Turn the Tide! A landscape-based strategy for a resilient Knysna shoreline



Perspective / Promenade and Marina

Country /City			
University / School		Technical University of Mu	nich, TUM School o
Academic year			
Title of the project	т	JRN THE TIDE! A landscape-b	based strategy for a
Authors		1	

Germany / Munich of Engineering and Design 2022 a resilient Knysna shoreline Aimee Neff



Title of the project	TURN THE TIDE! A landscape-based strategy for a resilient Knysna shoreline		
Authors	Aimee Neff		
Title of the course			
Academic year	Waster Thesis in Landscape Architecture 2022		
Teaching Staff	Prof. Dr. Sc. ETH Zürich Udo Weilacher, M.Sc. Antonia Koukouvelou		
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-	Chair of Landscape Architecture and Transformation		
University / School	Technical University of Munich		



Written statement, short description of the project in English, no more than 250 words

Knysna is a small coastal town nestled on the northern shore of the Knysna Estuary in the Western Cape Province of South Africa. Today, Knysna is experiencing rapid population growth. The stable economy, good infrastructure and quality of life are reasons why the region is so attractive. However, a dark cloud glooms on the horizon as the region is increasingly threatened by the effects of climate change. Knysna faces multiple social, economic, and environmental challenges, which all require immediate action. However, Knysna will only be able to tackle these once it has faced its main rising challenge: climate resilience. The aim of this thesis is to develop a landscape-based strategy that can be applied on multiple scales, supporting Knysna's development into a climate-resilient and socially reactivated district.

The concept REACT(ivate) creates the base for this transformation to take place and consists of two steps: the first is to identify and react upon expected and unexpected climate change impacts. In the case of Knysna these are sea-level rise, drought, flooding, and wildfires. The second is to activate forgotten spaces by inviting people to rediscover the shoreline by creating opportunities for recreation. The design proposes a radical transformation of the town's central district to reconnect town and water. By retreating the urban edge, a connected shoreline with a variety of spatial qualities is created. The design places emphasis on the multidimensional value of public space, whilst preparing for a future with climate change-related challenges.

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The current state of the shoreline:



Due to the rising sea-level, the saltmarsh requires space to migrate inland. However, there is little space.



Polluted urban stormwater is directed into the estuary, causing erosion and impacting the health of the ecosystem.



Urban encroachment and land reclamation have resulted in a hard transition to the water - a faceless contact zone.

Layers of complexity





Regional Strategy (original scale 1:30 000)

A connected green network is created that wraps itself around the lagoon and stretches outinto the surrounding landscape along streams that feed into the estuary. A retreat of the urban edge means that infrastructure and communities must be relocated to other areas. This must occur without causing urban sprawl.

Design Concept / REACT(ivate) the Knysna shoreline



Identify and react upon expected and unexpected climate change impacts: sea-level rise, drought,

Climatic response typologies







Subsurface wetlands are used for the initial treatment of the stormwater.

Surface wetlands are used for the secondary treatment of the water. The clean water can be reused or replenish the lagoon.







Invite people to rediscover the shoreline by creating opportunity for recreation.



Detention basins capture large amounts of stormwater during heavy rain events and slowly discharge it into the wetlands.





Design Concept / React by retreating





Activate by inviting



Masterplan (original scale 1:1000)







Perspective / Saltmarsh Park



Plan of the Promenade and Saltmarsh Park (original scale 1:200)

Social invitation typologies



Bird hides, viewing platforms and piers allow people to experience the growing saltmarshes.

Edges between park and subsurface wetland can become interesting transition zones.

Unique experiences of the wetlandcreate opportunity to increase community awareness about climate change impacts.

Lowered/raised platforms invite people to make direct contact with the wetland, delivering sensory and atmospheric experiences.



Hard urban edges are transformed into inviting Small open spaces create opportunity to serve the public spaces, such as surrounding community by promenades. providing small-scale recreational activities.

Streets can act as green corridors, which additionally encourage social interaction.

the water.

