MERWE4 WATERFRONT PARK

The transformation of a post-industrial harbour landscape in the city of Rotterdam
Merwevier Waterfront Park
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Thesis
Sanne Allersma
Stud.no. 1266578

Mentors:
René van der Velde
Robert Nottrot
External examiner:
Esther Gramsbergen

Department of Landscape Architecture
Faculty of Architecture
Delft University of Technology

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0.0 Introduction

0.1 Moving of harbour functions Merwevierhaven towards Maasvlakte II

Around 1400 Rotterdam already played an important role in the trade of goods. Rotterdam became a trading- and merchant city and the harbour functioned within the city. When in the end of the 19th century the port extended, the port and the city grew apart, they start functioning next to each other. Today, the port of Rotterdam functions as one of the main ports in Europe. To keep this leading role, an expansion towards the sea is needed. This is why the Maasvlakte II is being constructed. But result is that the harbour areas close to the centre of Rotterdam are getting empty and are changing in huge derelict wasteland.

Rotterdam is not the only city dealing with this industrial heritage, we can see this all over the Netherlands. Westergasfabriek in Amsterdam is a good example of how has been dealt with these unused, often contaminated and ecological disturbed, industrial areas. The terrain of the Westergasfabriek is transformed into a new park with cultural program in the restaurated factory buildings, dealing with water purification and ecological recovery; a multidimensional place, open to events and festivals. Another example of empty industrial terrain is situated in Vlissingen, where the redevelopment of the terrain did not evolve. The municipality bought the ground in 2003, with the idea to realise a high-quality live- and work area, but because of the financial crisis this was not going to happen and today the area is still derelict and full of fences.

To prevent a same situation in the city harbours of Rotterdam a plan is needed which takes present and future problems into account. In this graduation project one of the city harbours will act as case study to create a possible masterplan dealing with derelict industrial heritage. In the Merwevierharbour, the area at the Northern side of the Maas, the Fruit Wharf is the only port function left, and will move around 2015 to the Maasvlakte II. The harbour is located in between the historical city centre of Schiedam and Delfshaven and has good accessibility, so it has potential to bring new life into the area. The development of this type of land however, is complex because it intersects with cultural, social, political, economic, infrastructural, and ecological conditions, which are all related to one another. This asks for a different design approach then other projects, it must be able to respond to possible changes in the future. This will be explained later in the chapter about methodology.
0.2 Industrial wasteland

Due to change in industrial processes and global structural changes industrial areas no longer meet today's demand. Result is an enormous amount of industrial wasteland. These areas are most of the time situated outside the city centre, with an enormous surface area where everything is constructed and adjusted for functional use such as transport, storage, transit, production, factory works etc., so reintegrating of the area within the urban fabric is a complex task.

What makes it even more complex is our current economy, where there is no money to transform a derelict site from one day to the other into a newly designed area.

Although its a relative new problem within the Western world, there is already quite a lot written about 'brownfield sites', the official term for industrial wasteland. In 'Sustainable Brownfield Regeneration, liveable places from problem spaces' a brownfield site is stated as a site that:

- have been affected by former uses of the site or surrounding land
- are derelict or underused
- are mainly in fully or partly developed urban areas
- require intervention to bring them back to beneficial use
- may have real or perceived contamination problems

A brownfield site however, brings also opportunities along. 'In rapidly urbanizing areas, brownfields—if reused—can host new development and new uses that would otherwise spread throughout undisturbed landscapes far outside urban centres. Brownfields can help balance regional land-development processes, so that fewer virgin green fields are despoiled and the same time underutilized land can be regenerated,' as Kirkwood describes in his 'principles of brownfield regeneration'.

Alan Berger describes in his book 'Drosscape' how contamination and abandonment may bring advantageous ecological surprises. He states that ecologists often find much more diverse ecological environments in brownfield sites then in the native landscapes surrounding the brownfield sites. A brownfield site has the potential for creating new landscape design practices that at the same time during redevelopment clean up contamination, so to aim for the integration of reclamation in the final design.

In the images three park examples, constructed on former brownfield sites, are given. Park Andre Citroen, constructed in 1992, is situated at the former Citroen factory, which became in disuse in the 70s. The Thames barrier park is located in the docklands of London, and tries to regenerate the area. The international competition to design the park in 1995 has been won by Alain Provost. The Gas works park in Seattle is a public park on the site of the former Seattle Gas Light Company gasification plant, it opened in 1975.
1.0 Situation

1.0 Current situation Merwevierhaven
1.0 Situation

1.1 History and Development of the Merwevierharbour

Before the area functioned as harbour it was a meadow. Two dikes protected the area from water, and a creek was running in the direction of Delfshaven. The harbours on the south side of the Maas, the Rijn-Maas- and Waalhaven, functioned as transhipment harbour of bulk goods such as coal, ore and grain. These goods were transhipped with stream, so not much space along the quays was needed, while a bigger water surface was necessary for the ships. Around 1910 the need for cargo storage started to grow and this is how the first ideas arises to construct cargo and industrial harbour space on the North side of the river. With this type of harbour smaller water inlets were needed, but bigger quay space, for the cargo storage. Around 1912 the construction of the harbour was started with the four harbours in the East, the three harbours in the West were delayed because Rotterdam needed to buy some land of Schiedam, so eventually around 1925, the municipality boarder moved closer to the centre of Schiedam. With its location on the North side of the Maas the harbour area could be connected to the existing railway network to transport the cargo landward.

Because of the World War I there had been some difficulties with the delivery of cement, iron and coal, a good collected stock however made the construction possible. The designer of the harbours is aware of the developments in the competitive harbours of Antwerpen and Hamburg, and even in Londen, Liverpool, Marseille and Genua. The depth of the harbours are herefor constructed with the same depth as international straits as the Suezcanal and the Panamacanal, this depth is around ten meters. Because of the great need in storage space the harbour appeared to be a success.

1.1 Development harbour over time
1.2 The situation of Landscape Architecture today

Landscape architecture is a continuously evolving and developing profession which should be considered under the perspective of time. The task from landscape architects today is very different compared with the task a century ago. This, of course, has to do with our changing society. In order to understand the position of this graduation project within landscape architecture I will describe the new trends in the profession and the new role landscape architects should be taken.

1.3 A new era for landscape architecture

Recent projects for post-industrial sites show us that landscape architecture functions as a new medium for dealing with urban problems. Think for instance about the design of Field Operation for Fresh Kills in New York, or the design of Landschaftspark Duisburg Nord from Latz+Partners.

Field Operation won the design competition for the redevelopment of New York City’s last landfill with a size of 2,200-acre. Next to the enormous scale of the Fresh Kill landscape, the complexity of the site derives from its historical use as landfill, its urban position, and its wetland ecologies. The project is described as a “reconstituted matrix of diverse life forms and evolving strategies.”[1] Here a matrix is used as a tool for dealing with the complexity of the site. The solution for these complex layers should not be sought in the design of a fixed and final plan, because a landscape cannot be fully controlled or even defined. Field Operation approaches the project therefore with a framework where the different site conditions, treated and elaborated in their own way, are being held together.

Landschaftspark Duisburg-Nord was an abandoned industrial zone along the Emscher River, which has produced steel for about a hundred years. The approach for this project is to reposition its industrial past by adaptive reuse with a limited amount of resources, also known as a laissez faire approach.

These types of projects make clear that design for post-industrial reclamation and remediation sites involve a trajectory of strategies dealing with repurposing, transforming, and eventually must the site be rethought for new development. The reason why such projects are being realized partly from our realization that we, as a society, have contributed to the deterioration of our environment. Landscape architects and urbanists can help to find a way in improving our environment again. That landscape architecture acts as a new medium of urban order has to do with its crossing disciplines, the ability to think big and small at the same time, and the different purposes it serves. Many successful infrastructural projects for instance often involves landscape architects.
1.4 The art of survival

In order to play a key role in the improvement of our environment, in the rebuilding of new land for a new society where people are urbanized, global, and interconnected, Kongjian Yu states that landscape architecture 'must define itself in terms of the art of survival, not just as a descendent of gardening.' [2]

This post-industrial era where a demand for urban redevelopment has arisen imposed by the processes of industrialization and urbanization especially applies to China. Kongjian Yu describes on the basis of an ancient Chinese story about a 'land of peach blossoms' what has been disappeared in current cities, land and peoples mind. Landscape architecture however, can play a major role to bring nature, people and the spirits together again in order to create harmonious landscapes. To the question how landscape architecture as a profession should respond to these challenges and what principles should be adopt to prepare for this key role of bringing land, people, and spirits together again, there are three points explained. The first point is about the need for a different view, a modern view on landscape architecture. Too often landscape architecture is associated with the ancient tradition of gardening, instead of addressing major environmental issues. Not only landscape site needs to be recovered, but also the profession of landscape architecture needs recovery. As second point is stated that the authentic relationship between people and land should grow again, the authentic relationship gives the culture and the people its identity. The last point is about the leading role of architects and planners in urban development. The processes of urbanization and globalization happen very quickly. Current greenbelt or green wedges have not been able to prevent urban sprawl. This has to do with the lack of ecological integration. A new ecological planning model must be applied where time is visualized as a line that links, and as a tool that links the different layers of physical, natural and cultural processes. With this model the plan is adapted to the existing land, where it fits the internal values of the earth, so the best development plan can be achieved.

To get an idea of how this theory of Kongjian Yu about the art of survival is to be put into practice, five of Turenscapes (the office where Yu is president of) projects with their own principles are given as example.

1) The Floating Gardens of Yongning Park
An ecological approach to flood control and storm water management as a model for the entire river valley is used. The park is accessible for tourist and locals and reveals the beauty of native vegetation and the ordinary landscape.

2) The Rice Campus of Shengjang Architectural University
The Shengjang University Campus is a productive design, where rice is grown, irrigated b storm water which is collected in a pond. Within the rice fields open study areas are located. In this project is shown how agricultural landscape can become part of an urban environment and where cultural identity has arisen out of the productive character of the site.
3) Zhongshan Shipyard Park
The park is created on a former brownfield site, arisen from its previous function as shipyard. The approach for this project, in contradiction with the ‘laissez faire’ approach of the Landschaftspark Duisburg Nord, uses the principles of preserving, reusing, and recycling natural and man-made materials. The original vegetation and natural habitats were preserved, and only native plants were used throughout the landscape design. Industrial remnants such as docks, railways and machines were recycled for educational and functional purposes.

4) The Adaption Palettes of Qiaoyuan Park
This last examples area is another model showing the effects of rapid urban growth. What used to be an outdoor shooting range was changed into a garbage dump and drainage sink for urban storm water. The site was heavily polluted, derelict, abandoned and surrounded with slums and temporary shed-like structures. In order to transform this land into a park, adaption palettes were designed. These adaption palettes consist of pond cavities of different depths, storm water retention, the creation of diverse habitats, and the sowing out of seeds of mixed plant species. In this way the land will be recovered by the arise of natural processes, and where visitors can have an aesthetic experience.

1.5 Landscape urbanism

This new era or ‘trend’ in landscape architecture, introduced in the previous paragraph is further elaborated by Charles Waldheim under the term “Landscape urbanism”. He states, like many others, that traditional urban design offers too little solutions for the current problems of big cities. However, landscape is a medium suitable to respond on temporal change, transformation, adaptation, and succession, a medium focused on processes. It can be seen as ‘a salve for the wounds of the industrial age’ (Waldheim, Landscape Urbanism) whereof the competition of Park the La Vilette played an important role in increasing the awareness of landscape as a framework for an urban transformation of the city.
2.0 Research Questions
2.0 Research questions

Main question

How can an industrial wasteland of a city harbour be transformed into a public park, in a way that it strengthens the identity of the relevant city and at the same time – when necessary – deals with flooding risk?

