by preserving its medieval structure and some original buildings.

The city hall was built in 1911 as a symbol of the independence of the Spandau



Citadel Entrance



The Munitions Factory at the confluence

The old munitions fabric has a prominent location at the confluence of Spree and Havel. There are two factories. The larger and the is built 1871-1874 in the style of Berlin Schinkelschule. The second was built in 1914-15. During the division of Germany the buildings were used as grain storage for Senate reserves. Since then they are unused. Both buildings are listed (<http://www.stadtentwicklung.berlin.de>).

The Kolk is one of the oldest settlements. Part of the city wall are kept.



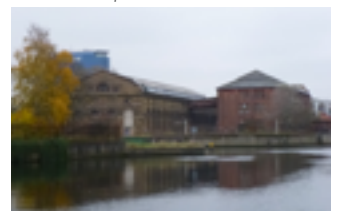
Nikolai Church (15 Century)



The Citadel Fortress

The Citadel is one of the best-preserved Renaissance military fortresses Europe's. Built from 1559–94 on an island created by the confluence of the rivers Havel and Spree. It was designed to protect the town. Currently it is used as a historic museum and has become a popular tourist spot. A lot of festival, concerts and markets are organized all year-round (<http://www.stadtentwicklung.berlin.de>).

Former Munitions fabric

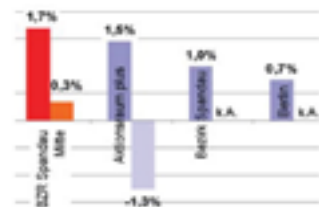


B.4. Analytical framework: Analyze social and ecological factors

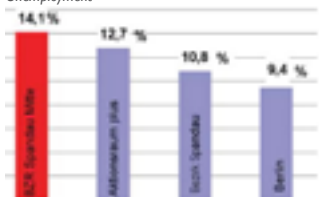
Demographic structure- 'BZR Spandau-Mitte'

Population development

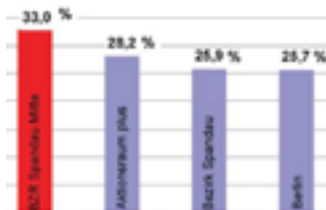
- population discrepancy 2010- 2008
- population discrepancy 2010- 2002



Unemployment



Population with immigration background



Source: integriertes stadtteil entwicklungs konzept Aktionsraumplus Spandau-Mitte, 2012

LEGEND

— "BZR Spandau Mitte"

Demographic structure

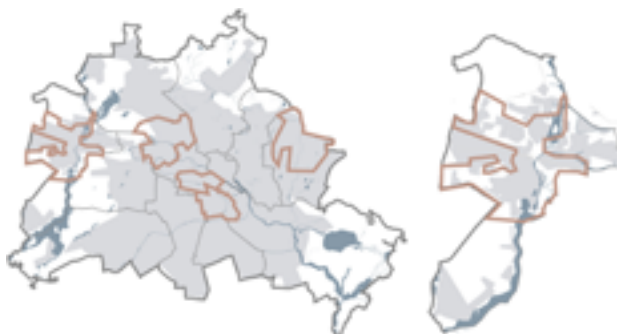
- ▲ Portion of population over 65 >28%
- ▲ Portion of population over 65 >23%
- ▲ Portion of population under 18 >19%
- ▲ Portion of population under 18 >16%
- ▲ Portion of population with immigrant background >40 %
- ▲ Portion of population with immigrant background >26 %

Demographic trends

- Poverty among old people >7 %
- Poverty among old people >4,5%
- Unemployment among young people>8%
- Unemployment among young people>6%
- Child poverty >65%
- Child poverty >43%