The **Promenade** acts as a new central pedestrian zone and invites people to stroll and linger along the edge of the marina. Wide seating steps stretch along the southern edge of the promenade and provide access to the boat docks.

The Saltmarsh Park highlights the open quality of the Knysna landscape. Its main feature of the park is an elevated boardwalk, which offers its visitors a unique experience of the saltmarshes and the lagoon.

Knysna's urban edge is tranformed into a socially reactivated district, whilst establishing proximity and relation to



10m



Country /City University / School Academic year Title of the project Authors

GERMANY / MUNICH TECHNICAL UNIVERSITY OF MUNICH / TUM School of Engineering and Design 2019 BEYOND ALPINE IMAGE BERNADETTE S. BRANDL



Title of the project	Landscape-aesthetic conception between image and identity in the postindustrial Alpine region using the example of the refractory works in Leoben, Styria AT
Authors	BERNADETTE S. BRANDL
Title of the course	MASTER'S THESIS
Academic year	2019
Teaching Staff	PROF. Dr. sc. ETH Zürich UDO WEILACHER M.A. Irina Glander
Department / Section	/ Program of belonging CHAIR OF LANDSCAPE ARCHITECTURE AND TRANSFORMATION

University / School

TECHNICAL UNIVERSITY OF MUNICH / TUM School of Engineering and Design



BEYOND ALPINE IMAGE

Written statement, short description of the project in English, no more than 250 words

The former refractory works of the Styrian Magnesite Industry AG is located in the Austrian city of Leoben. The traditionconscious city with its global players in business and research strengthens its position as the second largest city in Styria. The industrial wasteland is an exemplary case for industrial change in the Alpine region since the 1980s. Exactly these landscape gaps need to be explored in a time when the landscape, its socio-cultural, economic and ecological demands, as well as its image and its identity, are on trial. "Beyond Alpine Image" gets in touch with the handling of a new landscape aesthetic in a changing regiopolis. The design shows how alpine communities can view their industrial wasteland as an opportunity for a new sustainable landscape. The site-specific qualities of the area are elaborated by developing a linkage of open space between the urban part and the naturally shaped landscape with the river. The aim is to create a link between traditional or local conditions and the new transformation process towards regional offers, so that the peculiarities of the alpine region are emphasized and the space-sociological significance of this place is revalued. Neighborhood and regional offers can contribute to the landscape change and create a tension between intensive and extensive spaces. Between image and identity it is about relating local and regional scale levels in order to serve as a catalyst for further development in the 21st century.

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1% water 1% Alps

1% gardens

4% other

5% buildings

9% agriculture





42% business

& crafting

size &

process of

falling fallow

location in the urban fabric

79% forest 1869 1900 1951 1961 1981 2011 2017 2030 ANALYSIS | POPULATION DEVELOPMENT OF LEOBEN LAND USE OF LEOBEN

IN THE DISTRICT OF LEOBEN

57%

57% ONE-PERSON-COMPANIES DISTRIBUTION OF CHAMBER OF COMMERCE MEMBERS IN THE DISTRICT OF LEOBEN BY DIVISION

21% other

13% tourism

24% retail













Country /City ...Germany / Munich...

University / School ... Technical University Munich / TUM School of Engineering and Design...

Academic year Bachelor Thesis 2021

 Title of the project
 Experimentation plant, A coal fired power plant as a new socio-ecological infrastructure.

 Authors
 Vincent Wenk

use of a coal-fired power plani socio-ecological infrastructure re-use plant Moabit: strategic re-unal power station as a new The therm Pow



Title of the project	.Experimentation plant, a coal-fired power plant as a new socio-ecological infrastructure .
Authors	Vincent Wenk
Title of the course	Bachelor Thesis
Academic year	2020-2021
Teaching Staff	Prof. Dr. sc. ETH Zürich Udo Weilacher, M.A. Martin Augenstein
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Written statement, short description of the project in English, no more than 250 words

The energy transition and the withdrawal from energy generation with hard coal and lignite raise the question how industrial infrastructures should be dealt with in the future.