Sub questions in relation with the city of Rotterdam

- How to connect the River Maas with the city of Rotterdam again?
- What types of waterfronts are there at the moment and how do they work?

Questions in relation with the project area

- How can the enormous scale of a harbour area be emphasized while functioning as a qualitative public space?
- How to relate and involve the surrounded neighbourhoods in the harbour area?
- How to make people aware of the former activities and functions on the area, and of the unique location along the river.
- How to change the current life style of people from consumers to producers?
- How to deal with contamination on the harbour site?

Larger scale questions

- What will the design project add for the city of Rotterdam?
- How will be dealt with the current financial crisis?
- Dealing with a transformation project, how will be dealt with the different phasing of temporary effects and future developments?
3.0 Landscape Analysis of the Merwevierharbour and its surrounding
3.0 Landscape Analysis

3.1 Development of the area

The most determining factor of the structure of Rotterdam is its location along the river, close by the North sea. The area at the Northern side of the river Maas originally was ‘waddengebied’, protected from the sea by the dunes, which slowly turned into a swamp forest. Because of the death of the trees, the remains created a layer of dead, water-bearing organic material, we call this peat soil. In figure 3.1a we can see the river flows and creeks, flowing through the swamp area, one of these streams is the Rotte.

The Southern side of the river Maas, the Delta, is around 1400 still for a large part under water, by influence of the tides of the North Sea and the changing water levels of the river itself. Meanwhile a continuous dike front is created, where the dam-cities started to grow. The interaction between human interventions and the dynamic of the sea and river eventually caused a stable situation of the Delta (figure 3.1c).

In the 15th and 16th century Rotterdam already had an international position as trade centre, mainly in herring. With the excavation of the ‘Nieuwe Waterweg’ in 1866 the route towards the sea was improved and the Rotterdam harbour slowly expanded further towards the sea.

In figure 3.1d the situation in 1958 is shown, where the Maasvlakte and Europoort are constructed, and parts of the dike front are moved, so the outer dike area along the river grew bigger.

3.2 Weak dike points

After several researches the current dike front appeared to have weak points in it. The project area is enclosed by the continues dike front, where some points could be dangerous in the future, as can be seen in figure 3.2.

The reason why the area is not flooded is the height of the ground level; the harbour is increased to an average surface level of 3.2 meter NAP (Normaal Amsterdams peil). But now the climate is changing, the outer dike area has a higher risk of flooding.

The average temperature within the Netherlands has increased in the past centuries with 1.7 C, the total amount of yearly rainfall has increased with approximately 20 % and the frequency of heavy rainfall increased strongly. With current perspectives the climate change will continue in the coming centuries. One of the effects is an increase of flooding. With Rotterdam’s position close to the sea the city faces a higher flooding risk because of sea level rising as well as rain peak falls.

So improvement of the dike is necessary, and because of the projects outer dike location, there is an opportunity to combine these two problems into the transformation project of the harbour area.
3.3 Isolation urban fabric

Because of the development of the harbour in Rotterdam, the city itself also started to extend. In the image we can see the urban structure around 1910, just before the construction of the Merwevierharbour. Visible are the extensions of the city centre of Schiedam and that of Rotterdam, with the meadow and creek landscape in between. After the construction of the harbour area the need for housing also grew bigger. This results in a highly urban and dense structure of the city, visible in figure 3.3b. The bombing in World War II played an important role in the reconstruction of the city of Rotterdam. At the time functionality played an important role, the city was seen as a tabula rasa resulting in a dominant infrastructural network laid down on the city.

Figures 3.3c and d show us the isolation of the harbour area within the urban fabric. The area was purely established to function as harbour, so the accessibility from the car road is good but the area is not part of the city.
3.4 Lack of green space

In relation with the expansion of the city and the functional thinking after the war, there is few space left for public green space in the cities of Schiedam and Rotterdam. Along the Maas we can see the Euromast Park, designed in 1852 by father and son Zocher. A big part of Rotterdam’s green space exists of strips along canals and some static streets with long rows of platans. Adjacent to the West side of the project area a new roof park on top of a big long shopping mall is being realised. The roof park functions at the same time as dike. The continues dike front is only at a few spots recognizable as a grass dike, at the Schiedamse dike, the Northern border of the project area, this is the case. In the majority however the dike is paved with no steep slopes and infrastructure on top.
3.5 Urban agriculture as solution for fallow plots

Because of the current economy the construction of new buildings is on hold, with the result of empty pieces of land within neighbourhoods. Citizens see this as an opportunity to give their district a bit more nature and soon these empty plots are considered as extra garden space for the neighbourhood. Urban agriculture occurs on different scales. A project on the smaller scale is for example the beehives on the central library of the city. There is a shortage of bees within and around the cities, which result in insufficient pollination of fruit, vegetables, seeds and nuts. The largest project of its kind, situated in the Merwevier harbour, is the urban farm ‘uit je eigen stad’, where food is grown, sold and served in one place. Founded with the ideoslogical goal of bringing people closer to their food again. With their own shop, restaurant, harvest celebration, workshop, child-activities, educational events they are doing a good job in pursuing their goal. The design project will connect with these development, and the principle of urban farming will play an important role within the harbour transformation, but this will be discussed later.

3.6 Developments in Rotterdam heading towards the river

In Rotterdam several activities and projects are developing from within the city center towards the river Maas. These activities mainly exist of room for public space and a creative industry. On the Leuvehoofd a public garden is realized, on the Mullerhoofd on the initiative of the neighbours a community garden has arisen. Coolhaven can be seen as small area development responding to current demands organized by individuals and neighbours. The Schiecentrale is a former electricity factory transformed to a cultural industry, where companies and artist work next to each other and together. Close by in the Schiehaven a public space is filled with sport program and changing events or activities.
3.7 Spatial relation between river and land

The places along the river Maas are different in function and appearance. The most parts still exist of harbour functions, or still have the appearance of its former harbour functions, clearly visible from the river. The relation with its hinterland is at some places stronger than others. The continues dike front is playing an important role here, because it always somewhere in between the river and its hinterland. Starting from the West, at the Maasboulevard, section A, there is a clear relation between the river and the land. The dike front is integrated in a park along the river where people can experience the view over the river, behind the dike nine large living blocks create a clear boarder with the park, separated from the neighbourhood in the North. In the section is visible that water is a recurring phenomenon, following the canals within the city to the South always leads you to the river. In section B the neighbourhood Schiemond is located along the waterside, but the living blocks are facing each other and the blind sides of the buildings have no relation with the river. In this section the new project ‘dakpark’ is visible, where the current dike is improved and transformed into a shopping street with a park on top, here the dike is not a separating element but a connecting one. The section at Mullerhoofd shows some developments improving the connection between city and river, but the area is cut off from its hinterland by a car road situated on the dike. The last section, cutting through the central station with its high rise and the shopping center, shows how the dike, with its infrastructure, again forms a boarder and how high buildings determine the face of the waterfront.
3.8 Research current waterfronts

This research gives an overview of the current public spaces along the northern site of the river Maas and the watersides within the city of Rotterdam and Schiedam. The founded places along the waterside are divided into different types: nature, park, garden, path, (historical) quay, activities, and function. In the image on the right the places are shown, the table shows which place belongs to what type and what types of people are attracted to them.

The only nature, hidden behind housing and the dike, is inaccessible for visitors. The only park along the waterfront, the Maasboulevard, is located in the extension of this piece of nature. Because of its location along the Maas the park attracts a lot of visitors from Schiedam.

Under the category garden there are three locations found, of which one a playground, one a community garden and one a public garden. The playground is a small one and is used by residents, the community garden, an initiative of the residents themselves, is a popular place for the neighbours and their children. The public garden on the Leuvehoofd attracts more people from outside of Rotterdam because of its modern design and its view on the Erasmus Bridge.

The cycle path on the Bartel Wiltonkade follows the river and provides a good view over the river from benches along the path; only thing is that it does not connect anything specific, so only neighbours from Schiemond make use of this path. Aelbrechtskade however, is situated along an import infrastructure route so more residents make use of the quay to enjoy the waterside.

Delfshaven still has its historical centre, situated around the canal, which is a touristic attraction, this counts also for the other quays, except the Achterhaven where a combination is created between modern housing and historical quays.

The rough identity of the soccer cage at the Schiehaven, with the big empty square open for events next to it, fits within the harbour characteristics and attract a lot of young people to play soccer or meet each other. Coolhaven with its cultural focus point has a complete different appearance and attracts a different kind of public, but can be seen as a creative gather point.

Reason why people gather at Sint Jobshaven and the Maastunnel is the functions they fulfill, the stop for the water taxi and a tunnel for bicycles whit a snack bar next to the tunnel. These functions, in combination with its location along the Maas make it a meeting point for locals or a resting point for visitors.

The last waterfront of the functional type is the Maritiem museum, where the public space is created in extension of the museum, more as function to attract people then as a public space to stay or visit.

On the next page every location is shown in relation with the water.
3.9 A lack of waterfronts typical for Rotterdam

Rotterdam is working on the developments on the quays in the center of the city, in this way Rotterdam tries to make a relation with the river Maas again. In the research of the existing waterfronts we have already seen the new design for Leuvehoofd, one of these developments. Another new design is situated on the Westerkade, lying in a linear line with the Leuvehoofd. These new design do not match with the identity of Rotterdam as harbour city, where the emphasis lies on its large, open and hard character. The design for the Leuvehoofd however is fine, delicate and precisely detailed, which stands in contrast with its surrounding. The Westerkade, situated in front of the historical neighbourhood Scheepsvaartkwartier, introduces a new formal language. This distracts the visitor from the original forms and appearance of the place, where the view over the Maas opened up trough the tree trunks of the Elms. Now this view over the open surface is blocked by raised planting beds. The row of Elms have been retained.

So despite the new development along the waterside, Rotterdam still lacks of a public waterfront of proper scale, fitting into the rough character of the city.
3.10 Conclusions

The founding of the analysis on the large scale can be translated in aims for the project:

- Strengthen the current dike front
- Make the harbour part of the urban structure
- Provide public green space for the citizens of Schiedam and Rotterdam
- Relate to the development of urban agriculture
- Connect to the developments along the waterside
- Create relation between river and city, where the dike will connect, instead of divide

- Create public space along the waterside (to connect with the river)
4.0 Methodology
4.0 Methodology

Now we understand the surrounded area and its relation with the project area, and we know what the aims for this larger scale are, we need to find a way to analyse the project area itself and to construct the principles for the design. In order to deal with the transformation of a derelict harbour site into a public park, together with the sites complexity, history and new program a certain design method is needed. Because the phenomenon of post-industrial land is something new, something of our current society, a methodology other then before is needed.

Briefly, with this new methodology, suitable for large transformation areas, multiple forms of organization on the site are layered, where the different aspects of the site are not put under one language of design. We have already seen this in the project of Fresh Kills (chapter 1.3), where detailed diagrams phasing, animal habitats, succession planting, and hydrological systems, as well as programmatic and planning regimes present an overview of the complexities of the site.

Following on the theory about this new landscape architecture, or using Waldheims name 'landscape urbanism', is a shift in design methodology.

The attitude of the French architect, urban planner, and landscape architect Alexandre Chemetoff fits in this new methodology for landscape architecture. His design methodology will be explained based on his project Ile de Nante, an island in the Loire that had once been used by the shipbuilding industry and afterwards forgotten for decades. But first an appropriate design approach is described, in order to do understand how to make a proper analysis for the harbour area.

4.1 Process-driven design

The transformation of industrial wasteland needs a process-driven design approach that does not intend to create a definitive plan for the site. The design and construction of such a large area take years, if not decades, so it is important that there is a framework that adapt to changing conditions rather than forms composed to conform to an aesthetic whole.