The five regions „Aktionsräume Plus“

„Aktionsraum Spandau Mitte“



Demography and development risks

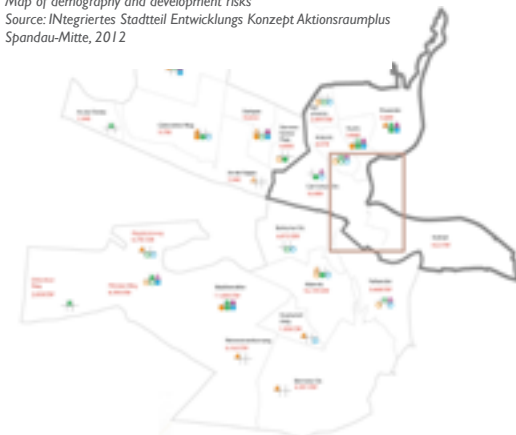
The Senate of Berlin decided in June 2010 to set five regions called „Aktionsräume Plus“, one of which is located in Spandau and called "Spandau-Mitte". These five regions are the most disadvantaged region in Berlin and are given priority in social stabilization management, as well as financial aid for development.

With the programme „Aktionsräume Plus“ the disadvantaged neighborhoods in Spandau get new opportunities. 134.208 people live in the area of "Spandau-Mitte", 4% of all Berlin and more than half of the inhabitants of Spandau. The under 18 year old have accounted for 15.8%, 46% of which have a migration background. Many people are unemployed and the educational opportunities for children are significantly lower.

The area "Spandau-Mitte" is further divided in 5 for the investigation of the social, economic and public services indicators. The old city of Spandau is located in the region "BZR Spandau-Mitte". With an area of about 3,030 ha it includes the central of the borough.

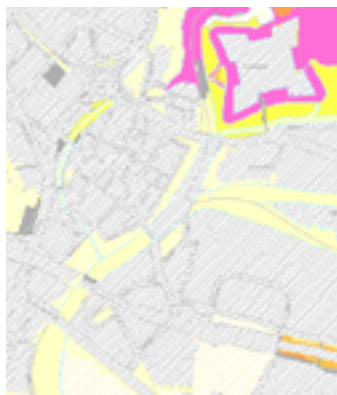
Map of demography and development risks

Source: INtegriertes Stadtteil Entwicklungs Konzept Aktionsraumplus Spandau-Mitte, 2012



B.4. Analytical framework: Analyze social and ecological factors

Biotope values and vegetation



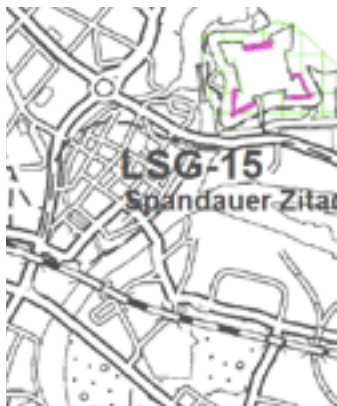
Biotope values

Source: Ecological atlas of Berlin,

Available on http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml [Accessed February 2014]

The value of the biotope types describes all-inclusively the value potential of a biotope type and makes possible at this level the mutually comparison of the types. They are evaluated by experts.

Biotope values are evaluated from 1 to 5. From the map can be concluded that there are no valuable biotope that should be conserved on the riverbanks, whereas on the citadel ring biotope values with extremely high and medium value locates are.

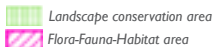


Protected areas by nature conservation legislation and NATURA 2000

Source: Ecological atlas of Berlin,

Available on http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml [Accessed February 2014]

The Spandau Citadel is one of the most important preserved fortifications and offers a wide range of cultural events in the historical walls. The Julius-Turm Tower affords a panoramic view of Spandau to the city centre and on the landscape. At the same time, the Citadel is a habitat for over 10,000 bats.



Vegetation

Source: http://www.stadtentwicklung.berlin.de/umwelt/umweltatlas/edua_index.shtml [Accessed February 2014]

55 vegetation types are represented in Berlin. They are arranged according to six general biotope classes or formations: built-up area, open space in settled area, areas used for agricultural, areas used for forests, bogs and bodies of water.

Open spaces in settled areas

Ornamental lawns (45%); shrub and tree plantations with weed communities (25%); ornamental flower beds with field weed communities (20%)

Heavily used park lawns (50%); park forests and shrubbery with ecotonal communities (25%); ornamental plantations of hardy perennials and shrubs with field weed communities (15%)

Areas used for forestal purposes

Alluvial forests (alder-ash forests and willow communities)

B.5. Analytical framework: Examine how the riverbanks developed over time

Analysis of the morphology of Lindenufer riverbank

1732

A city wall on the riverbank



Parade place

City wall

Since the foundation of the city, in Middle ages, the Lindenufer riverbank was outside the city wall.