Previous plans suggest energetic and cultural conversions or a complete dismantling of the sites. For the Moabit power plant in Berlin Mitte, due to the complex and dense urban context and the resulting economical, ecological and social demands for the location, none of the approaches is sufficient on its own.

Instead of developing a fixed Masterplan, the project implements a strong open planning structure and multiple coded and flexible rooms that can react spatially and programmatically not only to todays, but also to future ecological and social challenges of the 21st century.

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1. From an island to a city-connecting blue-green infrastructure.

2. From power generation to social production



3. Reuse and reinterpret industrial structures

The design transforms the introverted industrial site into a generous public open space that links the separated districts of Moabit and Wedding. The area becomes part of the cityconnecting Blue-Green Infrastructure. Two new park strips link the area with its surroundings. The Riverside Promenade becomes a new, representative connecting axis and makes the water of the shipping canal usable and accessable. In the south, the Track Park links the neighborhood with the Moabit district and shields from the noise of passing trains through its topography.





The industrial building structures form the basis for the new sub-quarters. The large open halls are filled with smaller, mobile buildings (block-inblock principle), other facilities are newly opened up by staircases or transformed into public open spaces. The material of the demolished buildings or walls will be reused as new surfacing around the playing field directly on site.



As in the past, the CHP plant should continue to actively respond to the needs of the surrounding city and change in the future. Further experimentation is to take place there. For this purpose, the site will be divided into four subareas: The Tree Battery, the Playing Field, the Crafting Gates and the Workshop Halls. Each neighborhood can reshape itself in different ways and respond to different crisis situations.



In the future, not only the chimneys of the coal-fired power plant are to be shut down. The area must adapt to the challenges of climate change and be sustainably designed and developed for the future. The area's degree of sealing will be reduced from 92 percent to 56 percent as a result of the new planning. A new stormwater management concept collects rooftop water during rain events, storing it in the former cooling towers. It can then either be treated and used in the buildings, or for irrigation and cooling of the area.











React to future challenges

Climateforest Green Room Shadow Hall Picknick Succession

Diversity Place of possibilities Arena Flex Room **Big meadow**

Coworking Cultures Roof **Together** Mon Habit Swap Room







Climate crisis

The climate crisis represents one of the greatest threats to all of humanity today. Therefore, future climate changes must be considered in every new planning. Rising temperatures with ever new heat records and low precipitation up to drought periods make the W increasingly arid. By capturing and storing rainwater on roof surfaces, watering of the tree canopy can be extended even during dry periods. Tree species selection should also be better able to withstand climate changes. Species are increasingly coming from climatic zones where higher temperatures already prevail. Even if isolated species cannot withstand climate change, they can be replaced, but the entire tree population is never lost. This is also beneficial in the event of a species-related pest infestation. In addition, the forest contributes to cooling the environment through shaded areas, binds Co2 and provides a pleasant microclimate in the otherwise heated urban space.

Health crises

Especially in the current pandemic, the issue of health in the life of each individual becomes an important asset that should be preserved. The outgoing restrictions have once again made us all aware that joint walks and meetings in the fresh air are an important social balance. The demand for open spaces, where people can meet in larger groups, is growing. At the same time, the need for quiet and protective nature is also growing. This is what the enclosed, densely vegetated forest can offer. Away from the pandemic, however, the most common diseases are so-called diseases of affluence, such as high blood pressure, heart failure, chronic lung disease and obesity. Prevention here can prevent many deaths and events such as heart attacks and strokes. One of the most important preventive measures is sport, or regular exercise. SpielFeld invites you to participate in both individual and group sports. Life in a big city offers many stress factors, two of which are noise and fine dust pollution from large roads. The large green area is shielded from the railroad tracks by the filledup embankment and also from the opposite bank due to the traffic-calmed street and the adjoining canal. The area is also located in a fresh air corridor, so the site contributes to stress reduction via several influencing factors.