Because of this changing conditions it is the more important to give the project a strong identity and stress out the enduring qualities of the harbour area, so the project becomes a socially and culturally recognizable place for the citizens of Rotterdam.

‘Working with a process-based approach, rather than a purely compositional one, demands four significant shifts in design methodology. First, the dynamic nature of the material itself requires one to design processes rather than a landscape’s final form. Instead of introducing external forms and transforming the site to accommodate those forms, these are "found" and evolved out of systems already there.

'Second, there is a shift in design methodology toward dedicating more effort to site research than once was the case in formally focused design approaches.' [3]

This research makes clear how it evolved in time, why it is in its present state and if there is for instance toxicity.

'Third, history is understood as a process itself, rather than a visual reference for form, style, or type.' [3]

To find out what the geologic origins are of the Merwevierharbour, we have to know its trajectory, what it was before it became a harbour site.

'Fourth, process-based practices anticipate change from the outset, understanding that their intervention is only one of many in the immense evolutionary process of the landscape.'[4]
4.0 Methodology

4.2 Alexandre Chemetoff and its dynamic masterplan

In 1987 the shipyard on the island was closed, and the city of Nante was confronted with this 337 hectares industrial wasteland, cut off from the city by a branch of the river Loire. Instead of pulling down the derelict industrial ruins Chemetoff used the history and fragmentary character of the site as a narrative. By visiting the site very often and in an extensive way, Chemetoff and its team set up scenario’s to determine the contours of the terrain and investigate which opportunities the terrain provides. In a map the current situated is showed together with running projects on the site. In the meanwhile workshops are organised to gather opinions and ideas from citizens and stakeholders, to take these as starting points. This is how the dynamic masterplan existed, which was updated by the office every three months over a period of ten years. On this map all layers were shown, all structures, materials, vegetation, and projects. The map did not show a fixed or final design, it served as a guide or suggestion for other architectural interventions. The public space served as a connective element of the smaller interventions made on the site, and was therefore the determining factor of the process. Direct references were created with the existing elements on the terrain in order to tell the story of the site. The aesthetic value of elements like bricks, railway tracks, crane systems, warehouses, vegetated and sealed surfaces were not important, they got a new place within the public space, in this way the objects restores a certain quality, a temporal quality. This quality arises from the idea where two temporalities are introduced where the time of construction and the time of development are confronted. The project can be divided in three phases, the first phase (1987-2000) existed the origins of the project, a vacant industrial area, when the city began to search for a team to transform the site. The second phase (2000-2010) shows the transformation leaded by the team of Chemetoff, a project that is adaptable for changes in the urban dynamics. The third phase (2010-2020) is led by a different design team and connects to the ideas and interventions of the last phase. The focus in this phase is on developing mobility, introducing a landscape backbone to connect the neighbourhoods on the island, and intensify the relation between the riverfronts.

The developments realised in the second phase are all done at reasonable cost, with simple materials such as concrete, granite along the water channels, and plants. This also has to do with economic choices not to increase the price of the land; the team adopted the principle of a reasoned balance between costs and effects. Difficult for this phase is that the project has a temporality, it provides a program on a given site in a given time, but it retains the possibility of new program in the future. The way Chemetoff’s team dealt with this problem can be explained by the intervention of Daniel Buren’s rings on the Quay des Antilles, together with the terrace. This quay was inaccessible, empty and felt a bit unsafe and needed to be quickly transformed into an accessible place, where the city and the river would meet. With Fig.4.2.1, masterplan, programmatic scheme of the island, workshop, site as industrial wasteland, Quai des Antilles with art of Daniel Buren, future program and design.
the art project of Daniel Buren the length of the quay is emphasized and the view on the river is framed in every ring. These artistic interventions are not signs of transformation, the purpose of this work is to welcome something else, and it leaves room for other initiatives, other events, or other activities. Often is thought that the city or the urban form would be a project in itself, or even as a self-sufficient project, but more important is what this urban form enables and what it welcomes. The rings and terrace on the Quay des Antilles help people to feel at home along the riverside. This relationship with the river and the terrace will stay whatever comes next. With that in mind we can imagine how new forms of architecture will integrate behind this waterfront, so the quay as public space remains. The place has a program, so if buildings will arise there, the area will already be a destination place for leisure and strolling. So what makes a place busy and with activities is also the transformation itself, in this way public leaves space for initiatives in the city.

The interventions realised by the Chemetoff and its team can be organized in four different types: public space, economic activities, housing and infrastructure. A lot of the economic activities are situated in old industrial buildings, which are renovated. All these interventions, especially the public space, are invented from the discovery of the places.

4.0 Methodology

Fig.4.2.2: Green: public space, Pink: economic activities, Purple: housing, Blue: infrastructure, Yellow: mixed use
4.3 Preserve, renovate, adapt

Another method where the emphasis is not so much on transformation and process, but more on a framework of preservation, renovation and creating of new forms can be applied on industrial heritage sites. This method will be explained by describing a short comparison of two projects: Park Zollverein in Germany, and Zhongshan Shipyard Park in China. Park Zollverein had the former function of a coal mine, Zhongshan Shipyard Park, as already is in the name, used to be a shipyard.

In figure 4.3a the relationship of the two areas with the urban context are shown. Park Zollverein has a good connection with its surrounding infrastructure because of its former function. Zhongshan Park existing paths and routs are extended from the urban fabric into the park; this is a different relation because of its scale.

In the next two images the remaining buildings and elements of the former industrial functions of both sites are shown in a schematic plan. The buildings designed for the Zollverein mine have a powerful identity because of their combination of functional and representative, relating to the Bauhaus style. Therefore the buildings needed to be renovated so program could give the building a second life.

In the Zhongshan park this is different, the buildings and sheds were decayed and in poor condition, and needed to be adapted in order to get a second life. Two big sheds along the waterside were stripped and painted over, in this way two new pavilions arisen. For two other industrial buildings is done the same, with a few adjustments new forms are created. The red dots in figure 4.3c represent these new pavilions, created from old buildings.

A new path system, based on historical morphology connects the entrances and the hotspots. A same approach is used in Zollverein, where the rail tracks were transformed into a new path system, connecting the new program in the old industrial buildings.

In both parks nature is preserved and was seen as starting point for new nature.

In the last two images the different layers of the masterplan are showed in a schematic way. Difference is that the new path system in Zollverein leads towards the paved and build areas, so it are routes connecting one place with another. While the path system in the Zhongshan park is a route on its own, walking the paths people are led along the pavilions or through a place, which can be seen as loose objects divided over a routing.
5.0 Analysis Merwevierharbour
5.0 Analysis Merwevierharbour

5.1 Infrastructure and current building functions

The infrastructure in the harbour area is very clear and exists of wide asphalt streets, designed for heavy trucks loaded with cargo. Despite the fact that there was such a big need for cargo storage around 1920, this need slowly decreased. This can be seen by the current functions of the sheds and factories situated in the harbour. A very large part is taken over by smaller companies like car dealers and garages, but also by some parties from the cultural sector. Only two functions originate from its harbour function: the e.on gas factory and the Fruit Wharf. The gas factory however is out of date and in the Maasvlakte II a new factory already is built and in use. With regard to the Fruit Wharf, it needs more space, and will find a new place for this also in the Maasvlakte II.

For a large part of the old industrial storage sheds it was hard to find new renters. There are therefore still a couple of empty, giant sheds.
5.2 Important buildings

During the bombing of the World War II, a lot of factories and buildings in the Merwevierharbour felled. This is why the harbour area does not contain a lot of industrial monuments, and therefore misses some identity. A big part in for instance ‘Cultuurpark Westergas’, or ‘Park Zollverein’ has its qualities due to its industrial monuments. The qualities of the Merwevierharbour should evolve in a different way. Some buildings however do have the potential to be renovated and to contain new functions.

For the buildings in the area we apply the method of preserve, renovate and adapt. Some of the important buildings of the area are in good condition and are able to take a new function. Others need some small adaptions and renovation in order to take a new function. Of course the functions are adjusted to the state of the building, the place it is located, and the new program of the area.

To create a strong and recognizable identity within the area, some buildings will be adapted in such a way new forms are created. The round concrete storage tanks of the gas factory for instance, can be stripped until the steel construction is left, this can be painted and function as new pavilion for the area. Sheds are also suitable to strip till the steel construction; in this way it can get a new facade in order to fulfill a new function.
5.3 Ground level

Next to the large surface of asphalt roads the area is mostly paved with concrete paving stones. Some places are paved with tiles and Stelcon plates, whereof remaining plates are piled at certain spots in the area. Some factories and sheds are already demolished without replacement of something new, whereby little room was created for some pioneer vegetation. This was also the case at the Marconistrip (the green strip in the North), where the former railway network leaded into the harbour. The train rails are already removed and replaced; this is also the case at the Vierhavenstraat (the East side) where in the meantime a shopping mall is being built with a roof park on top. The green area in the Southeast of the harbour area, across from the Maasboulevard Park, is being used by citizens from Schiedam for walking the dog or for fishing as a social gathering activity.
5.4 Soil research

There have been a lot of changes since the harbours are constructed. In chapter 1.1 about the development of the harbour we have seen these changes. The two water inlets of the Keile- and Lekharbour are partly embanked to create more land for storage space. Same applies to a little harbour in the end of the Keileweg (the Southest point of the area), where, because of the embankment still old quay-walls can be found. After the war a large part of the quay-walls are renovated, so the current conditions of the quays are still good.

Effect of all these harbour and industrial activities over the years resulted in contamination of the soil. The biggest factors of the contamination in the Merwevierharbour are the old gasworks which was active from 1913 till 1967, a Steel factory, active from 1916 till 1947 and the Machine factory Van Berkel, running from 1923 till 1991.

In the map of figure 5.3a the places of the contaminated soil can be found, together with the type of contamination and the cause of it.

To deal with this contaminated soil in a responsible and sustainable way, so not to remove the problem to another place, the soil will be cleaned on the project area itself. This will be done by the technique of phytoremediation, in other words, the soil will be cleaned by the use of plants which are able to attract the contamination out of the soil and store it in their roots or leaves. What type of plants are able to do is can be found in an image on the second next page.

<table>
<thead>
<tr>
<th>ZM</th>
<th>Zware metalen (arsen, cadmium, chroom, koper, kwik, lood, nikkel, zink)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAK</td>
<td>Polycyclische aromatische koolwaterstoffen</td>
</tr>
<tr>
<td>MO</td>
<td>Minerale olie</td>
</tr>
<tr>
<td>VKW</td>
<td>Vluchtige aromatische en gechloreerde koolwaterstoffen</td>
</tr>
<tr>
<td>FE</td>
<td>Fenolen</td>
</tr>
<tr>
<td>CR</td>
<td>Chroom</td>
</tr>
<tr>
<td>CN</td>
<td>Cyanide</td>
</tr>
</tbody>
</table>

GM = Screening op organische verbindingen mbv gaschromatografie- massapectrochemie |
GEB = Gemeentelijk energiebedrijf

The contaminated places, with the cause of the contamination and the type of contamination

Soil layers, depth and type with depth waterinlets.
5.5 Remediation techniques

There are many techniques to clean contaminated soil. A subdivision is made in the following subjects: In Situ cleaning, Excavation, Isolation, and dredging with transportation. With In Situ techniques the soil can be cleaned without shuffling the soil around. Sometimes this is not possible because of buildings or infrastructure for example. The principles to treat the soil can be based on removing the contamination via the groundwater, via soil air or by biological or chemical conversion. By using Excavation as technique the contaminated soil will be removed and taken elsewhere for possible further treatment. Isolation of the contaminated soil are actually only applied, when full recovery of the contaminated soil is estimated as unfeasible. It also can has to do with financial reasons. Isolation is used as method to prevent people from exposure to the contamination, by creating a so called living layer.