For 1724 part of it was only used as a butchery meadow.

In 1724 there was the first expansion of the city towards the river. And the previously used as a butchery place became a parade place.

1844

Military use- Protection



Lunette

Later when Spandau was a military settlement Lunettes was build on riverbank to protect the city gates from invasions. One of the Lunettes was built on the parade place.

1880

Military industry development- military hospital



Military hospital with outbuildings(1851)

In 19 Century Spandau was one of the strongest fortresses of Prussia and was built to a center of defense industry.

About 1851 the Lunette was rebuilt in Military hospital with outbuildings. In 1886 it was reconstructed into in to barracks.

B.5. Analytical framework: Examine how the riverbanks developed over time

Analysis of the morphology of Lindenufer riverbank

1903
Changing character of riverbanks



1913



The character of the Lindenufer riverbanks started to change and serve as green area in the beginning of 20 Century.

----- Barracks (1886)

----- Public park (1900)

----- Charlotten bridge rebuilt for use of the river for shipping

1946
Lindenufer- Park for recreation and public space



The Historical town discovered the waterfront and expanded toward the river. Public places, Sightseeing boats and tourist cruises on the rivers Havel and Spree was document for first time. In 1901 Lindenufer riverbank was recognized as a green park.

----- Administrative building (1946- 1977)

After the 2nd World War II until its demolition in 1977 the buildings were used as administrative building.

1995
Linden ufer- Parking lot



2013



After the demolition of the lazarette, the area is used as a parking lot, that cut off the entity of the riverbank as a green area. The rest of the open space is in post war style- very plain with a poorly facilitated playground and some benches constructed.

----- Parking lot form 1977 until today.

B.6. Analytical framework: Analyze the identity of the riverbanks

Walking by the water- Serial Vision

Walk I: Havel promenade by the old city

Starting point of the walk:

From the starting point of the walk old city and its landmarks can be perceived.

Promenade



Promenade



Reichinger bridge



Railway bridge



Charlotten bridge



Promenade Stabholzgarten



End of walk: unexpected end of the continuous, uninterrupted forewards movement

Havel Lock



Promenade



Juliussturmbridge



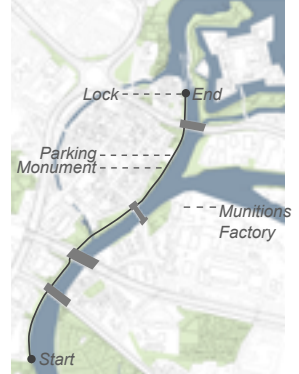
Parking lot; Lindenufer



Jewish monument



Munitions Factory, from Lindenufer



The bridges define the experience. Passing under them creates different perceptions of the open space. In addition, they are part of the changing emerging. The walk is not monotonous. On the contrary, the emerging views and heterogeneous boundaries of the open space make the experience of walking by the river vivid.

Emotions of the pedestrians are also alternating with the various views to attractive and not so attractive elements and objects.

B.6. Analytical framework: Analyze the identity of the riverbanks

Walking by the water- Serial Vision

Walks on the east side of the river

On this side of the river the riverbanks are more heterogeneous and less developed.

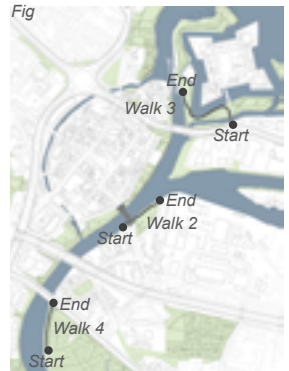
From the perspective of the pedestrian three routes on the east side of Havel river were explored. They are the only walkable parts of the riverbanks and they are not connected with each other. One must go inside the residential area and then it is difficult to orientate because of the lack of public spaces and landmarks. The only landmark from this side is the old Munitions factory, which is currently closed and unused. Walks three and four differ from the other two, because of the domination of trees and vegetation over the built environment.