Political crises



Our society is constantly evolving and diversification is also becoming increasingly important politically. Globalization leads to migration movements across countries and continents. A wide variety of cultures meet, especially in the melting pot that is Berlin. Social grievances such as sexism and racism are discussed in all social strata. It is important to create places where encounters and exchange are possible with the planning of the power plant area. For example, the district center is a space that can be shared and designed by all generations and cultures. The KreativGaragen feature workshops, swap meets and foodsharing initiatives that encourage people to live and experience neighborliness. A safe social environment increases resilience to future crises and can also solve individual problems collectively. The freely accessible roof terraces also invite activities such as gardening, playing and eating. They are intended to be a meeting place for all residents:inside the new apartments. Common rooms on each floor and spacious stairwells are also intended to create meeting spaces. Daily interaction promotes integration into a social fabric and can absorb and reduce social inequalities.

Material crises



A steadily increasing consumption of land and resources calls for innovative and creative ideas and approaches to solutions. Today's consumer society is living at a level that is not sustainable in the long term due to climate change, among other things. Among other things, it is a matter of getting away from disposable products and following the principle of circular economy. Objects are to be maintained as closely as possible without consuming large amounts of material and energy and, in the best case, reused. Even if no reuse or repurposing can take place, as much of the product as possible should be fed into other cycles and not be lost. Here, for example, recycling points or repair hubs can be set up in the large halls through the flexible subunits. Broken appliances or items of clothing no longer go straight into the trash, but are given and are used more sustainably. This also makes eve resource-efficient. But resources are also to be sayed on a large scale. Although the block-in-a-block buildings have a basic structure, they can be converted and thus reused without much material ex sports facilities, cafés, workshops, retail or co-w no limits to the users. Throughout the site, care is t construction waste as material elsewhere, in order transport to and from the site.



Country /City Germany/ Munich University / School Technical University Munich, TUM School of Engineering and Design Academic year 2019-2020 Title of the project Breaking the Island Authors Xiaozhen Li

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Title of the project	Breaking the Island	
Authors	Xiaozhen I i	
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Academic year	2019-2020	
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Written statement, short description of the project in English, no more than 250 words

"Breaking the Island" focuses on transforming a former oil harbor in Karlskrona, Sweden. Karlskrona, a city comprising 30 islands, reclaimed land in the early 20th century for economic growth. Among these reclaimed lands is the project site, originally filled to establish an oil harbor between the mainland and the main island. However, subsequent industrial decline rendered it a desolate wasteland. As the primary entrance to the city center, this abandoned land undermines Karlskrona's coastal identity, hampering its social and economic development while posing ecological threats. Applying the Structuralism theory, Xiaozhen Li conceptualizes Karlskrona's landscape into three layers: mountain, city center, and ocean. She argues that the abandoned industrial layer disrupts the site's original relationships with these layers, weakening the city's identity. To address this, the site is divided into three parts, each integrating landscape gualities from the respective layers to restore the original structural relationships. This approach establishes a coherent spatial rhythm, accentuating the site's role as Karlskrona's entrance and reinforcing its identity as a coastal city. Furthermore, the design interventions bolster ecological resilience and enhance the marine environment.

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The transformed industrial site is envisioned as a Creative Cultural Park, serving a dual purpose. It supports the burgeoning IT sector, facilitating Karlskrona's strategic transition from an industrial city to a knowledge-based hub. Simultaneously, it functions as a recreational park, fostering social integration between non-native and local communities. This urban conversion revitalizes the economy, fosters innovation, and encourages social cohesion, propelling Karlskrona towards a sustainable future.

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The Historical Development of the city of Karlskrona



ificially built main island:Trossö





became abandoned

IT Industry

Tourism

Sustainable Development

Since 1990s, heavy industry declined, while IT industry and tourism developed. On the main island Trossö, the resource of cultural heritage is very rich. There are a lot of heritage buildings distributed around it, while most new technological companies could only be located in the peripheric areas because of the land shortage on the main island.

Since 2010, the rapidly deteriorating ecological environment draws the municipality's attention

neby

SUSTAINABILITY is, thus, set as the guideline for the further development.