The Netherlands is familiar with dredging, it is used to keep the watercourses and waterways clean. It difference if the dredge will be transported, or what will happen to it. On the Maasvlakte for instance, they collect the dredge in a large depot and try to promote it as breeding spot for coastal breeding birds.

For the cleaning of the harbour area the remediation technique of biological conversion will be used, in combination with isolation where necessary. At the moment the most area is paved with a thick layer of asphalt, tiles, ore concrete, so the living layer is already present.

The technique used to remediate the contaminated soil within the Merwevier harbour is called phytoremediation; by using plants, the soil will be cleaned. Phytoremediation itself can also be divided into several techniques: phytoextraction, rhizofiltration, phytostabilization, phytovolatization, and phytodegradation/transformation. In the figure 5.5 these techniques are visualised in schematic images explaining the technique. Rhizofiltration is a technique dealing with contaminated groundwater, which will not be used in the project. The types of phytoremediation techniques used are depended on the present contaminants in the soil. On the next page the techniques that fit the relevant contaminant are listed, together with the associated plants.
5.0 Analysis Merwevierharbour

Fig. 5.5 Plants remediating the listed contaminants
6.0 Spatial Analysis
6.1 The surrounded area in relation to the harbour

In the adjacent map we can see the relation between the project area with its surrounding. The roads, which are creating a boarder in the urban fabric, can be at the same time seen as connection points. The Schiedamseweg, a car road on the dike front with a double bicycle path and tram rails in the middle, creates a passage between the neighbourhood located behind the dike and the Marconistrip. By adding routes and connecting paths on the dike it changes from boarder into access strip.

The new roof park and its shopping mall in the Vierhavenstraat will attract more (shopping) people in the future, these people can be invited into the harbour area, same applies to the tourist attracted by the historical city centre of Schiedam and Delfshaven.

The surrounded area contains a few landmarks. The old mill Nolet, with its 43m it can call itself the highest mill of the world, close by a church is situated. On the other side of the area, in the East, three living towers can be seen from east site of the harbour.

The area is surrounded with public transport, with biggest node the metro station at the Marconiplein.

Unique in this location is the accessibility and visibility from the river Maas.
6.2 Spatial characteristics

Landmarks

From the harbour area a view landmarks are visible from a large part of the area: the old mill Nolet, an old chimney of the Nolet distillery, the cranes along the quays, the Marconitowers, and the chimney of the e.on gasworks.

Long quays

A distinctive and continues phenomenon of the area is the long, straight and high quays running along the water.

View and access from the Maas

Looking back to the bigger analysis where the banks of the Maas are mapped, the project area has the potential to change the present atmosphere where industry is dominant and invite people into the area.
6.3 Spatial analysis

6.2 Spatial characteristics

Marconistrip

Here the Marconistrip, situated next to the Schiedamseweg, where the former railnetwork entered the harbour, is visible, a vast open terrain with view on the Marconitowers.

Vierhavenstraat

The roofpark in the Vierhavenstraat is directed towards the hinter neighbourhouds, so from the project area only the big shopping mall is visible with the car roads in front of it.

Waterinlets

Water is very present in the area. The water inlets from the harbour are enclosed by quays, sheds, and buildings and can be seen as a space in itself.
6.3 Spatial analysis

At the end of the harbours a view over the river Maas opens up.

The current route towards the harbour ends are predictable, they gave an enclosed feeling, and have no connection with the water.
6.3 Spatial characteristics in photographs

To get a better feeling of the spatial qualities of the area the points mentioned above are showed in eight pictures of the area. Here the exact places of these pictures are showed.

1. Mercuriusweg
   The soft quay along the Maas gives a panorama of Rotterdam and the river bank

2. Marconistrip
   The long strip runs towards the Marconi towers and is bordered by the Schiedamseweg on the left and the waterinlets with its quays on the right.

3. The waterinlet along the Marconistrip point with its long quais towards the river Maas.

4. The hard and orthogonal shapes of the harbour emphasise the different shapes of the church and the mill Nolet

5. The old rail tracks leading towards the end of the harbour emphasizing the long and straight direction along the water.

6. The shape of the area, following the waterside, gives multiple views of the area itself, here you look back on the Kelle and Lek harbour, the direction where you came from or heading to.

7. Here the enclosed water space is visible, the end of a harbour inlet.

8. The view at the end of a harbour inlet point towards the river Maas.
6.3 Spatial analysis

1. Mercuriusweg

2. Marconistrip

3. Waterinlet beside Marconistrip

4. View from quay towards church and mill Nolet
6.3 Spatial analysis

5. Quay parallel to Galileistraat

6. View on waterinlets of Keilehaven and Lekhaven and skyline Rotterdam

7. View on end of waterinlet, an encolosed water area

8. View from end of waterinlet towards Maas
6.4 Nature image

At the current location there is virtually no nature to be found. The nature image for the design project will connect to this fact with the idea of smaller ‘nature’ interventions within the bigger open plains. A routing along the open plains will connect these nature interventions. The type of nature will be depended on the program of it, or next to it. Following on the current harbour landscape some places will be ‘given’ to nature, at these places no maintenance is needed. Nature can take over and develop itself over years. Another type of nature, which will be part of the project, is remediation vegetation. The aim is to integrate the remediation of the soil within the design.
7.0 Program Project Area
7.1 Current food debate

The production of local food is an emerging phenomenon. This has to do with several factors. One of them is that our food system is depended on oil. The food we buy in our supermarkets has flown around the whole world. An additional fact is that our energy sources are running down, so in the (far) future we may not be able to ship or fly our food from country to country anymore. At least, not at the same way we are transporting them now. The gasoline, kerosene and other types of fossil fuels used for our transportation are non-renewable resources and at the same time cause the production and use of these fossil fuels environmental concerns.

With the production of local food the transportation distance will be enormously reduced and therefor the environmental effects like CO2 emissions.

Then another subject in our current food debate is the way our food is treated. On the next page a very simplified version of our food chain is showed. It gives an overview of all the steps a product is going before it is located in the supermarket. The treatment of the product already starts in the beginning with the growing of the crops; for instance to increase the yield or the prevent diseases. In the processing phase the products are cleaned with chemicals and provided of additives to longer the lifetime. These treatments do not inure the qualities of the products. Locally produced however, do have good quality. Because of the transport reduction the food is fresh and additives are not necessary. Local foods are seasonal, in this way people are getting more aware of the food they are eating, and the different types of food are better appreciated.

With local food you can look for you self where your food is coming from and how it is treated. This in contrast to (most of) our current food, which remains a big mystery where it coming from, let alone how it is produced.

Another additional benefit of locally grown food is that it provides more farmland and green space in and around the city again.

The other site however of biologic food is that it needs a bigger surface for production.

The debate about our food production leads towards two types of design projects. One is focussing on energy reduction, closed energy loops and large food production, while the other type focuses more on the awareness of food and the social aspects of it on the smaller scale.
THE FOOD CHAIN

Agricultural Production

- Soil Loss
- Polluted Runoff
- Wastewater
- Greenhouse Gasses
- Habitat Loss
- Crop waste

- Crop
- Harvest

Processing Packaging Preservation

- Loss of Nutrients (by added flavourings, preservatives, fillers etc.)
- Packaging waste
- Waste water
- Greenhouse gasses
- Crop waste
- Chemical waste

- Processing Plant
- Packaging Plant

Distribution (Transport)

- VOC Volatile Organic Compound
- CO Carbon monoxide
- CH₄ Hydrocarbons
- CO₂ Carbon dioxide
- Un eaten food
- Packaging waste

- Transport
- Storage

Retailing

- Greenhouse gasses
- Refrigerants
- Packaging
- Water

- Local shops
- Homes

ENERGY

ENERGY WASTE
7.2 Local food production in the project area

Following on the adjastability of the project, urban agriculture is a program which will fit perfectly. It does not require major interventions to build community gardens or to pull them down when necessary. In view of the financial crisis urban agriculture can also be a positive factor, the economic value can not be simply compared to the type of finance flow caused by the exchange of money for radishes or apples in supermarkets, but it can create different approach to life and food, competing with or supplementing the growing organic produce in supermarkets. By letting people grow their own food a different lifestyle is being stimulated, where people change from consumers to producers. In both European and North American literature has been identified that urban food production makes a visible difference to people’s quality of life.

‘food growing projects can act as a focus for the community to come together, generate a sense of ‘can-do’, and also help create a sense of local distinctiveness - a sense that each particular place, however ordinary, is unique and has value.’

Urban food growing activities are also valuable educational resources within schools where children can be introduced with gardening and even science, geography and environmental studies.

Access to fresh locally grown fruit and vegetables means that people can see where, how and when crops are grown, so they will be more aware of what they will eat and make them wander where all our food is coming from.

On the current site of the Merwevierhaven the ‘Voedselbank’ is located, an organisation that distribute left over food from supermarkets and companies to poor people. In the surrounded neighbourhoods is a lot of unemployment and a high density living environment. The introduction of urban food growing in the new plan for the harbour can in this way offer people labour and leisure while producing food for the ‘Voedselbank’ and for retail.
7.3 Different types of food growing within Rotterdam

On the following page a scheme is shown of six different food projects within Rotterdam. Family business ‘Buythenhof ’t Rhoon’, city farm ‘Uit je eigen stad’, restaurant ‘De Kas’ and ‘Villa Augustus’, community garden ‘Tuin aan de Maas’, vegetable gardens in general, and kitchen gardens in general. They change consecutive in scale from large to small.

The family business ‘Buythenhof ’t Rhoon’ has as main goal to produce food and to sell it for money. But in extension to the production of food it has also opened its farm landscape for the public. In this way it aims for educational and recreational goals. Next to this, another goal of the business is helping disabled people.

The main goal of the city farm in Rotterdam is based on an ideological thought, which is basically to bring people closer to its food again and to let people experience the taste of healthy and good food. The company, ruled by three guys, also shows a new way of food production in the city. In this way the three founders of the city farm see the goal of their company as a social assignment, which should get a new and familiar place within the habitat of the human being.

The two restaurants have as main goal of course to serve their customers, but with the vegetables growing around the building, it gives an extra dimension in the experience of the customer’s dinner. The customer can see, before entering the restaurant, the vegetables and herbs growing in the garden that can be later found on their plate. In this way the vegetable gardens have an educational effect and making the customers be more aware of the seasonal effect of the local food production.

The community garden ‘Tuin aan de Maas’ was an initiative of the neighbours themselves. It provides them of a garden and it strengthens the band in the neighbourhood. The neighbours seen the garden as a distraction of their daily live, to find some rest with the production of food as a positive and nice incidental.

This counts also for the vegetable gardens in general, except from the fact that they are only for one owner, so the collective neighbourhood feeling is not as present as in the community garden.

The kitchen gardens, the smallest scale of food production are however mainly focused on the production of vegetables and herbs, but of course for own use, not for retail.

The type of food production for the project area will be a combination of the city farm and the community garden.

Fig. 7.3a The ‘Voedselbank’ in the Merwevierharbour with its logo.
<table>
<thead>
<tr>
<th>Boeren-bedrijf</th>
<th>Uit je eigen stad</th>
<th>De Kas, Villa Augustus</th>
<th>Tuin aan de Maas</th>
<th>diverse</th>
<th>diverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akkers</td>
<td>Restaurant</td>
<td>Restaurant</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Weide</td>
<td>Boerderijwinkel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zorgboerderij</td>
<td>Restaurant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boerderijwinkel</td>
<td>Restaurant</td>
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<td>Theeschenkerij</td>
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<td>Moestuin</td>
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<td>Pluftuin</td>
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<tr>
<td>Boomgaard</td>
<td>'Tunnels'</td>
<td>Boomgaard</td>
<td>Boomgaard</td>
<td></td>
<td></td>
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<tr>
<td>Paddestoelenkweek</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Fig. 7.3b Food related projects at different scales within Rotterdam
7.0 Program project area

7.4 Calculations food surface and production

For the calculation of the amount of food production for a certain surface I used the ‘Food matrix’ of Craig England. In fig. 7.4 an small part of the matrix is visible. It shows per crop the yield in pounds per square feet. In the calculations I assume that one person eats 2 pieces of fruit and 0.2 kg vegetables a day.