Walk 3: Citadel to Lock

End of walk: Lock, unexpected view to Urbanized environment



Start: View to the Citadel



Walk 4: Green riverbank

End of walk: stopping in middle, feeling that the route takes you to nowhere, but private properties.



Start: From the bridge

Walk 2: Stresow Park

End of walk: Munitions fabric



Start: Boat stop

C. Exhibition posters

RIVERBANKS REDEVELOPMENT THROUGH SUSTAINABLE LANDSCAPE PRINCIPLES

A proposal for the banks of the Havel river in Berlin, Germany

HOW TO CREATE THE SUSTAINABLE VISION?

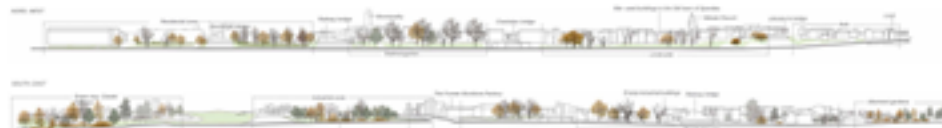


SITE ANALYSIS

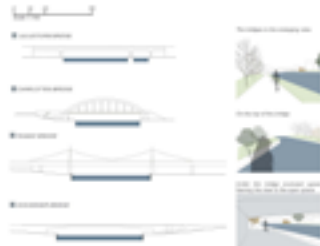
MORPHOLOGY OF THE RIVERBANKS OVER TIME



ELEVATIONS OF THE RIVERBANKS



SPACE DEFINING ELEMENTS: THE BRIDGES



TRANSITIONS-RELATIONS: BUILT ENVIRONMENT-OPEN SPACE



'GREEN SEQUENCES' RIVERBANK REDEVELOPMENT

VISION

SUSTAINABLE RIVERBANKS AS A SEQUENCE OF DIVERSE PUBLIC, NATURAL AND RECREATIONAL GREEN SPACES BY THE WATER.

STRATEGY

USE HETEROGENEITY: CONFLICTING USE PATTERNS OF THE RIVERBANKS AND CONTRASTS IN BUILT UP AND GREEN SPACES.

The project is a series of interventions along the riverbank, aiming to create a sequence of diverse public, natural and recreational green spaces. The interventions are designed to be flexible and adaptable to changing needs and conditions over time.



IMPLEMENTATION

1. CONNECT FRAGMENTS, CONTRASTS, CONFLICTS

Provision of light and shade, creating a sense of enclosure and defining the public realm. The interventions aim to connect fragmented spaces and create a continuous sequence of green spaces.



2. ACTIVATE FOR PUBLIC USE AND SOCIAL INTERACTION

Provision of seating, lighting, and other amenities to encourage public use and social interaction. The interventions aim to activate the riverbank for public use and social interaction.



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3. RESTORE ECOSYSTEM FUNCTIONS AND ECOLOGY

Provision of seating, lighting, and other amenities to encourage public use and social interaction. The interventions aim to activate the riverbank for public use and social interaction.



MASTER PLAN 'GREEN SEQUENCES'



SECTION C-C



SECTION D-D



LINDENLIER AVERBANK TRANSFORMATION

2070-2071



SECTION 5-6 WALK YOUR SENSES WITH



ACTIVE RIVERBANK AS EXTENSION OF THE OLD CITY
FOR PUBLIC USE AND SOCIAL INTERACTION

3. HISTORIC CITY BY THE WATER

The subsequent review suggests that universities are playing their role as employers of staff in the context of the existing educational environment and the region. The universities are responding to the local universities and to the educational needs and a variety of the non-university-related services in the region. The review found evidence that the role of the universities was changing in the existing state.



INCREASED ESTHETICAL VALUE

2. WALK YOUR DEAREST FRIEND

Further study, however, is warranted to understand the potential for these compounds to be effective in treating the patients. The compounds are the first of the class to be designed to be orally active, and the first to be designed to be orally active, and the first to be designed to be orally active.