Economic sustainability:

keeping IT and Tourism as the core of economic developement, and improving the economic diversity to reduce the vulnerabiltiy

Ecological sustainability:

Karlshamn

increasing the ability to respond to the ecological threats, and reducing the impact to the natural environment

Back to the Quaternary Period **Naval Power**

The unique archipelagic landform was formed in 167 this period



The characteristics of bedrocks along coastlines: bedrocks scattering in the water.



The characteristics of plants along coastlines: the broad-leavedtrees grow directly into the water

In order to turn these scattering islands into a naval base, several smaller islands were grouped together, froming the main island Trossö



The main island was devided into two aparts by a enclosing wall: the southern part for the military use, while the north for normal citizens. Normal citizens were not allowed to enter the military part.

The military history drived the powerful development of Karlskrona. However, it also brought the clear separation of different social classes and a conservative mindset toward the outside.

The land morphology was further changed through reclaiming a lot of artificial fillings along the previoius shorelines and islets.

Heavy Industry



Modern infrastructures, such as the main road (Österleden) and the sole railway, were built. The city gradually spread toward the north.

Between the Site and its Surroundings





Situated on the east side of the archipelago, Karlskrona occupies over 30 islands. As an island city, it is primarily connected by ferries, both within the city and to neighboring areas. Karlskrona is well-known for its strategic naval base, which holds significant importance for Sweden. It is also well-connected to the mainland through a major road, Osterleden, and has a railway that extends westward towards Malmö and Copenhagen.





Defining problems in terms of the site 01 The visual significance not matching the functional significance

00000 TOOL

> The site is now faceless and unintelligible. This state of being faceless cannot match its functional significance of being the entrance to the ctiy center. 02 Weakening the city identity

> Being a crucial strategic hub for the entire city, the site fails to contribute to the city's overall identity and, in fact, diminishes its distinctiveness as a coastal metropolis. This issue will subsequently exert a negative impact on the economic progress.

03 Sea-level rising; Stormwater log; Marine ecological environment

From an ecological standpoint, the site is currently confronted with imminent perils arising from rising sea levels and the accumulation of stormwater. Moreover, as an artificial land reclamation, it exerts adverse effects on the surrounding marine ecological environment. 04 The conflicts between the old and the new social groups

As the influx of foreigners continues to grow in Karlskrona, the need for heightened awareness regarding the divide between this emerging social group and the established conservative local communities becomes increasingly crucial.

Drawing on the theory of Structuralism

"Concrete influencing of the intelligibility of

information layers

Peter Latz

The theory of Structuralism in Landscape understands landscape elements as physical carriers of information, being influenced by the semiotic theory. One of the most critical conceptual approaches of reading a landscape is to abstract it into several information layers, reducing the complexity of reality and gaining the most significant meanings. Information layers cannot be wholly independent and are always somehow connected and influencing each other. The relationships among different layers greatly influenced how landscapes are understood. Design, according to Peter Latz, refers to concrete influencing of the intelligibility of information layers.

Hypothesis

Under this theoretical background, the landscape around Karlskrona is abstracted into three layers, the mountain layer, the ocean layer, and the city center layer.

The industrial layer cuts the site from the three essential layers. This makes the site faceless and unintelligible. The entrance quality is lost; the city's identity is also weakended. The key to solve this problem is to rebuild the original structural relationships between the site and the three layers.

The project site had always been the enduring information lavers before the oil harbor was built in the 1950s.

However, the introduction of the intersection of the three industrial layer weakens Karlskrona's identity of being a city in the sea, which further influences the urban economic development.









before 1950s



Concept

Breaking the artificial land spatially, enabling it to reconnect to the three essential layers and thus regain the identity of both the site and the city.

Functioning as a creative pioneer park for IT start-up companies, and meanwhile, a recreational park for all citizens.





















View from the ocean to the site

contrary and and and

Node 03: High buildings appear here, together with a lot of commercial and cultural activities along the road. People get a sense of reaching the city center. The ocean canal works as a spatial element, separating the second and third spatial segments.

Node 04: The tree arrays on the train station square appear, signaling the start of the urban axis.

> *** *** ** ** **** -

117m

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Being a part of the ocean layer