Each vegetable has a different weight, so the yield per square feet will differ. To make the calculation more precise I will take 12 different types of (Dutch) vegetables. Of course this is still not very precise, because if I do the same calculations with 12 different types of vegetables the outcomes will be different. But to get an idea what is possible in the project area it is precise enough.

To fulfill the need of 0.2 kg vegetable per day per person, one person needs 73kg vegetables per year. So with 12 vegetables, we need $\frac{73}{12} = 6$ kg per vegetable per year.

The yield per vegetable in kilogram per square meter:

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>kg / m²</th>
<th>m² voor 6kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>asperges</td>
<td>0.36</td>
<td>16.7</td>
</tr>
<tr>
<td>aubergines</td>
<td>2.69</td>
<td>2.2</td>
</tr>
<tr>
<td>bonen</td>
<td>0.86</td>
<td>7</td>
</tr>
<tr>
<td>bieten</td>
<td>1.66</td>
<td>3.6</td>
</tr>
<tr>
<td>broccoli</td>
<td>1.66</td>
<td>3.6</td>
</tr>
<tr>
<td>spruitjes</td>
<td>1.79</td>
<td>3.4</td>
</tr>
<tr>
<td>kool</td>
<td>3.39</td>
<td>1.8</td>
</tr>
<tr>
<td>wortels</td>
<td>3.54</td>
<td>1.7</td>
</tr>
<tr>
<td>bloemkool</td>
<td>1.88</td>
<td>3.2</td>
</tr>
<tr>
<td>selderij</td>
<td>7.85</td>
<td>0.8</td>
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<tr>
<td>suiker:</td>
<td>1.66</td>
<td>3.6</td>
</tr>
<tr>
<td>koolkool</td>
<td>1.92</td>
<td>3.1</td>
</tr>
<tr>
<td>komkoomer</td>
<td>0.36</td>
<td>50.7 m²</td>
</tr>
</tbody>
</table>

So for one person we need - more or less - 50.7 (!) m² already.

Then to fulfill the need of 2 pieces of fruit per person per day, we need 730 pieces of fruits per year. If we assume that we eat one apple and one pear a day, and one tree provides more or less 200 pieces of fruits, we need 2 pear trees and 2 apple trees per person. Fruit tree should be planted with a distance of more or less 6m, so lets say a surface of 6m * 6m = 36m² is necessary.

This result in the final number of 50.7m² + (2*36m²) = 122.7 m²/person/year.

The project area exists of 130ha land. So the area can theoretically produce for 130ha/122.7m² = 10595 persons. This is 1.7% of the 616 528 citizens of Rotterdam. So to aim for a food production for the people of Rotterdam in this area is not realistic.

The Voedselbank delivers 300 packages of food a week, but there is more demand. So a goal for the project is to meet in this extra demand of food.

A package is for one household. So 300 persons collect every week a package containing food for more or less 3 people. From the cbs statistics we know that 1284 households in only two adjacent neighbourhoods are getting payments. This explains the shortage of the 300 packages.

 Lets say that we want to produce food for 1000 extra households. Together with the packages from the Voedselbank this should be more then enough. These are 1000 *3(average household)= 3000 people, which asks for 3000*122.7 m²= 36.81 ha

The program of food production does not only delivers food, it also creates work opportunities for neighbours without a job. If we say that one person can maintain a surface of 200m² of vegetable garden, then there is room for 368100/200=1840 persons to work in a garden.

Next to the production of food there will be also program for retailing of the food, such as a local food shop, a restaurant and cafe’s.
7.5 Program list, activities and target groups

The program for the project area will be connected with the growing of food and will mainly be focused on citizens of Rotterdam and Schiedam. The project however also aims to invite people from other cities into the transformed harbour area to experience a new place within the old harbour landscape along the river Maas. In combination with the restaurants, local shops and lunchrooms the area is suitable for a recreational visit.

Program list:
- 1 market hall
- 2 locale producten winkels
- 1 or 2 restaurants
- 1 lunchcafe
- 3 info pavilions
- 1 workshop/activity centre
- 1 community/gathering space
- room for creative industry
- 1 clear cycling route along the waterside, connecting different program and activity areas.
- Walking areas are connected and accessible from cycling route.
- 37 ha vegetable garden
- 400 fruit trees (apples and pears, more or less 2.0 ha)
- 2-3 greenhouses (900m2)
- 1 seed nursery
- 8 beehives

Activities:
- Gardening
- Eating
- Meeting
- Shopping
- Working
- Playing
- Resting
- Fishing
- Walking
- Cycling
- Swimming

National
- Visitors
- Public
- Accessible
- Activities
- Taste
- Experience
- Relax
- Meet

City
- Public

Neighbourhood
- Workers
- Interaction
- Work opportunities
- Facilities
- Education
- Production
8. DESIGN CONCEPTS
8.0 Design concepts

8.1 Schematic models as starting points

The first model has as most important element to deal with the flooding risk. A new dike is running trough the area, dividing the harbour in two pieces. Result is that the water area behind the dike will be separated from the river Maas and will become stagnant. The dike crossing the straight quays and cut is this way the vista towards the Maas from a large part of the area. The shape of the dike is different from the formal language of the harbour area, and is in contradiction with the idea of the design approach described in chapter 4.

The second model however, underlines the current forms and characteristics of the area. In the model a dominant route emphasizes the existing waterside. This route has the potential to connect with the current developments along the waterside. On the next page this model is shown in relation with the bigger context.

The last model has the program as main starting point. Different program areas, located at a specific place in the harbour area, are in connection with each other by routing. The places for the program are chosen in a way that the routing follows for a large part the waterside, but also uses important building as new functions.

As conceptual model for the design the main shape of the waterfront with the hinterland, model 2, will be further developed, but this will happen in combination with model 1 en 3. So the waterfront has to include a new or improved dike front and should have program areas along its route.
Gras langs water
Bomen
Locatie langs water
Ontwerplocaties
Route langs water
8.2 The shape of the waterfront model

The three images on the right show the route of the waterfront in different ways. Looking at the schematic sections you can see that the last shape brings the most variety. Not only in section, but especially in the experience of this line along the waterside. The route runs along the water, cuts through the harbour ‘fingers’ and also runs over the water ‘inlets’. In this way the spatial characteristics, mentioned in paragraph 6.3, are being emphasized and can be experienced in a new way.
8.3 Main principle of combined models

The combination of the three models, explained in paragraph 8.1, are shown in the scheme at the right. A part of the waterfront will be increased to function as a new dike and prevent Rotterdam and Schiedam from flooding. Because of this higher part running through the route three different types of spaces arise; a smaller space along the waterside, a quay, the space on top of this increased waterfront itself, and a space behind the increased waterfront.

The location of the harbour is close to the North sea, and therefore subject to the tides of the sea. With ebb, the water level in the harbour fluctuates around -0.7m NAP ("Normaal Amsterdams Peil"), with flood, the water level is about +1.5m NAP. The ground level of the harbour has an average of +3.2m NAP. So the distance from the quay to the water with flood is more or less 1.7m.

The current dike has a height average of 4.2m NAP. At first sight this seems high enough, but every 4000 years the river can rise until more or less 3.5 meters NAP. As we have read in the Landscape Analysis, some points in the dike are not strong enough to hold back the water if it is at a high level of for instance 3.5m NAP. The increased waterfront should therefore be strong and for precaution be at least higher than 1m.
8.4 Remediation plan

In the landscape analysis we have seen that the soil is contaminated at certain spots with heavy metals due to the previous industrial functions and in order not to move this problem elsewhere, the contamination will be cleaned by phytoremediation at the location itself.

In fig.8.4a we can find the contaminated locations of the harbour area. To prevent that multiple smaller areas are deposit for remediation, all contaminated soil will be collected at the most contaminated location at former terrain of the old gas factory and steel factory. (fig.8.4b)

Off course a much more comprehensive soil research is necessary in order to know the exact locations, types, and amount of contamination. But for the principle of the remediation plan it is not of big influence if the contamination is slightly more or less, or located some meters further right or left.

To be sure all contamination will be gone from the harbour area I will remove a layer of 2,2 meters of the top soil (most contamination is situated in a layer of 1 meter deep, but there are also heavy metals found at a depth of 1.7 meter).

In the first phase of the remediation process, so when the seeds are just planted and the first plants are starting to grow, people are not allowed to enter the area in connection with heath risks. To prevent a large fence around the area, a dike will function as fence. In this way it functions as natural boarder, and in a later phase the area can made accessible by cutting the dike, or at stairs.

The reason why the contaminated area is divided in two areas, is that in the middle part buildings from the old 'Ferro' factory are located. These buildings will be adapted and renovated for new functions. This part of the area is already paved, in this way the contamination does not constitute a risk, because the layer of asphalt and concrete acts as isolation from the contaminated soil.

The inner part of the two enclosed, oval shaped dikes, which is not accessible in the first phasing for people, can be constructed from a part of all the collected contaminated soil itself.

The total surface of contaminated soil is 94.621 m² (80.198 + 14.423, see fig. 8.4b) times 2.2m = 208.166 m³. With a dike of 2m high, both the dikes will have a volume of more or less 70.000m³. This will create a surplus of 208.166-70.000 = 138.166 m³

With a total surface of 136.574 m² within the dike areas the surplus will cause an extra layer of (more or less) 1m contaminated soil. In order to make these inner dike areas more interesting and to save time and cost the surplus of the collected contaminated soil does not have to be spread out over the surface properly, the excavator can dumb the soil randomly on the surface. In this way, small hills inside these dike areas will arise and can be use for recreational function in a later phase for this ‘remediation park’.

Another advantage of this concept is that it also can be used in the future, when more contaminated soil need to be cleaned, for instance for the realization of new housing blocks. In this way the hills slowly will grow bigger.
8.0 Design concepts

8.5 Different types of places within the waterfront

The harbour area is not a part of the urban fabric, so ‘the connection with the city’ (the black arrow) will be an important element. There are however already some starting points to rely on. The black arrows at the Schiedamseweg are placed on existing stairs and walkways connecting the neighbourhood with the upper part of the dike. So with stairs or walkways from the Marconistrip towards the upper part of the dike, the area becomes accessible from the underlying neighbourhood. The new Dakpark at the Vierhavenstraat is also a starting point to connect with. By making an open and inviting border at the Vierhavenstraat, people from the Dakpark or shopping mall underneath it can walk into the harbour area.

Within this scheme the spatial characteristics are adopted. The blue lines emphasize the straight quays directing you towards the ends of the ‘harbour fingers’ along the waterside. The orange space will focus on the panoramic view over the river Maas, while the space at the orange lines have buildings on both sides of them, so at the end of these line the view and experience over the river comes as a surprise.

The lighter blue areas will let people experience the feeling of the river, and make the distance between the water and the people literally closer. The tides will be noticeable and the water can be touched.

The red arrows show that there will be a connection between the important building areas (the Marconi towers and the buildings of the e-on gas factory) and the waterfront. This will also increase the accessibility of the waterfront. People will be led from the buildings, which will be occupied in the future with new functions, in a logic way towards the water.

The orange and the green arrow direct from the waterfront towards the hinterland. This means that the hinterland will be in connection with the increased waterfront, and be treated as a separate part. This connection will be stronger because of the circular shape of the ‘harbour heads’, so this hinterland area will be seen from three different directions, following the route along the waterfront.
8.0 Design concepts

8.6 Urban morphology and entrances of waterfront

The area behind the increased waterfront, the hinterland, will be based on the existing urban morphology. In this way existing roads, buildings and terrain-shapes can be reused for new functions and forms, so an new and strong identity will be created, only with little intervention.