2.1. PLANTS PALETTE "TOUCH, SMELL, SEE"

There are numerous and complex links in the pathways and systems responsible for the sensory-motor control of breathing. The brainstem is the site of the respiratory control system, which is responsible for the generation of the respiratory rhythm and the control of the respiratory muscles. The respiratory system is a complex system, and the control of breathing is a complex task. The respiratory system is a complex system, and the control of breathing is a complex task. The respiratory system is a complex system, and the control of breathing is a complex task.



2.2. PARKING LOT TRANSFORMATION PLAY WITH WATER, AIR AND PLANTS

The gold-mining industry is going to start a concerted drive to build green steel to take advantage. The government encourages investment in green plants, and is considering the possibility of a five-year grace, which gives the investor a five-year period in which to pay off the investment.



Play with water

These offers include insurance for periods of up to 30 days and may also include a guarantee of return, refund and/or credit.



• Egg with yolk

They are more imaginative and more
 in their confidence and
 development towards the future. I
 think that all these things
 contribute to the growth of the
 imagination in children. The
 art of the imagination is a



Play with us

[illegible]

THE SUSTAINABLE RIVERBANK

PROMENADE

The promenade is designed to offer walking, running, a bicycle lane and a playground area. It is designed to be a multi-functional space for recreation and for the revitalization of the riverbank. It is designed to be a multi-functional space for recreation and for the revitalization of the riverbank.



STAIRS AND WOODEN DECK

Stairs and wooden deck are designed to provide a connection between the riverbank and the city. The stairs are designed to be a multi-functional space for recreation and for the revitalization of the riverbank.



BALCONY

Balcony is designed to provide a connection between the riverbank and the city. The balcony is designed to be a multi-functional space for recreation and for the revitalization of the riverbank.



INCREASED BIODIVERSITY

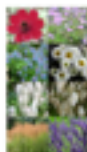
AROMATIC GARDEN



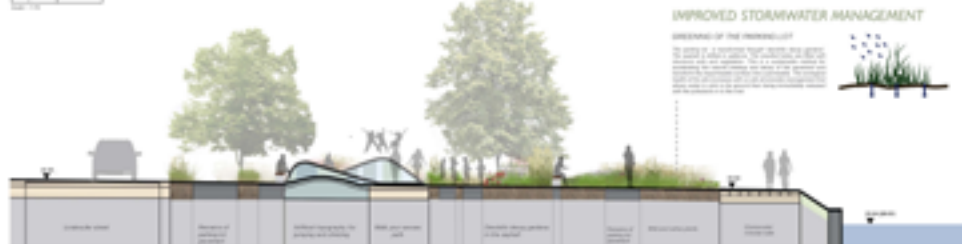
EDIBLE GARDEN



BLOOMING COLORS GARDEN



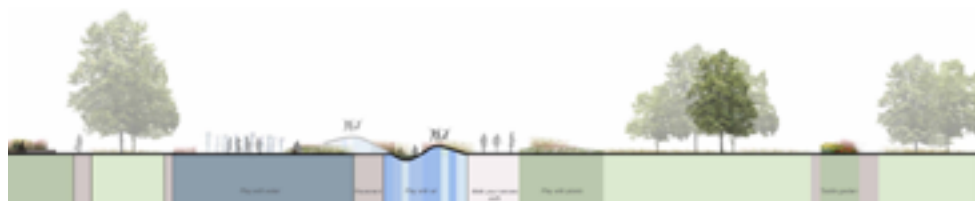
SECTION JUMPING LOT



IMPROVED STORMWATER MANAGEMENT

DESIGNING OF THE JUMPING LOT

The jumping lot is designed to provide a connection between the riverbank and the city. The jumping lot is designed to be a multi-functional space for recreation and for the revitalization of the riverbank.



ACKNOWLEDGMENTS



I would like to thank my supervisor Inger Lise Syversen and my examiner Lisa Brunnström who offered me encouragement, advises and helped me to finalize this Master's Thesis.

Above all I would especially like to thank my parents for the moral and financial support during my studies abroad. Thank you for believing in me and helping me to follow my ambitions!

RIVERBANKS REDEVELOPMENT THROUGH SUSTAINABLE LANDSCAPE PRINCIPLES

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A 30 credits Master Thesis in the Programme
Design for Sustainable Development

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