Fig. 8.6a shows with the red lines the existing routes around the area, the arrows indicate the locations where to connect with the new waterfront to increase the accessibility of the waterside. The patterns in the hinterland, based on the existing structures, also form spatial starting points for future area developments.

So in the masterplan these shapes will be present to determine the spatial interventions in the future.

The new dikefront joins with the existing dikefront at the Havendijk in the Southwest, at the Schiedamseweg and runs towards the new dike in the Dakpark. (Fig. 8.6b)

The join at the Havendijk will extend the Buitenhavenweg, a road along the water, the mill Nolet, the new distillery, and old distillery buildings.

At the moment the Europan has organised a competition for the Vrom/Koemarkt at the beginning of the Buitenhavenweg, with realizations as reward. So this road has a lot of potential to develop very fast, and in this way become a perfect occasion as entree of the new waterfront.

The Schiedamseweg is running parallel from the Marconistrip, close to the water of the harbour. Creating an extra dike in front of it creates an unpleasant space in between the two dikefronts and will prevent connection with the harbour or with the underlying neighbourhood. Therefor the existing dike of the Schiedamseweg will be improved in a way it will connect with and protect from the water.

Following from the concept that people should be led from important buildings or building-clusters towards the waterside, a new entrance adjacent to the terrain of the e-on gas factory is introduced, opening up to the waterfront with an exaggerated entrance giving the impression of a gate.

The last entrance of the waterfront exists of multiple accesses, as can be seen in Fig. 8.6a. People can enter from the whole length of the Vierhavenstraat, but one access however will attract the attention; the increased waterfront can not be joined with the Dakpark dike, because of the infrastructural function of the Vierhavenstraat, so the new dikefront will have its beginning (or ending, depends on what you direction is) on the Vierhavenstraat. Besides this is the only official access point to enter the new waterfront by car. Of course some of the existing roads can still be used.

The focus point for the new waterfront however park is for slow traffic, so biking, walking, running, skating etc., but for functional reasons of the added program accessibility with the car will be necessary.
8.7 Tides, ground level height and flooding risk

In the section we can see an overview of the water levels and ground level again. With heavy rainfall, the water level of the river Maas will rise until a level of about 3.0m NAP. For the harbour area this will not cause any risk. Once every 100 year however, the water level reaches a value of about 3.26m NAP. At certain areas this may somewhat give problems at certain spots, because of there ground level height.

A consequence of the excavated areas for collecting the contaminated soil, is that the ground level of these areas lower with 2.2 meter, and will be at 1.0m NAP. With high tide these areas, provided that they are located next to the water, will be flooded. This creates the opportunity to transform these areas in small wetlands, where people can walk trough and in this way get a new experience in the harbour area. The fluctuating tides will also let people notice that one moment the area is under water, and the other moment the water will be disappeared.

The two later damaged harbour inlets, the Keilehaven and the Lekhaven, have a slightly lower ground level: probably because of this later damming up. To prevent problems of flooding these areas will be used (already showed in fig. 8.5) as areas where people can get in closer contact with the water and the tides.

Then one last thing as regards flooding risk, the new waterfront will be open at three locations (see fig. 8.7), and can cause problems in the future at two of these locations. At the middle opening, located above the e-on gas factory terrain, the ground level has a value of 3.6m NAP, which prevents the water from breaking trough the area behind the new dikefront. The other to openings in the new dikefront are very close to the existing dikefront, where of one is the just realized Dakpark in the Vierhavenstraat, which means that risk that the water will break trough this second dikefront is not that high. However, it calls for some further technical research.
Masterplan Scale 1:5000
9.1 Masterplan and its Layers

On the previous page the Masterplan is showed. Here all the design concepts come together in one plan: a continuous route along the waterside, a new dikefront, the excavation and collection of contaminated soil, different types along the waterfront, based on the existing surroundings, the use of the current urban morphology, the introduction of entrances towards the continuous waterfront, and the integration of flooded or excavated areas along the waterfront.

In order to understand the Masterplan and its content I will pull different layers apart and will discuss them as separate subjects. The layers consist of the new dikefront, the new program, the new habitat for the harbour area, and the new circulation.
9.2.1 New Dike front

(To explain the dikefront I will ‘start’ in the South west, and will follow the waterside until the end of the new dikefront at the Vierhavenstraat in the East)

The new dike front, starting from the beginning in the West, joins with the Havendijk in Schiedam and is an extension of the Buitenhavenweg, running along the Schiedamse Schie. When entering the dike you will slightly notice the height difference of one meter, going up. The dike is a grass dike with not very steep slopes, so by the addition of stairs the dike can be crossed from the hinterland towards the waterside. Here the dike has a natural character to relate with the adjacent Maasboulevard Park. Where the waterside is turning in the Northern direction, the dike will become steeper with bicycle slopes on both sides, to stronger the relation with the hinterland, assuming that the hinterland will be further developed in the future. Then the side facing the water becomes a vertical wall of hard material so the character of a smaller quay arises. The dike ends at the Marconistrip in the North, but instead of joining with the Schiedamseweg the dikes stops in front of it, in order to create an access and entree to the Marconistrip. The following part of the dike, the middle and Northern area, is an improvement of the current Schiedamseweg. The cycling path on the dike will be increased by one meter and will have a very non steep slope running in the direction of the water.

Above the e-on terrain the dike is cut again, in order to create an entrance from the other side of the area. Here also a transformation in the appearance of the dike takes place; the side facing the hinterland still has a natural character, while the side facing the water will act like a wall, so the long spatial areas are getting stronger and the strong identity of rusted steel, which will be used for a large part as dike wall, gives a rough and strong feeling for this part of the area. At the most southest point the whole ground level is lifted in order to make the experience of the panoramic view even a bigger happening. Thereafter the dike turns it back to the Maas and heads to the Vierhavenstraat. On this last part the dikefront of the remediation park is joined, creating two enclosed surfaces for the collection of the contaminated soil.
2. Bike ramp with industrial relics

4. Sculptural square at location of excavation from contaminated soil. Concrete wall functions as dike.
3. Grass hill with vegetable gardens at Marconistrip

5. Used sheet piling functions as new dike.
9.2.2 New Program - 1. program and activities

The main program activity, which will take place in this harbour area, is food growing and everything that comes with it. Existing buildings in the Marconistrip will be renovated to function as tool shed, mushroom farm, greenhouse, and Foods shop with cafe. The buildings at the cultural areas will function as restaurant, art distribution, information pavilion and watching tower. Except for the watching tower, these buildings are adapted or renovated buildings.

Next to the food growing activities and program, the area will also invite other activities, such as cycling, walking, wandering, running, skating, kiting, resting, fishing, or canoeing. In combination with its unique location along the Maas, the innovative transformation of an old harbour site and the program of food growing within this harbour site, the area will attract people not only from the surrounded neighbourhoods, but also from the city of Schiedam and Rotterdam, and even aims to attract visitors from other cities within the Netherlands.
9.2.2 New Program - 2. principle of urban food growing

The principle of the food production on the site will be based on a closed circulation. In one of the existing buildings, next to the current Voedselbank, a seed nursery will be located. Here the seeds for the vegetables will be cultured and collected. People who will work in the gardens can pick up their seeds for their garden at this location, and they will be provided with information about the relevant crops: when to put the seed in the ground, when to harvest it, and how to take care of it.

In each garden area a tool-shed can be found where all the tools necessary for gardening can be stored. These tool-sheds, dependent on the location of the gardens, will be situated in old buildings of the harbour, or are made of old containers, used for cargo storage. Every garden area also had a compost heap, which can be used in a later stadium as fertile soil.

Once the crops can be harvest, the can be sold in the Food shop, used in the Restaurant, or taken home for own consumption, depended on how big the harvest is.
9.2.2 New Program - 3. Two design principles for the vegetable gardens

Here two areas of gardens are developed to explain the design principles. In area A the existing structure of roads and buildings create a rectangular pattern, which will be emphasized with the shape of the garden plots. The design principle for one plot is based on the inversion of these rectangular shapes, they are directed inwards, leading you the centre of the plot. In this way smaller spaces arise within the rough and large harbour landscape. This also counts for the gardens in area B, except that the spatial direction is not focused inwards, but in linear direction towards the enclosed dikefront of the Remediation Park.

The spatial focuses will be realised by beech hedges with heights alternating from 0.4m, 3.0m and as highest 5.0m. In every plot a central point can be found following the spatial direction of the hedges. Here the tool-container can be found, and smaller spot for resting, gathering, and meeting.
The garden plots are surrounded by small orchard. The tall hedges leading people from the gardens into these orchards, where people can walk through to cross the dike and to walk along the waterside. Existing road are kept to reach the gardens, they are cut by the new dikefront and therefore will only be used by people working in the garden, or visitors who want to stroll between the fruit trees. The garden plots will have a clear boarder of shrubs, to close them off from the road and sheds, still used by different industrial business. But the idea of a clear boarder is also created in view of the future. When for instance new housing blocks will develop in this area, the strong form of the existing morphology will keep intact, and also the grass fields with the garden plots on them.

The section makes clear how the high beech hedges enclose the people inside them and really lead you towards the center of the plot, or leading you outside the garden plot.
9.0 Design
This garden plot is located directly on the dike of the Remediation Park, where a walking path crosses the dike, leading you in the Park. To integrate this large dike of the Remediation Park with the gardens, the high hedges running all the way to the upper part of the dike, allowing people to enter the Park from different points. The spatial effect of the dike, the high hedges, the enclosed spaces, and the linear form evokes a certain playful character, despite that it seems to be a very strict and tight design at the first glance.

In the section the tool-container is visible, as for the enclosed walking path in between the hedges, the smaller hedges to divide the gardens, and off course to give some protection from the wind, and the meeting and resting spots along the paths.

The paved areas in between the garden plots (more visible at the birds eye on the next page) are existing surfaces. The plots are located on former industrial sheds and follow the contours of its foundations.
Birdseye from the garden plot and orchards along the Maas, separated by the new dikefront in between them. You can see how the enclosed path leading people to the centre of the plot, and when you walk further they bring you in the orchards of pear trees.

Birdseye from the garden plot adjacent to the Remediation Park. The cycling path on the dike runs paralles to the cycling path connecting the garden plots, while the direction of the vegetable gardens and the hedges follow the direction of the Remediation Park to make them part of each other. The lines of fruit trees accentuate and strenghen these direction.
9.2.3 New Habitat

The layer of the New Habitat can be divided into four parts: the Nature Islands, the Remediation Park, the Wetland and the Tidal zoning.

The two 'harbour fingers' connected to the Marconistrip will be detached from the waterfront and become islands. To come back to the nature images I described in paragraph 6.4, these islands will be the type of area where nature can take over. In order to stimulate natural processes, also in view of the water quality and the habitat in it, the protection walls from the quay will be partly removed. The tides, the water flows and the wind will transform the quays slowly in natural banks. The industrial buildings at the islands will slowly get overgrown by plants, and will function as new home for bats. The islands are accessible from small bridges in connection with the Marconistrip, and from the water via little piers where people can moor with their canoe.

The slow nature developments emphasize that the area always be subject to change and transformation. It also symbolizes the idea that one small intervention can evoke large transformations in the future. In this case the removing of the quay protection. In my design project the introduction of a continues waterfront is the small intervention, evoking all kinds of developments in the future.

We have already seen in the design for the gardens that the Remediation Park is accessible by an opening in the dikefront. This opening however, will be made after more or less 5 years, when the trees and plants, which are going to remediate the soil, had some time to root and grow, and when the annuals already took out a part of the contamination. Then cuts in the dike will be made and stairs on the dike will be added, so people can explore the evolving Park area on the other side of the dike.

The Wetland, originated by the excavation of contaminated soil, can be experienced by strawling over wooden walkways, discovering small flonders in between high reeds. In order to realize a wetland, a layer of nutritious soil will be added, so waterplants and reeds can grow. A long wooden pier breaks the waves so the plants will have a change to root and grow. The area is situated in the transition area of salt water from the sea to sweet water from the river, this can create interesting plant developments within the wetland. The water will have a maximum depth of half a meter, so, especially when ebb is coming, the area can be a great place for children to play in.

The two tidal areas will have the less 'natural' appearance. Large concrete stairs will be under water with high tide, and will appear again with low tide, where strips of waterplants divide the wide steps from the stairs.
9.0 Design

1. Current situation, with new dike.

2. Excavation contaminated soil, and adjusting quay protection.

3. Long and shallow bank, stays wet trough tides. Reeds and waterplant will grow over time.

Phase 1. Collected contaminated soil is shaped in the right shape.

Phase 2. After sowing the related seeds the first plants will grown.

Phase 3. Some years later the area is filled with mixed vegetation.

Evolution Remediation Park

Evolution Wetland

Section trough the Wetland
9.2.4 New Circulation

The new circulation of the Masterplan exists of three different kinds of paths: a pedestrian path, a bicycle path, and a car-road. The types of movements of these paths are different, as well as the modes of perception.

The main cycling path is situated on top of the new dikefront and creates a route along the water, but with an overview over the hinterland. Because of the looping shape of the waterfront you have an overview of where you are heading to, and where you are coming from. Following the path, you are cycling in between two different worlds; on the one hand people are putting crops in the soil, surrounded by fragrant and colouring fruit trees, pollinated by bees, while on the other hand the railways, cranes, bollards and paved quays remind you on the former industrial activities that have taken place in this area.

When you are walking on the quay along the water with the dike wall next to you, the tops of the fruit trees are rising above the dikefront, adding a special atmosphere to your experience of the area. This works vice versa when working in your garden; the cranes, pipes and industrial buildings rising above the dike, leave a great impression, making you conscious of the spirit of the place.

The pedestrian paths are not marked everywhere. Along the quays the former pavement of concrete stones will function as walking paths, this also applies for the spaces in between the garden plots, as we have seen in the designs for the gardens.

By not marking every route in the waterfront park, the area evokes people to explore a route of their own. The paths that are marked have the function to connect the waterfront with the existing surrounding, and in this way making the waterfront accessible, and also to make a clear spatial structure which can be use as basic starting points for future developments.

Within the Remediation Park there is also no clear routing, so it really stimulates people to explore for themselves. In the Wetland on the other hand, wooden walkways leading people trough the high reeds, towards resting places, showing vistas, and creating playing opportunities.
The new dikefront is a clear and present linear landscape element, following the quays of the harbour, cutting off two harbour fingers, and adapts in form and appearance to adjust to the existing locations. The mode of perception, cycling over the dikefront, will be focused on vistas, and overlooking the area. The detailing of the cycling path is therefore minimal; the form of the dikefront itself is enough to clarify the routing.

In the garden areas, and the Wetland multiple walking paths are created, so a clear and obvious route is lacking. This stimulates people to be more creative and find a route for themselves.

While wandering through the area in between the vegetables and the fruit trees, people will be more aware of the inhumane scale of the old harbour. The dikefront blocks the view of the horizon while wandering through the hinterland, but in the same time this blocking effect triggers you to climb the dike and see for yourself what is behind it. Overviewing the area you will notice how big the area actually is and makes you aware of the contrasts in scale of industrial activities and human activities.

The pathways running towards the new waterfront join with the dikefront, intersect with it to create openings towards the waterfront, or are integrated with it so the dikefront becomes a routing itself. The form and direction of the new circulation in the harbour area is chosen in a way is follows existing shapes and structures and strengthens the spatial qualities. In this way the spirit of the place will live on in the future.

In figure 9.2.4a a route is defined starting from the Buitenhavenweg in Schiedam, ending in the Vierhavenstraat of Rotterdam. On the next page three-dimensional scenes are showed following this route. The scenes give you a bit an idea what different types of sceneries appearing to you, cycling along the waterfront over the dike. These scenes are based on the starting points for the design, and aroused from the scheme in figure 8.5, the different types of places along the new waterfront.

Figure 9.2.4b shows the location where images are made (to be found on the following pages) to give an impression of the different places within the waterfront experienced from a pedestrian.
Starting at the extension of the Buitenhavenweg....

...leaving the dikefront...

...10 minutes later... halfway...

...3.2 km left...

...people sitting in the grass...

...stairs connecting neighborhood...

...Marconitowers on the end...

...deepened square trough contaminated soil excavation...

...approaching the dikefront again...

...where we have an overview of our route again....

...and the gardens and orchards are visible....

...we cycle farther towards the watching tower at the end....

...in the distance the Remediation Park appearce...

...but first we passing along the Wetland...

...some cars are passing...

...Remediation Park on the left...

...Vierhavenstraat in sight, the dikefront slopes down...
1. Buitenhaven Park

A small path runs along the water, giving a view over the Maas in the direction of the centre of Rotterdam and the RDM-terrain on the other side of the river. On the background on the left we see the grass dike with cyclists on top, heading towards the recreational pier area, before turning towards the Marconistrip. In the distance we see the Marconi towers and the old chimney of the e-on gas factory.

The current area was already unpaved, so the interventions at this location are the pedestrian paths, the trees, and the flowers. The name is inspired on the future developments that will take place on the Buitenhavenweg, this park area lies in line with the road and stimulates a connection with it in the future.
2. Marconistrip

A natural bank already evolved here at one of the nature islands, cut loose from the Marconistrip. The bridge connecting the island with the quay is not clearly visible in this image. The Marconi towers on the other hand are dominant present at the end of the strip. The row of pear trees running parallel on the Schiedamsweg. The improved dike of the Schiedamseweg, the really low grass hill, is visible in the distance, sloping all the way down until one of the renovated old buildings, which functions in the meantime as cafe and food shop, with view on the nature island. The existing pavement and quay function as boulevard, to walk along the vegetable gardens, the food shop, greenhouses, mushroom farms, and the restaurant at the end. We can see the minimal detailing, indicating the cycling path.
3. Excavated square

Because of the contaminated soil, a deepened square arises, sealed with Stelcon plates collected from the area. The square will function as outdoor exhibition space, where the artist Joep van Lieshout, who has his atelier along the Keileweg, can give an opening on the square. Because of this excavation, the large quay, designed for cargo storage will become smaller and will function as cycle and pedestrian surface. In the background we can see one of the entrances where the dikefront is cut and connects the waterfront with the hinterland. Walking through this entrance, the square is accessible by a large and flat stairs.
4. Quay with sheet-piling

For this quay, very little interventions are made. Used sheet pilings will function as dike wall, to increase the rough atmosphere and strengthen the identity of the waterfront. The dikefront, running through the large surface, originally used for cargo storage, breaks through the large scale, creating a small zoning for pedestrians. The end of the waterfront zone is marked by a group of trees. Here a stairs makes the dikefront accessible for pedestrians and offers a panorama over the skyline of Rotterdam centre in the East and Rotterdam harbour in the West. Former train rails emphasize the long and straight direction of the quay, dividing the waterfront in different zonings. The watching tower, situated at the end of the increased waterfront, rises above the sheet-piling wall, triggering people to find the stairs at the end of the waterfront in order to climb into the watching tower and enjoy the beautiful view.
9.3 Materialisation

The materialisation of the new Waterfront Park is based on the principle of minimal intervention. When trees are added on a paved surface, only a part of the pavement, necessary for the tree to root and grow, will be removed. In this way the smaller surfaces of unpaved soil create a pattern, varying depending on the spatial layout of the trees.

The indication of the cycling paths on the existing paved surfaces along the waterside is discussed earlier; in image 9.3b the detailing is made visible. Two steel strips, with integrated light spots, mark the area where people can cycle. The steel strips refer to the former railways running through the harbour area. This type of cycling path will be used on the Marconistrip, as connection and transition of the cycling path on top of the new dikefront, and on the cycling paths starting from the Vierhavenstraat, leading people towards the Waterfront Park.

Old cargo containers will be transformed to function as tool sheds for the gardens.

IPE-profiles will be cut and recoated in order to function as bench; same will be done with some of the bollards in the area. The bollards along the quays will be kept in tact to mark the long and straight waterline.
9.4 Pavilions

Some of the former industrial sheds will be stripped until only the steel construction is left. In this images two examples are showed how these construction can be used: as swings, made from car tires, at the location where the tides are made visible by large concrete stairs. The other image shows the former silos of the e-on gas factory. The pedestrian path connecting the Vierhavenstraat with the Remediation Park runs right trough it. In this way the enormous scale of the former silo’s can be experienced from inside. It can also be used as setting for art performances.

The stripped buildings symbolize the transformation of the area and show the constant change of it. The realisation of the Masterplan will happen in phases, and will also react on people, activities, businesses, actors and initiatives the area will attract. The transformation will be interactive and involve different kinds of people and actors.

The Masterplan leaves a lot room for creative ideas from citizens, it even stimulates this creative thinking. The idea is that the Masterplan gives the initiate for further development. How this will happen cannot be told, but in the future vision at the end of this paper suggestion is made how this area can develop itself.
9.5 Trees within Rotterdam

In Rotterdam the infrastructural network, the buildings, and the paved surfaces are dominant in their appearance. When we take a closer look outside the city centre of Rotterdam we can find some large lanes and singles, accentuated by stately lines of trees. The planar tree has a dominant appearance, and seems to be the most presented tree kind of Rotterdam. This tree kind with the highest number of trees within Rotterdam is however the discrete lime tree.

Before the bombing of the war the elm tree was the characteristic tree kind of Rotterdam. Elm trees can stand a lot of sea wind and can still grow well in a dynamic and urban surrounding. Not only the bombing, but also the elm-disease causes the tree to decline. At the Noordereiland some old elm trees are still standing.

Within my design project I want to introduce the Elm again to become the characteristic tree kind of the harbour city Rotterdam. With its wide and down hanging branches, the tree gives good protection from the Western wind in the harbour area.
9.6 Trees within Masterplan

Here we can see the tree plan. The new Elm trees are situated along the Vierhavenstraat, and running in lines from the Vierhavenstraat towards the Maas, accentuating the linear shape of the ‘harbour fingers’. The spatial structure arising with these rows of trees will be starting point for developments in the future.

Birch trees will be planted on the nature island, because they can easily grow on less nutritious soil. The idea is just to plant a few, and see what types of seeds the wind will take to this islands.

The pear and apple tree will be the main type of fruit tree, at special location such as the gathering points within the gardens, a different type of fruit tree can be found such as cherry trees or plum trees.

The boarder of the garden plots in the West (the garden plots in the East have dikes and existing paved surfaces as boarder) will be marked by Hawthorn.
9.0 Design

9.7 Construction phases

The construction of the Waterfront Park will happen in phases. The phases are explained with the images on this page and the next one. After the demolishing of old industrial buildings, removal of paved surfaces, and excavation and collecting contaminated soil, the new dikefront can be constructed. In order to make the dikefront and the hereby created waterfront accessible the new circulation system (explained in paragraph 9.2.4) will be introduced. As last step to finish this masterplan the New Program will be added.

For such a large area these are not so many interventions for a total transformation. The idea however, is that this masterplan will evoke lots of other developments in order to transform the harbour area further. It is actually a cheap strategy to bring new life in this derelict harbour area.

How the area will further develop itself will be discussed in the next paragraph with a future vision.
4. Excavation and collection of contaminated soil

5. Construction of New Dikefront with the dikes of the Remediation Park attached to it

6. Pioneer vegetation, new paving and construction of New Circulation

7. Introduction of the New Program: vegetable gardens, toolsheds, restaurant, cafe, food shop, art distribution, pavilions
9.0 Design

The Waterfront Park can be seen as part of an urban strategy, a relative cheap one if you compare what goes in with what comes out. We have just seen what is necessary in order to create the Waterfront Park in the seven construction phases. Now I will give an indication of the future developments, evoked by the Masterplan. Of course this are speculations, you never know what will happen tomorrow, but based on the analysis and research of the area on the larger and the smaller scale, and with the financial crisis in mind, the speculation will be close to a realistic future vision.

What will emerge as result of the intervention in the harbour area can be subdivided under three different scales; the larger scale of Rotterdam and Schiedam, the scale of the surrounding, and the smaller scale of the area itself.

The new plan will stimulate a continuous connection between the different waterfronts areas on the Northern side of the Maas. It can also act as showcase of how to deal with the large scale of the harbour, to keep it, but in the same time break trough it, in contradiction with the design for Leuvehooïd and Westerkade. At some locations the infrastructural network is dominant in its presence and the interventions in order to create a new waterfront are bigger. The continuous waterfront has a lot of potential to develop itself to the West. The harbour area of Schiedam is located in that direction, and it also starts to have problems of wasted and derelict land.

9.8 Future vision

The Waterfront Park can be seen as part of an urban strategy, a relative cheap one if you compare what goes in with what comes out. We have just seen what is necessary in order to create the Waterfront Park in the seven construction phases. Now I will give an indication of the future developments, evoked by the Masterplan. Of course this are speculations, you never know what will happen tomorrow, but based on the analysis and research of the area on the larger and the smaller scale, and with the financial crisis in mind, the speculation will be close to a realistic future vision.

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Fig. 9.8a Reaction large scale: continuous waterfront along the river
9.0 Design

The structure of the new path system, leading people towards the entrances of the waterfront, will have a great influence on the relation with the adjacent neighbourhoods. The area can be used as rest-point, away from their dense housing blocks. The harbour area is good to be reached and can function as the backyard of the surrounded neighbourhoods. Not only the spatial structure will attract neighbours, also the program of the gardening will provide people of their own or a collective piece of green space. The green structure of the masterplan can be seen as starting point to extend towards the surrounding. The vegetation of the Schiedamseweg for instance, can be extended towards the historical centre of Schiedam.

Then the last scale, the reaction on the area itself, is in the same time the most complex one. This has to do with several aspects. One of these aspects is that the future developments can happen in high speed, but they can also evolve slowly, depended on economical and political aspects. It is very likely that in the area living houses will be developed. This will first happen in the West of the harbour area, so at the side of Schiedam, at this location a lot of small businesses are located and the area asks for renewal. The focus of this area will lie on the potential Buitenhavenweg, already visited by lots of tourist to see the old Nolet distillery factory.

As second, or at the same time, the area of the Ijsselhaven and the Lekhaven in the East can develop a high qualitative living area along the watersides based on the spatial structure laid down by the rows of Elms. In order to keep the area open for the public, the ground level of the housing blocks will be provided with a public function. When there is however still demand for more housing, or maybe for a different type of housing, the areas within the gardens can be used as living plots. The different spatial structure already asks for a different type of living house, situated just behind the dikefront. It can be an option that here high living towers will arise, so the apartments look out over the river, and the surface plot of the buildings can kept small, adjusted to the pattern of the garden plots.

As for the activities in the area, marked in the plan with brown dots, they will slowly develop as little projects on its own. When for instance the canoe renting place on the recreational pier with water taxi stop becomes a success, logically more activities and function will be attracted to this place, a small food house, or water cycling renting for instance.

Another project which will start develop on its own is the introduction of a creative industry. Architectural offices, small entrepreneurs, graphical designer, artists, musicians etc. will be attracted by the identity and character of the plan and can situate their office or firm in a renovated or adapted industrial building. Interesting buildings for these kinds of functions are clustered at the former e-on factory terrain, the adjacent Ferro-factory terrain and a small part on the Keilehaven, marked with the orange surface. The Marconi towers and its adjacent surrounding will be suitable as work area. The new program will attract more visitors and stimulates more activities, so new life will be brought into the area.
10. Conclusions

10.1 Evaluation

Due to several reasons I changed the theme of the studio, New Energy Landscapes, into a new theme: Post-Industrial Landscapes. The theme actually followed out of the first site researches, and the location of the project itself comes from the fact that the site itself will become a problem for Rotterdam, if a plan will not be made, next to the fact that the site has a lot of potentials to serve as an important and qualitative place for the city of Rotterdam.

Today we find more and more derelict industrial wastelands in and around our cities, as a result of our current and former land use. These particular landscapes are often disadvantageous to the economy, the environmental value is very low, and the site does not have any connection with its social environment. There are already examples of strategies to redevelop post-industrial land, most strategies however, having a general approach and the projects are therefor same looking. Until so far there are only few projects showing the real potentials of brownfield sites, this graduation project also aims to apply a different approach in order to show the potentials of the former harbour landscape in the city of Rotterdam and how to deal with existing industrial landscape in order to find and show the spirit of the place.

In the thesis I described the method of Alexandre Chemetoff, where the interactivity with neighbours, citizens and other parties play an important role in the creation of the masterplan. This is something that cannot be performed in a virtual design project. This also applies for the step-by-step interventions made on the area. The masterplan is a dynamic one, reacting on current demands and interactivity between buildings and public space.

To deal with this in the project I leave a lot room for further developments, but in a way that the spatial structure is already determined. The future vision at the end acts as an example of how the area will develop and how the new waterfront park reacts on this, as an urban strategy for the area.

The approaches applied within the projects that did show the potentials of a brownfield site and dealt with it in a sustainable, environmental friendly, economically feasible, and social way, are based on processes and layering.

The design is complex, many stories are told at one location, different processes evolve next to each other in their own time, routes can be walked in various ways, program spreads over the area. To make all this clear the method of layering brings an overview.

In the thesis paper I quoted some lines of Anita Berrizbeitia that she wrote in her essay 're-placing process' about how this different approach can be tackled.

The analysis and starting points are based on these points described by Berrizbeitia. The main shapes of the design are the result of spatial and landscape analysis, and site research and do not ask for many large interventions. The main intervention, the construction of the new dikefront, emphasises at the same the spatial qualities, and by adapting its appearance based on its surrounding the dikefront also strengthens the identity of the place.

Second point of Berrizbeitia focuses on the need for more site research. Mapping what is already there is for an old industrial site not enough to understand how the area has evolved and what the soil for instance consists of. Through intensive site research in the Merwevierhaven the toxicity of the soil for instance, on lots of places came to light. The findings developed from the site research create a better understanding for the area, now for instance to connect with the surrounding neighbourhoods, spatially but also socially and on an economic level.

With the landscape analysis the thesis approach reacts on the third point, where the history is understood as a process itself. The natural history of the site and its different functions has served helps to find the genius logi of a place, what makes a place unique. The last understanding for process-based approach is that the intervention of this waterfront in the Merwevierhaven is ‘only one of many in the immense evolutionary process of the landscape.’ That is why the project does not try to look for a final form for the whole project area, but rather tries to be adaptive for new program, events or unexpected changes.

The urban strategy made dealing with future developments, such as new program or events are also a tool to check if the design can respond to these changes. It stays very abstract, but it does give an idea.

The relation with the wider social environment, as final topic of this reflection, is practically missing in the current situation of the old harbour site. The intention of the place was off course never meant to relate on a social level, it was purely functional to store and transit cargo. This does not mean that this site is not suitable for adaption to its surrounding. The urban fabric however does not make it easy, but in the design a way is found to connect spatially to its surrounding. A result from the analysis in the larger scale was that the surrounding neighbourhoods have a bit of a reputation as ‘problem areas’, not officially, but they need some improvements. The added program in the waterfront park offers a combination of leisure and work. People without homes or without a job are stimulated to work in the vegetable gardens of the park, in order to grow their own food, and eventually make money out of it. This can also be seen as
an extended version of the 'voedselbank', currently situated in the project area. The surrounding districts also have a lack of gardens and even of public green space. The principle of food growing gives people the feeling of a shared garden and brings them closer to each other. The waterfront park offers a diverse routing along the waterside, creates room for meeting and gathering, and invites people to stroll along the different quays of the Maas.

10.2 Discussion of Research Questions

The final Masterplan for this project cannot give an answer to the main research question, the whole process of creating and developing should be taken into account. How the analysis is made and the research is done can act like an example for other harbour areas that need to be transformed. The focus lies on small interventions at the right places, finding the singularity of this places and make them visible or tangible.

The problem of flooding of the area is solved (or reduced) with the introduction of a new dikefront, which is not a loose landscape element, but it is the basic element for the public waterfront, in fact, it creates the waterfront. This integration of dealing with the problem of flooding risk together with the public space, makes the identity of the public space stronger, and is directly connected with the character of the area, located along the water. This integration happens also at the problem of the contaminated soil, the remediation plan becomes part of the Masterplan, transforming itself into a public park.

The slow growing and adaption of the plants symbolizes the constant change and adaption of the area. The nature islands emphasize this low dynamic process.

Let people experience the large scale of the harbour, by leading them through this smaller interventions, where the human scale is present. The route created along the waterside emphasizes on this large scale, you are experiencing it, while cycling, but still from a distant perception mode. When parking your bike at a spot you feel attracted at, you can further explore this large scale, present in the character of the area, from a closer and different perception mode. Old industrial relics make this feeling stronger. The route emphasizes the characteristics by varying of height different. When cycling on ground level, you have a view at an eye-height you are used at, but when the route runs towards the top of the dikefront, all of a sudden the horizon moves and a wider view over the area can be seen.

The aim to change people's lifestyle is a very large goal; it is then the idealistic undertone of it that makes it suitable for the project area. I already mentioned how food can influence people behaviour. But not only the program, also the design of the waterfront itself tries to change people's attitude. By using waste material of the area, transforming it, and giving a new function for it, people will be more aware of the value of reusing materials. They will also be taught, in a way, to use a certain object not only in the way it is or was mended to be, but let them think for themselves how it would be nice to use that relevant object. As a small example some bollards of the area are transformed into benches, located at the gathering places in the gardens. At this location it is obvious that you can use it as a sitting object. When they are walking the next moment along the sheet-piling quay, with the bollards along the waterside, and notice how beautiful the view over the river is, they may link the idea of the bollard as sitting object and will actually sit on it, while they usually would not have done that.

The area is open for new ideas from visitors. The stripped industrial shed for instance, can evoke the idea to transform them into a playground with car-tires as swings, and while the kids are swinging, the parents can enjoy the restful place along the waterfront showing the fluctuating tides.

As for the questions on the large scale, the answers are already discussed with the future vision. The aim is of course that the masterplan indeed evokes the development of a continuous waterfront along the Maas, showing the large scale of the harbour. When the project would be realised, a lot more interaction can be made with citizens, interested actors and other parties, in order to discuss the demands and wishes of them. Then the area will also develop itself in small steps, when a certain interventions evokes another, until the area will develop itself in a full functioning area. When however little steps are made, few activities extend itself, and not so much developments take place, then there is still always the waterfront, as open and public space, where you can experience the spirit of the former industrial harbour and overview the vista's on the Maas.
11. Notes, illustration list and Literature

11.1 Notes


11.2 Illustration list

Each drawing or photograph is created by the author of this thesis, unless mentioned in the following list:

Fig. 0.2 www.flickr.com
Fig. 1.3a-c http://www.nycgovparks.org/
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Fig. 5.5 varying internet sources
Fig. 6.4 www.landezine.com
Fig. 7.2 http://www.urenio.org/el/wp-content/uploads/2008/10/Shanghai-Greenport-Masterplan.pdf
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Food related:

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